# Clusters and Globalisation

## The Development of Urban and Regional Economies

*Edited by*

Christos Pitelis

*Judge Business School and CIBAM, University of Cambridge, UK*

Roger Sugden

*Birmingham Business School, University of Birmingham, UK and L'institute*

James R. Wilson

*Birmingham Business School, University of Birmingham, UK and L'institute*

IN ASSOCIATION WITH L'INSTITUTE (INSTITUTE FOR INDUSTRIAL DEVELOPMENT POLICY), UNIVERSITIES OF BIRMINGHAM (UK), FERRARA (ITALY) AND WISCONSIN–MILWAUKEE (USA)

**Edward Elgar**

Cheltenham, UK • Northampton, MA, USA

Published by
Edward Elgar Publishing Limited
Glensanda House
Montpellier Parade
Cheltenham
Glos GL50 1UA
UK

Edward Elgar Publishing, Inc.
136 West Street
Suite 202
Northampton
Massachusetts 01060
USA

A catalogue record for this book
is available from the British Library

**Library of Congress Cataloguing in Publication Data**
Clusters and globalisation : the development of urban and regional economies / edited by Christos Pitelis, Roger Sugden, James R. Wilson.
p. cm.
Edited papers from two workshops in Reus, Spain in 2003 and Toulouse, France in 2004. "[Published] in association with L'institute (Institute for Industrial Development Policy), Universities of Birmingham (UK), Ferrara (Italy), and Wisconsin-Milwaukee (USA)."
Includes bibliographical references.
1. Industrial location—Congresses. 2. Industrial districts—Congresses. 3. Regional economics—Congresses. 4. Globalization—Economic aspects—Congresses. 5. Economic development—Congresses. I. Pitelis, Christos. II. Sugden, Roger. III. Wilson, James R., 1976–

HC79.D5C58 2006
338.6'042—dc22

2005050162

ISBN-13: 978 1 84376 675 9
ISBN-10: 1 84376 675 2

Printed and bound in Great Britain by MPG Books Ltd, Bodmin, Cornwall

# Contents

# Contributors

**Mari Jose Aranguren**, Faculty of Economics and Business Administration (ESTE), University of Deusto, Spain

**Marco Bellandi**, Faculty of Economics, University of Florence, Italy

**J. Robert Branston**, School of Management, University of Bath, UK

**Lisa De Propris**, Birmingham Business School, University of Birmingham, UK

**Marco R. Di Tommaso**, Faculty of Economics, University of Ferrara, Italy

**Nigel Driffield**, Aston Business School, University of Aston, Birmingham, UK

**Claude Dupuy**, Research Laboratory for the Study of Economics, Politics and Social Systems (LEREPS), University of Toulouse I, France

**Jean-Pierre Gilly**, Research Laboratory for the Study of Economics, Politics and Social Systems (LEREPS), University of Toulouse I, France

**Nick Henry**, Centre for Urban and Regional Development Studies, University of Newcastle, UK

**Miren Larrea**, Faculty of Economics and Business Administration (ESTE), University of Deusto, Spain

**Itziar Navarro**, Faculty of Economics and Business Administration (ESTE), University of Deusto, Spain

**Daniele Paci**, Faculty of Economics, University of Ferrara, Italy

**Mario Davide Parrilli**, Birmingham Business School, University of Birmingham, UK

**Jacques Perrat**, Association for the Development of Economic and Social Studies in the Rhône–Alpes Region (ADEES), France

**Steven Pinch**, Department of Geography, University of Southampton, UK

**Christos Pitelis**, Judge Business School and CIBAM, University of Cambridge, UK

**Anastasia Pseiridis**, Department of Economics, University of Patras, Greece

**Valeria Pulignano**, Catholic University of Leuven, Belgium and University of Warwick, UK

**Miriam Quintana**, Lloyds-TSB Bank Plc, UK, formerly of Warwick Business School, University Warwick, UK

**Lauretta Rubini**, Faculty of Economics, University of Ferrara, Italy

**Silvia Sacchetti**, Faculty of Economics, University of Ferrara, Italy

**Stuart O. Schweitzer**, Department of Health Services, School of Public Health, University of California, Los Angeles (UCLA), USA

**Roger Sugden**, Birmingham Business School, University of Birmingham, UK

**Philip R. Tomlinson**, School of Management, University of Bath, UK

**André Torre**, Institut National Agronomique Paris–Grignon, France

**Ping Wei**, Birmingham Business School, University of Birmingham, UK

**James R. Wilson**, Birmingham Business School, University of Birmingham, UK

# Figures

# Tables

# Foreword: furthering the aims and objectives of L'institute

The activities that have resulted in this volume were undertaken under the auspices of L'institute (Institute for Industrial Development Policy), a joint venture sponsored by the Universities of Birmingham (UK), Ferrara (Italy) and Wisconsin–Milwaukee (USA), and designed to provide an institutional base for scholars throughout the world, no matter where they are otherwise employed. Established in 1997, L'institute aims to offer a particular type of focal point for the democratic empowerment of scholars (and others with an interest in the research and learning process). In this context, it seeks to evolve a multinational network amongst those thinking about and concerned with the development of economies. It also attempts to stimulate open, scholarly debate on, for example, the search for policies that recognise and foster locality-specific development goals in the context of 'globalisation'.

The preparation and publication of this volume contributes to the fulfilment of these aims and objectives in various respects. Not least, its subject matter goes to the heart of topical issues that are central to an understanding of processes of economic development and of corresponding policy requirements: the development of economies is strongly influenced by 'globalisation', analysis of which currently leads inexorably to a consideration of local economic processes and therefore of 'clusters'. More particularly, the volume is an explicit outcome both of the multinational networking that has been nurtured by L'institute, and of the attempts L'institute has made to stimulate debate on local economic development. Relatedly, it is a contribution to current and future networking and debate.

## THE DEMOCRATIC EMPOWERMENT OF SCHOLARS

L'institute is intended to give a stimulus to dynamic, multinational networking that goes beyond the confines of specific, self-contained projects, opening possibilities for more permanent scholarly interaction and cooperation. Moreover, by creating an organisation that sits firmly

within established universities, vital roots have been provided; they give networking a concrete presence, lifting it beyond comparatively short-run initiatives and abstract theorising.

We see the activities of L'institute as centred on its participants, most especially on the scholarship of the individual people contributing to its research and learning initiatives, rather than on the institutional objectives of the sponsoring universities. Correspondingly, its own (evolving) principles and statutes define L'institute. These are intended to foster positive freedom, openness and unique outputs by providing a minimal, democratic structure that empowers those who participate in its activities. These scholars are drawn from a far wider set of organisations than those that are the formal sponsors of L'institute. One aim is to enable and facilitate their engagement – among themselves, and with others concerned about processes of economic development and the design of public policy.

The emphasis on multinationalism implies a coming together across borders, a process based on and respecting the different experiences, histories, traditions and cultures of various localities. These differences are seen as a source of strength, providing opportunities for mutual benefit, and for identifying and pursuing efficient ways forward. As argued in Sugden (2003, 2004), the benefit of such multinationalism is seen to be in the quality of research and learning, in unique and otherwise unobtainable outputs.

## CLUSTERS AND GLOBALISATION

Among the specific initiatives pursued by L'institute has been a multinational project entitled 'The Importance of Clusters to Urban and Regional Prosperity in a Globalised Economy'. This project was coordinated jointly with the Centre for International Business and Management (CIBAM) (University of Cambridge, UK), the Universitat de Barcelona (Spain), the Universitat de Rovira Virgili (Spain) and the Université de Toulouse (France). Its origins lie in L'institute workshops held in Milwaukee (USA) in 2000 and 2001, which resulted in an edited volume focusing in part on 'clusters' as a potential 'solution' to problems of local economic development (Sugden et al., 2003). Building on this experience, the aim has been to learn from different perspectives on clusters and from various cases, in order to better understand clusters' varying consequences for economic activity, including performance and policy.

A result of the project is the chapters that comprise this volume. Each is an outcome of the multinational networking and of the attempt to stimulate debate on local economic development that so preoccupies the participants in L'institute. Not least, each has been variously debated at

dedicated, multinational workshops in Reus (Spain, in 2003) and Toulouse (France, in 2004). More than that, however, the volume is a contribution to current and future networking and debate, its chapters providing a basis for taking forward collaboration on these and related issues among interested scholars.

Indeed, in welcoming publication of this volume we are looking to the steps that will take the analysis and debate to the next level, continuing to learn from the experiences of the last few years. In particular, work on the current volume enables those of us who have been participating in the project to appreciate better our overlapping lines of research, to see where we are proceeding in parallel and where there might be opportunities for convergence. Similarly, it presents possibilities for the identification of new colleagues with common or complementary interests and concerns, and hence opportunities for them (and their associated universities) to join in (and sponsor) the activities of L'institute.

Moreover, we suggest that work on the project over the last few years has highlighted the need to design projects so as to encourage scholars to come together in their research, to feed off each other to mutual benefit and to improve the research outcomes. Specifically, this has prompted a search to identify particular hypotheses around which various lines of research can be pursued, facilitating their coherent amalgamation into a more effective output. It is with such a hypothesis-driven approach in mind that, for example, following the aforementioned workshop in Toulouse, a successful application was made to the European Science Foundation for an 'Exploratory Workshop on the Governance of Networks as a Determinant of Local Economic Development' (due to take place in San Sebastian, Spain, in November 2005).[1] Again infused with the aims and objectives of L'institute, this initiative is expected, among other concerns, to take up the analysis of clusters and globalisation, and to do so with inputs from some long-standing but also many new colleagues. Of course, its fruits must await future publications.

More subtly, preparation and publication of this volume figures prominently among the broad set of L'institute activities over recent years, and accordingly it has been influential on the more general evolution of L'institute as a particular type of academic enterprise. Dewey (1927, p. 250) observes that 'association in the sense of connection and combination is a "law" of everything known to exist. Singular things act, but they act together. Nothing has been discovered which acts in entire isolation. The action of everything is along with the action of other things.' In that spirit, the connection and combination between work on this volume and work on other projects and in other contexts has enabled many of those participating in L'institute to understand better their relationships; to appreciate ways in

which they might work together more effectively and to recognise different forms of joint outputs that might be attainable. In other words, work on the volume has contributed to learning about how best to realise democratic enablement in academic activities and, consistent within that, how best to optimise research and learning outcomes so as to accord with scholars' democratically determined aims.

Similarly, we hope the responses of readers to the volume, and the new ideas, debates and projects that they might stimulate will also contribute to the future evolution of L'institute.

Roger Sugden
James R. Wilson
April 2005

## NOTE

1. For further information, see www.esf.org.

## REFERENCES

Dewey, John (1927), *The Public and its Problems*, New York: Holt; page numbers refer to Boydston, Jo Ann (1988), *John Dewey. The Later Works Volume 2: 1925–1927*, Carbondale and Edwardsville: Southern Illinois University Press.

Sugden, Roger (2003), 'Internationalism and economic development: transnational corporations, small firm networking and universities', in Michael Waterson (ed.), *Competition, Monopoly and Corporate Governance: Essays in Honour of Keith Cowling*, Cheltenham: Edward Elgar.

Sugden, Roger (2004), 'A small firm approach to the internationalisation of universities: a multinational perspective', *Higher Education Quarterly*, **58** (2/3), 114–35.

Sugden, Roger, Hartung Cheng, Rita and Meadows, G. Richard (eds) (2003), *Urban and Regional Prosperity in a Globalised, New Economy*, Cheltenham: Edward Elgar.

# Acknowledgements

We would like to acknowledge all of the participants at the two workshops in Reus (Spain, in 2003) and Toulouse (France, in 2004) for their contribution to the development and evolution of the research contained in the volume. In particular, we would like to thank the local organising committees of these two workshops from the Universities of Rovira i Virgili, Barcelona and Toulouse, and L'institute's academic coordinator Marcela Valania for her role in overall coordination of the project.

Christos Pitelis
Roger Sugden
James R. Wilson

# 1. Introduction*

**Christos Pitelis, Roger Sugden and James R. Wilson**

## CLUSTERS AND GLOBALISATION: A RESEARCH AGENDA

The development of economies is increasingly influenced by the changing relationships associated with what is termed 'globalisation'. However, amidst these changes, which arguably remove the significance of many previous borders, the importance of understanding local development processes is enhanced. Indeed, while the significance of territory in general has been one of the many contested areas within debates surrounding globalisation (Hirst and Thompson, 1996; Ohmae, 1990, 1995; Radice, 2000; Ruigrok and Van Tulder, 1995; Scholte, 2000; Wade, 1996), it is widely acknowledged that 'localisation' of some form is central to the changes that are occurring. For example, Storper (1997), in his influential book, emphasises the key role of regional communities and firms as the basic building blocks of an increasingly connected world. Moreover, the wave of research in 'new economic geography' sparked by Krugman's (1991) seminal contribution has focused on the location of firms and factors determining the concentration of economic activity (Krugman, 1998; Fujita et al., 2001).[1] It follows that an understanding of the development of economies under globalisation requires analysis both of local economic processes and of their interaction in the changing global sphere of relationships.

When it comes to understanding local economic processes, there is a wide and varied body of research to draw on, spanning the disciplines of economics, geography and regional science, among others. A theme that runs through much of this literature, and that has gained particular prominence recently, is that of the role of 'clusters' of firms in local development processes. The clustering of firms as an economic phenomenon with the potential to provide an 'engine' for local development is by no means new, and is famously rooted in Marshall's (1907, 1919) analysis of 'industrial districts'. Recently, however, research into clusters, and more

generally networks of cooperation between firms, has flourished. Indeed, it has contributed to what Martin (1999) has termed a 'geographical turn' in economics, and, from a management perspective, is reflected in Dunning's (1997) label of 'alliance capitalism'.[2]

In particular, 'clustering' as an economic policy concern has become increasingly fashionable, stimulated especially by the success of the industrial districts of the so-called 'Third Italy' (Piore and Sabel, 1984; Pyke et al., 1990; Becattini, 1991; Dei Ottati, 1991; Becattini et al., 2003). Other successful experiences, whereby clusters of one form or another have been associated with productivity growth and/or employment creation, have fuelled this policy interest,[3] as has the influential work of Porter (1990, 1998) on competitive advantage. Indeed, a consequence is that there is currently a widely held view that 'clusters' are somehow fundamental for ensuring economic success for localities in a global economy. Policies to stimulate clusters are thus frequently perceived as desirable, *per se*, by those concerned with facilitating local economic development.

While it is refreshing and welcome that an academic concern with clusters has been able to infuse policy debate to such an extent, with notable policy impact in localities across the world, there is also cause for concern. A crucial problem arises in that the term 'cluster' embraces a potentially huge variety of very different forms of relationships, both among firms and between firms and other actors. Moreover, in the context of globalisation, these relationships are not confined to firms and actors in geographical proximity, but may span localities and nations in different ways. Thus while clusters are often pursued as a general solution to problems of local economic development, there is remarkably little understanding, and even less agreement, around what clusters are, what they require for success, and what impacts they are likely to imply in different contexts, locally, nationally and internationally.[4] This presents a clear rationale for a research agenda that seeks to bring together expertise from different fields in order to clarify understanding around the requirements and consequences of 'clusters', and for analysing rigorously the role that has been assumed for them in local economic development processes in the context of globalisation.

## THE ORIGINS AND PURPOSE OF THIS VOLUME

This volume is part of a wider research project that has been coordinated by L'institute (Universities of Birmingham, Ferrara and Wisconsin–Milwaukee), the Centre for International Business and Management (CIBAM) (University of Cambridge), the Universitat de Barcelona, the Universitat de Rovira i Virgili and the Université de Toulouse, and is

titled 'The Importance of Clusters to Urban and Regional Prosperity in a Globalised Economy'. The origins of the project lie in a series of two L'institute workshops that took place in Milwaukee, USA, during 2000 and 2001. The second of these workshops addressed the issue of 'Urban and Regional Prosperity in a Globalised Economy', and aimed to integrate the work and ideas of participating scholars with local development concerns within the state of Wisconsin. A volume was published containing the research of participants, alongside explicit analysis of the actual process of the workshop and a collective report commenting on the local development concerns that were identified and discussed (Sugden et al., 2003).

One local concern very evident during the workshop was the role of clusters in Wisconsin's economic development, linked in particular with a desire to create 'high-value' employment in the region (Sugden et al., 2003). In the four years since the workshop this concern has not subsided, and continues to dominate state-wide debate on economic development, as seen most explicitly in sessions at the periodic 'Wisconsin Economic Summit' and in the Wisconsin Department of Commerce's commitment to a state-wide cluster initiative. However, at the time of the workshop, debate focused substantially on the potential problems associated with adopting 'clusters' as a general solution to problems of local economic development, without thorough analysis of impacts and requirements (Sugden et al., 2003). The relevance of this for ongoing debate in Wisconsin, alongside the realisation that similar adoption of 'clusters' as a panacea for economic development ills was occurring in localities across the world, provided the impetus for a project dedicated to specifically analysing such issues.

The chapters presented in this volume are a result of that project. Based on the lessons of the L'institute–Milwaukee workshops, the overall aim of the project has been to learn from different perspectives on clusters and experiences with clusters, in order to understand better their varying consequences for economic activity, including performance and policy. The project was founded on a fundamental concern with locality-based development in a globalised economy, and has sought to integrate discussion and analysis on conceptual issues, experiences and impacts. In particular, it is clear that the label 'cluster' encompasses many different and varied types of production organisation, implying a danger that localities will attempt to appeal to clusters without appreciating this enormous variation. An objective has therefore been to consider conceptual arguments and case material from scholars with different perspectives and theoretical groundings, and, in doing so, to identify key characteristics and requirements of the forms of cluster that appear to be especially significant for the attainment of economic prosperity.

The chapters are an initial step towards achieving this objective. They have been variously debated and refined during special sessions at the 2002 and 2003 International Conferences of EUNIP (European Network on Industrial Policy) in Turku and Porto, respectively, and at two dedicated international workshops in Reus (2003) and Toulouse (2004). The research contained within the volume explores a range of key concerns at the heart of the analysis of clusters in a globalising economy, and in the remainder of this chapter we outline some of its contents.

## OVERVIEW OF CHAPTERS

The first two chapters are conceptual in nature, and their concern is to establish appropriate frameworks for the analysis of clusters in the context of their potential contribution to economic development amidst the forces of globalisation. Chapter 2, by Christos Pitelis and Anastasia Pseiridis, sets the scene by arguing that small firms, and in particular clusters of small firms, have been afforded insufficient attention in the economics literature. They aim to address this by developing a conceptual framework for the analysis of clusters of small firms, in particular with regard to their impact on productivity.

The first part of their chapter accordingly undertakes a detailed analysis of various literatures. Suggesting that recent and growing policy interest in clusters is rooted in diverse perspectives and/or is based on observation rather than theory, they critique the theoretical input that different strands of the economics literature might offer in understanding the potential significance of clusters. This brings them, in particular, to an analysis of industrial districts; rooted in the work of Marshall and carried forward by various other authors, this is a theme that is also reflected in other contributions throughout this volume.

From this foundation, the conceptual contribution of Pitelis and Pseiridis is twofold. First, they build on the seminal insights of Richardson, on cooperation, and Penrose, on the growth of the firm, to establish a framework for analysing clusters. The essence of their argument is that a cluster can be seen as an expanded (or quasi) Penrosean firm, whereby cooperation, as understood in a Richardsonean sense, can lead to Penrose-type effects within and across firms, increasing productivity. While the work of Richardson contributes towards understanding the circumstances under which cooperation will take place, Penrose's ideas are needed to identify how and when entrepreneurs are able to understand whether or not activities necessitate cooperation. Second, they pursue further the effects of cooperation and clusters on firm productivity by linking this framework

to the 'productivity–competitiveness wheel' developed by Pitelis (1998). Specifically, they show how clusters affect productivity with regard to their impacts on human resources, infrastructure, unit cost economies, technology and innovation, and institutional atmosphere.

The final part of the chapter then seeks to apply aspects of this conceptual framework to a cursory analysis of a specific cluster policy that has been implemented in Greece. The authors uncover a number of limitations to this programme, but suggest, on the whole, a positive impact. This supports their more general argument that industrial policies for the promotion of clusters are promising endeavours due to the alternative route that they provide for productivity and competitiveness.

In Chapter 3, Roger Sugden, Ping Wei and James R. Wilson develop a methodological framework for analysing clusters in the context of the development of local economies more generally. They begin in a similar way to Pitelis and Pseiridis, highlighting growing scepticism surrounding the conceptual, theoretical and empirical underpinnings of clusters as a solution to problems of local economic development. However, they argue that this is related, in part, to insufficient attention being afforded to analysing the relationships among actors within and across clusters, and the evolution of these relationships. Such inherently qualitative analysis is often overlooked as more obvious, quantitative, but arguably superficial, aspects of apparently successful clusters are highlighted. One result is an association between the term 'cluster' and allegedly favourable local economic outcomes, leading ultimately to the adoption of 'cluster' policies as a panacea for local development problems. An objective of the chapter is hence to pioneer an alternative approach, which seeks to recognise underlying qualitative relationships as determining likely success or failure for any given 'cluster'.

Defining 'cluster' very broadly, Sugden et al. build on a paper by J. Robert Branston, Lauretta Rubini, Silvia Sacchetti, Roger Sugden, Ping Wei and James R. Wilson (2003) (which is included as an Appendix to the chapter) in suggesting an analytical framework designed to explore the requirements and impacts of clusters. They take a strategic decision-making perspective, founded on an underlying theoretical argument that the governance of development processes plays a pivotal role in determining whether or not development meets the aims of those in a locality. Given the nature of clusters as being in some sense embedded in localities, their framework seeks to extend this theoretical concern to the analysis of clusters themselves. Understanding the governance of clusters, it is argued, is central to appreciating both their requirements and their potential impacts on the development of local economies. Moreover, such a focus requires a fundamentally multidisciplinary approach, something that is reflected in

the nature of their suggested methodology, which is taken up in part by the case analysis of Sacchetti and Tomlinson in Chapter 11 of this volume.

The next group of chapters is also conceptual in nature, but focuses on more specific issues – public goods, knowledge, foreign direct investment (FDI), territorial governance, trust – whose detailed analysis can provide valuable lessons for the potential roles and impacts of clusters with regard to local economic development. In Chapter 4, Marco Bellandi builds on previous research to consider first of all the analytical distinction between clusters, local production systems and industrial districts. He relates these three notions to the existence of goods with public characteristics, and to mechanisms for the governance of these goods. As regards clusters, the importance of public goods that are specific to the clusters' needs is emphasised, and a framework is introduced for analysing such specific public goods. In particular, specific public goods can be differentiated by their functions, territorial span, and the type and degree of public characteristics that they exhibit. A series of examples – from the development of information and communication technologies in clusters, to 'high-tech' clusters, to a case of bifurcation in the development of an evolving city – is then employed to illustrate and explore various issues surrounding the provision of specific public goods in different contexts.

Various implications for the characteristics and requirements of successful clusters can be drawn from this analysis. While the provision of specific public goods is clearly an important factor – clusters are indeed built on public goods – there are complex qualitative issues to consider. In particular, the balance of public goods exhibiting different degrees and types of public characteristics is argued to be of fundamental importance. At the same time, it is recognised that the appropriate balance changes both over time and with the specific character of the cluster/locality itself. Thus when thinking of clusters as a solution to problems of local development, we might want to be concerned with those that are capable of generating a context-specific, desirable balance of public goods. Moreover, policies that integrate various types of specific public goods, rather than separate policies, may be more consistent with such an outcome.

The next chapter (5), by Nick Henry and Steven Pinch, focuses on a specific subset of the potential productivity advantages that Pitelis and Psieridis attribute to clusters, those that pertain to the generation and diffusion of knowledge. Taking a perspective rooted in the geographical clustering of firms, the basis for their analysis is that a significant part of the gains from such clustering stems not from agglomeration economies or transaction cost reduction, but from the competitive advantages that firms can secure through gaining access to various types of knowledge. They acknowledge the conceptual and empirical problems that such an

observation raises, and seek to tackle such issues through the adoption of a knowledge-based view of clusters and economic performance.

After a critique of the debate surrounding clusters, which bears similarities to the arguments made in justification of the need for new conceptual frameworks in the earlier chapters by Pitelis and Psieridis and Sugden et al., Henry and Pinch set out a model of knowledge diffusion in geographically clustered firms. Their model moves beyond the common distinction between tacit and codifiable knowledge to embrace an analytical distinction between *component* and *architectural* knowledge. This is then used to generate new insights into the competitive advantage of certain clusters. They focus particularly on architectural knowledge (that relating to the organisation of an entire system, including component knowledge), arguing that this can develop at the cluster level as well as the firm level, and highlighting that the national system in which clusters sit can also play an important role in shaping such systems of knowledge. Their analysis of architectural knowledge draws specifically on a discussion of earlier qualitative research on the case of the motor sport industry cluster in the UK to illustrate and substantiate the core of their argument.

As discussed in their conclusions, there are important implications for cluster policy that arise from Henry and Pinch's chapter. While their analysis implies that architectural knowledge is likely to play a crucial role in determining the economic competitiveness of clusters, and hence their likely impacts on trajectories of local economic development, they are careful to acknowledge the methodological difficulties in thoroughly analysing such processes. Nevertheless their perspective on knowledge provides a valuable framework from which policy makers can evaluate what is happening within their clusters, what impacts clusters are having, and what potential exists for nurturing suitable ways forward. However, it should also be noted that they are keen to stress that clusters themselves are only one spatial expression of the new economic geography of urban and regional development. An implication is that we should take care in focusing all of our analysis on so-called 'clusters'.

In Chapter 6, Lisa De Propris and Nigel Driffield continue the emphasis on knowledge, but with the focus shifting to knowledge sourcing as a potential motivation for FDI in the context of clusters. In particular, they seek to draw insights from a fusion of two literatures that have traditionally remained separate; the firm-based economics literature on FDI and the regional science literature on indigenous clusters and local development. From this they suggest an alternative way of analysing the relationship between FDI and clusters. Whereas traditionally clusters have been seen as the outcome of FDI, De Propris and Driffield suggest that they can in fact be a precondition for the strategic attraction of quality FDI to particular localities.

The basis of their argument lies in the potential of clusters as centres of accumulated knowledge, something that is related to the significance of 'architectural knowledge' analysed by Henry and Pinch in the previous chapter. It is argued that realisation of the knowledge potential of clusters enhances the attractiveness of their localities for transnational firms, a contention that is supported by reference to the large FDI literature on spillovers, in particular with regard to recent research suggesting a knowledge-sourcing motivation for FDI. Crucially, basing the attractiveness of localities on clusters that are characterised by accumulated knowledge provides an alternative to seeking to attract FDI though cheap labour or other short-term incentives. In turn this opens the potential for longer-term and mutually beneficial FDI, avoiding the problems of transience and exploitation that are often levelled at FDI. Indeed, the analysis has particular implications for policies towards developing and supporting successful clusters. For example, it is suggested that UK cluster policy has been misguided in recent years, relying on FDI to create and sustain clusters rather than focusing on developing indigenous cluster advantages which can then attract high-quality FDI that is of long-term benefit to the cluster and locality.

Chapter 7, by Jean-Pierre Gilly and Jacques Perrat, examines a further set of conceptual issues that are central to understanding local development, and hence central to an appreciation of the roles that 'clusters' might play here. Their focus is on the economic and institutional interconnections between territorial and global dynamics, specifically the links between the different spatial scales at which economic systems are regulated. After presenting an analytical framework for the analysis of these issues, building on previous work, they consider how the relationship between local governance and global regulation functions today, in an era marked by changes in the exercise and transmission of power and authority. Indeed, the existence of such 'globalisation' highlights the especial importance of the interface between local governance processes and global governance processes.

The chapter contains notable warnings regarding the dominance of certain players and the purely financial logic that many players currently pursue, something the authors suggest has increased polarisation and reinforced spatial inequality. They also warn against global governance predetermining local governance, highlighting a need to guard against such tendencies. In this regard, their analysis again provides pointers for how we analyse clusters, and the potential impacts that they may have. A clear implication, for example, is that clusters may be an important mechanism for redressing this balance between local and global governance. However, following the arguments of Sugden et al. and Sacchetti and Tomlinson, this might only be realised if appropriate attention is afforded to the nature of

governance processes within clusters, and between clusters and other, local and global, actors.

A key aspect that emerges explicitly throughout the first five contributions, and implicitly in the case of the chapter by Gilly and Perrat, is the significance of so-called 'trust' relationships for the successful development and operation of clusters. Appropriately, therefore, trust, confidence and their interaction with proximity are the detailed focus of the next chapter (8), by Claude Dupuy and André Torre.

They present a sophisticated framework for understanding the concepts of trust and confidence that generates a number of interesting distinctions and insights. The chapter is based around a theoretical discussion of the nature and evolution of trust relationships, which are ultimately founded on the presence of uncertainty. In particular, an important distinction emerges between *interpersonal confidence* and *community confidence*. Interpersonal confidence concerns 'rational' interaction between individuals, where trust is acquired through mutual commitments based on face-to-face relationships in the pursuit of private gain. Community confidence, on the other hand, is related to 'blind trust' and centres on the ability of individuals to embed themselves in a social system, the relationship of trust resting on the reputation of the community as a whole. The former is characterised as being *undersocialised* and the latter as *oversocialised*, which, it is argued, renders them inadequate for covering the whole spectrum of relations of proximity. This leads to consideration of a third distinction, *hierarchical confidence*, a more organised form that is defined in terms of relationships with the institutions that govern the rules of the game.

These distinctions, and the theoretical discussion around them, provide the basis for understanding a number of dynamics that are potentially important for analysing local systems of production, including clusters. Different levels and types of trust are discussed, for example, leading to an appreciation of the phenomena of cycles of euphoria or overconfidence, and, inversely, crises in confidence. The risks of opportunism and conflict in interpersonal relationships are also analysed, providing a rationale for the institutionalisation of rules as reflected in hierarchical forms of confidence. Finally, the relationship between spatial proximity and different forms of confidence is analysed, leading to a conclusion that commitments are more easily reversible in trust relationships based on hierarchical confidence where proximity plays a lesser role. Such analysis implicitly provokes questions about the balance of different forms of confidence that are likely to be desirable for spatially bound clusters, and also potentially for clusters that are not spatially bound.

The next group of chapters presents a slight shift in the analytical focus. While they are also concerned with conceptual issues that can generate

insight into the role and impact of clusters with regard to local economic development, they pay particular attention to fusing conceptual analysis with specific case experiences in building relevant insights.

Chapter 9, by Miriam Quintana and Valeria Pulignano, addresses an often ignored factor in the analysis of clusters – the significance of employment relations. They suggest that the nature of the employment relationship can be expected to be extremely important for the success of firms in clusters, as these firms are highly dependent on the social context in which they are embedded. The authors analyse the scarce literature in this area, drawing attention to the conflict between the potential that clusters provide for greater face-to-face interaction between employer and employee, and the enhanced scope for paternalistic and authoritarian practices that a lack of formal regulation might imply. This is reflected, they argue, in apparently divergent views of the nature and quality of the employment relationship in industrial districts and, by extension, clusters.

The authors discuss various factors that can shape employment relations in a cluster context. They focus in particular on two broad issues: first, the location of the cluster, something that can be associated with a whole range of factors such as the presence and role of organised labour and the institutional and regulatory framework; and, second, the size of firms in the cluster, in turn related to the power relationships and dependencies/interdependencies. These issues are explored with reference to a particular case analysis of Fiat in Italy, a supply network where employment relationships have evolved in a particular way as a consequence of both the location of the cluster, hence institutional setting, and the nature of firm interdependencies implied by the adoption of new management techniques. This case illustrates both the potential significance of employment relations for the successful operation of clusters, and also the role that cluster relationships of certain forms might play in influencing the evolution of employment relations practices.

There is change of focus in Chapter 10, where Mario Davide Parrilli examines a specific type of cluster often observed in less developed countries, the so-called 'survival clusters'.[5] He presents a case for optimism regarding the development prospects for such clusters, confounding the predominantly pessimistic assumption that their economic performance has a tendency to stagnate.

The first part of Parrilli's chapter discusses a theoretical framework based around two complementary hypotheses. The first posits that 'clustering is beautiful' precisely because all kinds of clusters have the potential to grow. This argument is rooted in a 'stage' approach that transforms Brusco's (1990) four historic models of Italian local production systems into a sequence of stages that Italian industrial districts passed through in their trajectory of growth. Thus so-called 'survival clusters', it is argued, may

resemble earlier stages of industrial districts, representing a reality with interesting potential to grow and evolve with time, and one which merits further investigation. The second hypothesis then draws on key strands of the literature surrounding clusters to suggest that the growth of clusters depends on three types of factors: collective efficiency, social embeddedness and policy inducement.

Combining these two hypotheses, the second part of the chapter examines empirical evidence from Costa Rica and Nicaragua on two furniture clusters whose performance by conventional indicators puts them in the category of 'survival clusters'. Parrilli finds, however, that this disguises considerable dynamism, certainly in the Costa Rican case, and to a lesser extent in the Nicaraguan case. This means that they may in fact be comparable with the clusters in advanced economies, which are today considered 'competitive', in their first stage of development. Moreover, the evidence seems to confirm the value of adopting an eclectic approach capable of understanding the diverse and complex interrelationships that underlie potentially successful clusters. Indeed, in line with much of the conceptual work of earlier chapters, an implication is that it is important to look behind superficial characteristics to analyse the production of relationships, trust, public goods and so on in examining the potential for successful clusters. It is in this context that appropriate policy support is likely to be identified and pursued.

In Chapter 11, Silvia Sacchetti and Philip R. Tomlinson draw implications that are related to those of Parrilli, but from an analysis of two very different cluster cases. Their focus is the challenges posed to two of Europe's oldest and most established industrial clusters by globalisation and increasing international competition. They adopt a strategic decision-making approach to cluster analysis that is rooted in an application of the methodological framework set out by Sugden et al. in Chapter 3; it considers an understanding of cluster governance structures to be crucial in analysing their impacts and, consequently, their policy requirements.

The chapter is essentially split into two in-depth case analyses, followed by a concluding section. The first case to be considered is that of the North Staffordshire ceramics industry in the UK, which was established since the late seventeenth century, and the second is that of the Prato textile industrial district in Italy, which has an even longer history, dating back to the twelfth century. It is clear from the analysis, however, that the future of both of these traditional clusters has become increasingly uncertain in the context of globalisation and its accompanying trends. In turn this has stimulated processes of restructuring in each of the clusters, something that has in both cases altered governance structures. It is these changes in governance, their implications, and the corresponding possibilities for future developments that are the focus of analysis in the chapter.

A number of interesting conclusions emerge from Sacchetti and Tomlinson's analysis. For example, they identify specific lessons that each of the clusters can learn from each other's experiences. They argue, for example, that the future of the ceramics cluster in Staffordshire depends on greater cooperation and networking among actors, in part a return to a previous 'stage' of the cluster's development, where the structure was characterised by smaller-scale production units. In this they have much to learn from the earlier development of Prato's small-firm sector. Similarly, given the path of production consolidation to which the Prato cluster currently appears drawn, it can learn from the failures of the merger wave that swept through Staffordshire in the 1960s. Indeed, such arguments provide an interesting extension to the 'stages' approach developed in the previous chapter by Parrilli; in the case of mature clusters, it appears that there can be 'stages too far'. Overall, the central implications from the chapter's analysis are that clusters such as these need to find ways to retain a significant degree of strategic decision making within the locality, and, alongside this, to encourage a positive role for networks, institutions and public research units in ensuring an innovative 'high road' to the development of activities.

Chapter 12, by Mari Jose Aranguren, Miren Larrea and Itziar Navarro, focuses specifically on the policy process itself. Arguing that real integration of clusters and networks into policy making has been far from achieved, they conduct an analysis of actual policy evolution and implementation in the Basque Country in Spain. Following an introduction to the specific case context, their chapter is split in two, reflecting the two separate cluster/network oriented policies that have coexisted in the Basque Country for the last 15–20 years.

The first of these is the cluster policy of the Basque government, which began at the start of the 1990s, essentially applying Porter's (1990) concept of cluster. They describe the evolution of policy, initiated in a top–down manner, and the emergent Basque clusters. They then use a series of observations drawn from various prominent case-based cluster studies as benchmarks from which to evaluate the Basque policy process. Their primary conclusion is that the policy has succeeded in generating cooperative opportunities among different Basque agents in strategic areas, but that there remain unresolved issues around evaluation of the impact of cluster activities on competitiveness, a stated mission of the project. In contrast to the top–down 'cluster policy', a second stream of cluster-oriented policies is then identified and analysed with regard to the Basque local development agencies. Describing a much more organic process, it is argued that these agencies have evolved a bottom–up model of support that has roots in Marshallian systems, but that crosses territories through a loose networking of agencies. An identified challenge, however, is to reinforce their role in stirring local agents into action within their territories.

It is the contrasting of these two distinct policy processes – one directly influenced by Porter, the other indirectly based around the ideas of Marshall – in the same territory that is most interesting, and the operation of policy at different territorial scales potentially opens up many of the issues/tensions that concern Gilly and Perrat, for example. Moreover, given the argued successes stemming from both models, an implication from this analysis is that there is more than one way to conceive of, and therefore provide policy support for, clusters.

In the next chapter (13), by Marco R. Di Tommaso, Daniele Paci, Lauretta Rubini and Stuart O. Schweitzer, the policy theme is continued, but the analysis focuses on a specific type of cluster, those that are characterised as 'high-tech', and in particular on the case of the biotech industry. This contrasts with the earlier analysis of 'survival clusters' provided by Parrilli, and complements the knowledge-based framework for analysing clusters set out by Henry and Pinch.

After introducing the significance of the analysis of clusters, industrial districts and networks, Di Tommaso et al. turn their attention to the specific theme of industrial concentration in high-tech industries. They argue that the traditional concept of agglomeration economies must be rewritten in the case of the emerging industries of the high-tech economy, focusing on three specific characteristics of such industries: their reliance on R&D and knowledge; the role that innovation plays as a core process in such industries; and the fact that production activity tends to be characterised by high levels of risk and uncertainty. Analysis of these three features then leads into an exploration of the particular case of biotech clusters, offering a discussion of localisation and agglomeration dynamics as alternative explanations for clustering in this industry, and a brief comparison of different models of biotech clusters that can be found in the USA, the UK and France.

The chapter concludes with reflection on the implications of the analysis for public policy and private collective strategy. Recognising the importance of such high-tech clusters, especially for the industrialised countries, the authors conclude that industrial policy in this area should focus on a number of issues: local public goods, internal relations, transactions costs, and external relations. Indeed, their conclusions have synergies with much of the analysis elsewhere in the volume, for example the contributions by Bellandi, Pitelis and Psieridis, and Henry and Pinch.

## FURTHER RESEARCH

As we have described, this volume is a result of a research project which has sought to analyse the importance of clusters for urban and regional

development in a globalised economy. It has done so by bringing together scholars with different perspectives and theoretical groundings, indeed from different disciplines, to debate a range of conceptual ideas and cases. The chapters in the volume reflect this process, and offer a collection of research that contributes significantly to the analysis of clusters in the context of globalisation.

We hope that the analysis contained in the following chapters will stimulate further academic debate in a field that is crucial for understanding processes of local economic development, and that such debate might lead to future projects and further research, building on the insights contributed herein.

## NOTES

* We are grateful to Jean-Pierre Gilly for comments on an earlier draft of this chapter.

1. This surge of interest is also reflected in the French school on the economics of proximity; see, for example, Gilly and Torre (2000).
2. See also de Rond (2003), Child and Faulkner (1998) and Nohria and Eccles (1992) for other important contributions to the management literature on inter-firm cooperation.
3. See, for example, among many others: Saxenian (1994) on the experiences of 'Silicon Valley' and 'Route 128' in the USA; Sabel et al. (1989) on the Baden-Württemberg region of Germany; Putterman (1997) on the experience of 'Town and Village Enterprises' in China; and Schmitz and Musyck (1994) on the lessons that various European experiences with clusters might hold for developing countries.
4. Indeed, Martin and Sunley (2003) have made the case that there is currently a 'chaotic' use of the term 'cluster' amidst fundamental conceptual, theoretical and empirical questions surrounding its validity for shaping development policy.
5. Parrilli (Ch. 10) defines 'survival clusters' as 'local systems composed of many craft producers working independently from one another (i.e. no division and specialization of labor) and elaborating individual products of rather low quality (due to little use of machinery) for the low-income segment of local consumers'.

## REFERENCES

Becattini, G. (1991), 'Italian industrial districts: problems and perspectives', *International Studies of Management and Organization*, **21**(1), 83–90.

Beccatini, G., Bellandi, M., Dei Ottati, G. and Sforzi, F. (2003), *From Industrial Districts to Local Development: An Itinerary of Research*, Cheltenham: Edward Elgar.

Branston, J.R., Rubini, I., Sacchetti, S., Sugden, R., Wei, P. and Wilson, J.R. (2003), 'The development of local economies and the possible impact of public policy: a framework for case studies', L'institute Discussion Paper No. 20.

Brusco, S. (1990), 'The idea of industrial districts', in F. Pyke, G. Becattini and W. Sengenberger (eds), *Industrial Districts and inter-firm cooperation in Italy*, Geneva: International Institute for Labour Studies.

Child, J. and Faulkner, D. (1998), *Strategies of Cooperation: Managing Alliances, Networks and Joint Ventures*, Oxford: Oxford University Press.

Dei Ottati, G. (1991). 'The economic base of diffuse industrialization', *International Studies of Management and Organization*, **21**(1), 53–74.
Dunning, J.H. (1997), *Alliance Capitalism and Global Business*, London: Routledge.
Fujita, M., Krugman, P. and Venables, A.J. (2001), *The Spatial Economy: Cities, Regions and International Trade*, Cambridge, MA: MIT Press.
Gilly, J.-P. and Torre A. (eds) (2000), *Dynamiques de proximité*, Paris: L'Harmattan.
Hirst, P. and Thompson, G. (1996), *Globalization in Question*, Cambridge: Polity Press (2nd edn 1999).
Krugman, P. (1991), 'Increasing returns and economic geography', *Journal of Political Economy*, **99**(3), 483–99.
Krugman, P. (1998), 'What's new about the new economic geography', *Oxford Review of Economic Policy*, **14**(2), 7–17.
Marshall, A. (1907), *Principles of Economics*, London: Macmillan.
Marshall, A. (1919), *Industry and Trade*, London: Macmillan.
Martin, R. (1999), 'The new "geographical turn" in economics: some critical reflections', *Cambridge Journal of Economics*, **23**, 65–91.
Martin, R. and Sunley, P. (2003), 'Deconstructing clusters: chaotic concept or policy panacea?', *Journal of Economic Geography*, **3**, 5–35.
Nohria, N. and Eccles, R.G. (eds) (1992), *Networks and Organizations*, Boston, MA: Harvard Business School Press.
Ohmae, K. (1990), *The Borderless World*, New York: HarperCollins.
Ohmae, K. (1995), *The End of the Nation State: The Rise of Regional Economies*, London: HarperCollins.
Piore, M.J. and Sabel, C.F. (1984), *The Second Industrial Divide: Possibilities for Prosperity*, New York: Basic Books.
Porter, M. (1990), *The Competitive Advantage of Nations*, New York: Free Press.
Porter, M. (1998), 'Clusters and the new economics of competition', *Harvard Business Review*, **76**(6), 77–91.
Putterman, L. (1997), 'On the past and future of China's township and village-owned enterprises', *World Development*, **25**(10), 1639–55.
Pyke, F., Becattini, G. and Sengenberger, W. (1990), *Industrial Districts and Inter-firm Cooperation in Italy*, Geneva: International Institute for Labour Studies.
Radice, H. (2000), 'Responses to globalisation: a critique of progressive nationalism', *New Political Economy*, **5**(1), 5–19.
de Rond, M. (2003), *Strategic Alliances as Social Facts: Business, Biotechnology, and Intellectual History*, Cambridge: Cambridge University Press.
Ruigrok, W. and Van Tulder, R. (1995), *The Logic of International Restructuring*, London: Routledge.
Sabel, C., Herrigel, G., Deeg, R. and Kazis, R. (1989), 'Regional prosperities compared: Massachusetts and Baden-Würrtemberg in the 1980s', *Economy and Society*, **18**, 374–404.
Saxenian, A. (1994), *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*, Cambridge, MA: Harvard University Press.
Schmitz, H. and Musyck, B. (1994), 'Industrial districts in Europe: policy lessons for developing countries', *World Development*, **22**(6), 889–910.
Scholte, J.A. (2000), *Globalization: A Critical Introduction*, Basingstoke: Palgrave.
Storper, M. (1997), *The Regional World: Territorial Development in a Global Economy*, London: Guildford Press.

Sugden, R., Hartung Cheng, R. and Meadows, G.R. (eds) (2003), *Urban and Regional Prosperity in a Globalised, New Economy*, Cheltenham: Edward Elgar.

Wade, R. (1996), 'Globalization and its limits: reports of the death of the national economy are greatly exaggerated', in S. Berger and R. Dore (eds), *National Diversity and Global Capitalism*, London: Cornell University Press.

# 2. A conceptual framework for firm cooperation and clusters, and their impact on productivity*

**Christos Pitelis and Anastasia Pseiridis**

## 1 INTRODUCTION

In this chapter we will attempt to develop a conceptual framework for clusters of SMEs, mainly based on the insights of Penrose and Richardson. Building on this framework, we will then move on to examine the effect of clusters on competitiveness, and we will 'test' our ideas in the context of a country-wide project aimed to support the creation of clusters in Greece.

## 2 SMALL FIRMS AND CLUSTERS IN THEORY AND PRACTICE

Small firms, including clusters of small firms, have recently been given an increasing share of attention in the economics literature. However, despite attempts to provide a theoretical backing for policies focusing on small and medium-sized enterprises (SMEs) and clusters, there is still scope for attempting to provide an integrative conceptual framework to inform and/or improve policy on SMEs and SME clusters. In what follows we will attempt to sketch the basis for an integrative conceptual framework on clusters of SMEs (and importantly the inner workings of clusters), mainly based on Richardsonian and Penrosean insights.

We begin with a general discussion of SMEs and clusters. SMEs are usually defined according to the number of employees, although there are countries which also take into account some financial indicators, the sector of activity, and/or the percentage of shares held by other enterprises.[1] However defined, there are considerable differences among SMEs. There are differences in, among others, their market reach (local vs national vs international); the 'atmosphere' within which they operate (declining

regions vs innovative and continuously improving regions); and the state of technology and product life-cycle (traditional sectors/saturated markets vs high-tech/fast-changing sectors).

What accounts for SME size? You (1995) is one of very few providing a survey of small firms in economic theory as an attempt to pinpoint the basis of a theory of the determinants of (small) firm size. He suggests that available neoclassical, transaction costs, industrial organisation and evolutionary models each provide useful insights on the determinants of size and the size distributions of firms in an industry or an economy, and also on inter- and intra-country differences.

Based on insights from all these models, You (1995) proposes seven factors that would account for small size and, consequently, the growth of the small firm sector in an economy.

1. *A structural effect*. That is, deindustrialisation or expansion of the service sector may result in a large share of small firms in an economy.
2. *A macroeconomic effect*. That is, the small-firm sector is more likely to expand during economic downturns.
3. *A change in technology*. A reduction of the necessary minimum efficient scale, or the reduction of asset specificities (dedicated assets), will tend to favour smaller firm size.
4. *A change in the market environment*. For example, an increase in uncertainty facing firms will increase returns to flexibility, and thus (as small firms tend to be more flexible) will increase the share of small firms in an economy.
5. *A change in the factor markets*. The small-firm sector will increase with an increase in available funding or finance.
6. *A change in tastes*. That is, a shift of demand towards more sophisticated products will increase the available 'interstices' for small firms in the economy.
7. *A change in the strategies of large firms*. For example, high pricing strategies or restructuring of firms increase the available 'interstices' in the economy for small firms.

You, however, fails to consider transaction costs and/or resource-competence-related factors, which may also be of relevance; see below. Policy interest in SMEs can be more fully explained by considering the advantages associated with small firm size. To name but a few, small firm size is associated with increased flexibility within the economy.[2] Small firms are considered more suited to meet continuously changing demand conditions. SMEs have been associated with the potential for increased innovativeness. They also account for a large amount of total employment in the economy. They may also

provide a seedbed for the creation of larger firms in the future.[3] Further, small firm size allows a more democratic process of decision making by firms and avoids the problems of practices exercised by larger corporations (e.g. divide-and-rule practices, abuse of market power); see Pseiridis (2001) for an extensive account.[4] Deindustrialisation processes, taking place especially in countries mainly dominated by large (multinational) corporations, such as the UK and the USA, and the emergence of 'new competition' (Best, 1990), may question the long-term prospects of development based on a focus on large (multinational) firms.[5]

The above helps explain why policies with regard to SMEs, cooperation and clusters have recently become an essential part of an industrial development agenda, notably within the EU. However, arguments in support of SMEs, and especially clusters of SMEs, are still rather impressionistic; they do not derive from a coherent conceptual framework.

In what follows we will attempt to point out relevant difficulties in relying on traditional economic theory for the creation of a conceptual framework for clusters.[6]

First, mainstream neoclassical theory does not seem to accommodate positive insights/connotations on firm cooperation and clusters other than cooperation as collusion. Industrial organisation (IO) literature is basically concerned with market power (and the associated monopoly profit) and strategies of incumbent firms in imperfectly competitive market structures to maintain that power. It is less concerned with the process of jointly setting and improving conditions for efficient production or for effective innovation-led profitability and growth.

Interestingly, there are some seeds for a conceptual framework on inter-firm cooperation in the transaction costs approach. In Williamson (1975), for example, there are four alternative ways (governance modes) of efficiently organising/coordinating transactions: the firm (unified governance), cooperation (contractual governance or 'promise'), planning, or market. The nature of each transaction defines the appropriate (most efficient) governance mode. Thus when opportunism is absent, inter-firm cooperation emerges as the appropriate firm choice, and trust gains importance as a determinant of mutual firm success.[7]

Importantly, some SMEs seem to operate alone (i.e. carrying out the full set of activities needed for the production of their 'final' product), while others may be linked, by one way of cooperation or another, with other, small or large, firms, effectively being a part of a coordinated chain of activities, in some cases also providing some or all of the coordination needed for the production of a 'final' product. Researchers seem to acknowledge that horizontal or vertical linkages between firms and the existence of collocated 'neighbouring' sectors are important contributing factors to firm and

regional competitiveness; see, for example, Porter (1990, 1998a, 1998b), Pouder and St John (1996), Tallman et al. (2004), Inkpen and Tsang (2005). This idea has spilled over to the policy makers. Thus support for SMEs has been extended, especially during the 1990s, to encompass support for the creation of linkages and agglomerations of (mainly) SMEs, as a way of creating and maintaining competitive advantage for participating firms and regions.

Various terms and definitions have been used to describe this phenomenon of agglomerations of interlinked firms (e.g. clusters, industrial districts, innovative milieux, etc.). Each of them seems to provide interesting insights on specific aspects of this phenomenon. Here we adopt the term 'clusters', in the following definition, which we believe embraces all the elements that are important for our description and analysis:

> Clusters are agglomerations of firms in a particular activity, usually with a geographical dimension, with horizontal and (preferably also) vertical intra- and (preferably) inter-sectoral linkages in the context of a facilitatory socio-institutional setting, which co-operate and compete (co-opete) in (inter)national markets. (Pitelis, 2001, p. 2)

The potential advantages of clusters *vis-à-vis* larger firms has been the object of inquiry of several researchers. This body of literature dates back to Marshall (1920) and especially his treatment of the industrial districts and the industrial 'atmosphere'.

Marshall examined industrial districts as geographically defined (localised) socio-economic systems of production, mainly made up of (specialised) SMEs. It is not necessary that the district has a single specialisation; indeed the existence of multiple fields of specialisation can be essential in living through crises as well as an engine for progress. Most importantly, successful industrial districts have, by virtue of their openness and adaptability, the ability to renew their knowledge base, and thus maintain high growth rates.

Marshall viewed the industrial district as greater than the sum of its parts, and highlighted increased specialisation, external economies and collective efficiency as factors conducive to the industrial district's growth. These factors give the district the ability to compete with other forms of (big business) industrial systems. Of central importance to the district's growth are tacit knowledge (which is aided by the type of organisation), interaction of humans, firm flexibility and also social factors, such as the 'local spirit' (1920, Book I, ch. 2, p. 20), industrial atmosphere, need for peer recognition, and so on. In sum, industrial districts, favoured by the existence of external economies and accommodating interactive and cumulative innovation processes, may constitute an efficient industrial structure. Marshall, however,

did not fail to highlight the possible threats to the growth of an industrial district, especially the risk of institutional inertia, which may be inherent in a district, and prevent the district from continuously adapting to new activities, innovating, outliving radical changes, and generally anticipating the future.

Following a long silence, the academic community rose to the challenge of clusters. Bagnasco (1977) was arguably the first of a series of researchers who attempted to cast light on industrial districts in north-central and north-east Italy as veritable industrial structures.[8] Becattini (1979) highlighted a shift of emphasis from industrial sectors to industrial districts (often comprising more than one industrial sector) as units of analysis.

Many contributions thereafter centred on describing and explaining the Italian paradigm of industrial district. Industrial districts in the Third Italy cover product areas as diverse as clothing and footwear, ceramic tiles and automated packaging machinery. Of the most extensively analysed regions is Emilia-Romagna, especially because it has the highest per capita income in the whole of Italy, and an extremely small firm size (average of about five workers per firm); see Brusco (1982), Brusco and Righi (1989) and Lazerson (1990), among others.

However, industrial districts of various types abound in much of the industrialised world as well. In almost every part of the world there is a history of rise (and sometimes decline) of industrial structures similar to the Italian industrial districts. The USA, the UK, Denmark, France, Germany, Portugal, Spain and also Brazil, India and elsewhere feature notable examples; see, among others, Piore and Sabel (1984), Sabel and Zeitlin (1985), Schmitz and Musyck (1994) and Pseiridis (2001).

All the above provided extensive descriptions, analyses, typologies, and/or classifications of various observed forms of clusters in various countries. This trend has been embraced by the neoclassical camp as well, with the most notable contributions those featuring a focus on location economics and economic geography (see, e.g., Krugman, 1991, 1998a, 1998b; Audretsch, 1998).

Many typologies of industrial districts have been suggested. One of the most influential has been Piore and Sabel (1984), who examine industrial districts of the nineteenth and early twentieth centuries and argue that these districts shared three mutually dependent characteristics. First, they produced a highly differentiated range of products for regional and/or foreign markets, and they also engaged in constant alteration of their products, partly in response to changing market tastes, partly to shape market tastes and create new markets. Second, the technology employed by firms in these industrial districts could be used in various ways and for various products. Apart from the development and the efficient introduction

of new technologies, these districts' vitality has also been reflected in the 'speed and sophistication with which they adapted power sources to their needs' (1984, p. 31). Third, in these districts, and in order to encourage permanent innovation, regional institutions were created aimed at balancing competition and cooperation between firms.[9]

Despite the mass adoption of mass production principles by governments after the Second World War, Piore and Sabel argue that 'flexible specialisation' could re-emerge in our times (1984, p. 282), and suggest it as a way to deal with economic downturns, unemployment and slow growth. In summary, they link the growing needs for specialised and customised products to the need for the adoption of more flexible production practices, highlighting industrial districts as a vital carrier of this flexibility.

Other researchers attempt to give an explanation of clusters emphasising knowledge and learning that takes place within them. Malmberg and Maskell (1997), among others, suggest that clusters emerge as a response to increasing demand for rapid knowledge transfer between firms.[10] Maskell and Lorenzen (2004) and Tallman et al. (2004) argue that clusters are suitable for the creation, transfer and usage of knowledge. Rosenfeld (1997) emphasises a cluster's dynamic intangible characteristics, that is, flows of information, knowledge and innovation, as well as the importance of its social capital in enabling it to remain competitive through adaptation and diversification. Porter (1998a) argues that (local) clusters provide unique knowledge, relationships and motivation in a globalised economy, and many more features that boost productivity and enhance competitiveness.

One of the basic themes running through the above literature has been that industrial districts seem to both contain and generate industrial dynamism, and are suggested as alternative paths to sustained growth (see, among others, Sengenberger et al., 1990; Best, 1990; Pyke and Sengenberger, 1992). Further, as many types of industrial districts appear to be viable examples of development hubs in less developed countries as well, the benefits of creating or maintaining industrial districts is thus emphasised as a major objective of industrial policy (Schmitz, 1990a, 1990b; Schmitz and Musyck, 1994).[11] As a result, policies for the promotion of industrial districts have been proposed, both for developing countries and other less favoured regions (Brusco, 1990). An interesting issue is now how the state can, through its policies or actions, support the creation or enhancement of SMEs and clusters.

Brusco and Righi (1989) highlight the role of local government, industrial policy and social consensus for the development of industrial districts. An array of possible roles and actions of the public sector is highlighted. A non-exhaustive list includes vocational training, the provision of real services, and business counselling (e.g. Brusco, 1992; Brusco and Bigarelli,

1997); consent and constructive partnership of state and private sector at local and national level (e.g. Hirst and Zeitlin, 1989); the promotion of trust and inter-firm relations (e.g. Humphrey and Schmitz, 1998).

Best (1990) is a considerable contribution, setting this flourishing literature in the context of an emerging type of competition which calls for appropriate industrial policies. He defines 'new competition' as a novel form of competition, based on, and linked to, market-shaping activities as opposed to market-reacting responses. He suggests that the 'new competition' can be distinguished from the 'old competition' along four dimensions (Best, 1990, p. 11).

- *The organisation of the firm*. The firm in 'new competition' is a collective entrepreneur more like Schumpeter's entrepreneurial firm than the hierarchically structured firm of Chandler and Williamson. Such a firm is characterised by a strategic orientation, Schumpeterian innovation (i.e. innovation in process, products or organisation), organisational flexibility, the promotion and use of collective knowledge, a more flexible organisation of production, an organisational culture of learning and thinking, and the incorporation of learning by doing into improved ways of doing.
- *The coordination across the production chain ('consultative coordination')*. The 'new competition' can be best explained and described as an environment of consultative coordination between firms along the production chain. The firms are mutually interdependent in that sharing problem solving at a time of rapid technological change gives a competitive lead to all firms in the chain. Further, each of the firms, by specialising in a distinct phase of the same production chain, adds to the problem-solving potential of the whole system. However, this consultative (non-market) coordination does not rule out competition. Rather, competition is alive and encouraged between firms but by virtue of a long-term relationship of mutual trust and responsibility, which is ensured by specific social arrangements and norms.
- *The 'sector': competition and cooperation*. 'New competition' gives a different meaning to the industrial sector as well. The sector does not consist of identical firms producing homogeneous products and competing on price, as in neoclassical economics. Rather, the sector comprises a variety of interdependent firms (each one specialising in a distinct phase of the production chain) and inter-firm practices. Further, the sector comprises extra-firm agencies (such as trade associations, training programmes, joint facilities for R&D and marketing, etc.) and regulatory bodies, all of which aim at promoting and facilitating inter-firm cooperation. Seen in this light, firms in a sector not only

compete, but they can also collectively act to shape 'the rules of the game' for all the firms, that is, shape a sector strategy. The challenge is in establishing 'means of cooperation that generate common benefits to the firms involved and the *local economy*, without the stifling effects presupposed by the conventional view' (1990, p. 18).

- *The government and strategic industrial policy*. Finally, indispensable for the 'new competition' is the task of industrial (including antitrust) policy. Given the cooperative and competitive nature of firms' relationships under 'new competition', industrial policy has to administer a paradox, that is, to promote (a) the (adequate) mix of cooperation and competition conducive to long-term infrastructural development of a sector, and (b) the ability of the firms to innovate constantly and respond to new challenges and opportunities (1990, p. 19).

Drawing on Japan's and Italy's industrial policies, Best (1990, p. 20) suggests that a successful industrial policy should

(i) use creatively and shape the market;
(ii) have a production as opposed to distributional focus; and
(iii) be *strategically* focused, that is, target strategic sectors to maximise industrial growth.

A similar view is Humphrey and Schmitz's (1996) 'triple C approach' to industrial policy, whereby (industrial) policies aiming at the promotion of industrial structures (mainly of SMEs) capable of competing in a 'new competition' environment should aim at the following. First, they should target *collective* benefits, that is, public resources should become available to clusters, not individual firms.[12] Second, they should help firms and clusters to become more *customer-oriented*. Third, policies should aim at *cumulative* improvements in competitiveness (which may be stronger if the other two factors are already there). This suggests that policies should be carefully designed, long-term, consistent and coherent, and also that strength should be built on existing strength.

To conclude, Marshall has arguably provided a framework for understanding and analysing clusters (including industrial districts). Many authors have investigated the phenomenon of clusters, paying particular emphasis to one or another feature of the Marshallian industrial district, for example, Brusco (1990). Humphrey and Schmitz (1995) acknowledge that the gains from clustering, especially due to external economies and joint action, are already there in Marshall. Sabel and Zeitlin (1985) share with Marshall the role and importance of 'industrial atmosphere'. Becattini

(1979) provides a detailed account of Marshall's ideas on the issue of industrial districts.

Lacking from such a wealthy literature, however, is a conceptual framework for clusters. Lawson's (1999) competence theory of the region is the most integrated attempt to bring together insights from various camps (e.g. Marshallian industrial districts literature; economic geography; competence-based perspective). As firms are defined as bundles of competences in the competence-based theory, social systems can also be defined and analysed as bundles of competences. Lawson gave special emphasis to linkages within smaller units of the cluster (e.g. firms, or public agencies, etc.) and interaction taking place within a cluster. He argues that our understanding of clusters and regions, and their dynamics, can greatly benefit from resource-based insights.

We agree with that. On the other hand, however, the resource-based perspective does not seem to explain 'why clusters, as a form of cooperation, emerge' in the first place.[13] Richardson (1972) is the only one who provided a resource-based explanation for cooperation, although he did not elaborate on the benefits of, or the conditions for, it. In his 1972 work Richardson focused on static efficiency, explaining in which circumstances cooperation within firms is the more efficient way to organise production. He then extended his argument (Richardson, 2001, 2003) by explaining how the degree of intra-firm specialisation within the economy reduces the costs of adjustment to change. In a way, an economy with small firms is more flexible, thus more efficient at reallocating resources following a change. In either case, cooperation is viewed as an alternative to market or intra-firm coordination. Drawing on Richardson's ideas on cooperation and extending the Penrosean theory of the growth of the firm to (the growth of) clusters, we attempt to move from the (Penrosean) firm to the Richardsonian cooperation of (Penrosean) firms in the following section.

## 3. TOWARDS A RICHARDSONIAN AND PENROSEAN CONCEPTUAL FRAMEWORK FOR (THE GROWTH OF) CLUSTERS

Penrose (1959) examines the growth (expansion) of the firm. Expansion depends on the perceived productive opportunity of the firm, defined with reference to 'all of the productive possibilities that its entrepreneurs see and can (and are willing) to take advantage of' (1959, p. 31). The latter, in turn, depend on the managerial services that are available to the firm.

One of the basic determinants of the quantity and quality of entrepreneurial and managerial services available to the firm is knowledge. Knowledge is generated inside the firm and is used by the firm either for carrying out given activities or for planning and executing expansion; see, for example, Pseiridis (2001). This knowledge is thus essential both in shaping the 'productive opportunity' of the firm and (subsequently) planning and implementing its expansion.

At this point we need to examine in more depth the Penrosean notion of knowledge, its generation and its carriers (people working inside a firm). We also need to examine in more detail the Penrosean firm's 'productive opportunity' and its inducements to grow. In so doing, we will attempt to show the following. First, that clusters of firms may be seen as an expanded (or quasi) Penrosean firm. Second, and drawing on the previous point, that in cases of activities requiring cooperation *à la* Richardson, there can be Penrose-type effects within cooperating firms which might be working simultaneously and complementarily with Penrose-type effects within single firms. Third, while Richardson's ideas contribute towards our understanding of the circumstances under which cooperation will be the most efficient option, Penrose's ideas are needed to identify how and why the entrepreneurs are able to understand when the nature of some activities necessitates intra-firm cooperation.

Richardson (1972, 2003) has pointed to cooperation as a third mode of carrying out economic activities – the other two being the 'market' and consolidation (hierarchy). He provided a rationale for firm cooperation based on the nature of the economic activities that have to be carried out and on the nature of the distinct capabilities by economic agents. He defined 'similar activities' as those requiring the same capabilities, while 'complementary activities' are those that need to be combined with complementary ones for the production of a specific product. Richardson suggests that when two firms possess dissimilar capabilities that need to be 'closely' matched for the production of a given product, then these firms will find that cooperation is their best option (the alternatives being either market coordination or intra-firm coordination). This given product would be produced more efficiently if coordination took place within a cooperative arrangement than if each firm independently produced their part of the product and used the market to do the coordination. That is, to let coordination take place through the market would probably entail problems with specifications, quality and so on. If one of the two firms decided to carry out the whole of the production itself, this would require too much effort for the acquisition of the necessary matching capability. Thus cooperation is best in the case of complementary activities requiring dissimilar capabilities. That is, intra-firm cooperation is the most efficient way to organise production when it is important that

activities are 'closely' coordinated, while the capabilities needed for each activity are different.

Accordingly, integration is best when activities are both similar and complementary. Markets are best when activities are in no need of close coordination. This includes cases of similar and dissimilar activities. Both cases are very interesting, because then it is difficult to predict what the most efficient arrangement will be.

Let us start with the case of similar and non-complementary activities. When two activities require the same capability but no close coordination along a single production chain (similar but non-complementary activities), this could lead to three types of economic organisation. 'Market' coordination is the most obvious outcome. Each firm would specialise in its activity, and each would leave the coordination of the production of its respective products to the market. But each firm could seek other activities (carried out by other firms) which could be combined for the production of a third or fourth product. Here each firm can be seen to belong to a different coordination chain, and coordination may take place either in the market, or through cooperation. These firms may also find a way to exploit more fully their respective similar capability by increasing their scale or by conceiving and introducing a combination of their capability with complementary ones. If the latter are owned by other firms, cooperation will ensue. If they are owned by the same firm, there will be intra-firm coordination. If the complementary activities do not necessitate 'close' coordination, coordination will be left to the market.

The above holds if we consider that capabilities and activities remain constant through time and that two firms may possess almost identical capabilities. If we relax these, then there is the potential for specialisation of capabilities, so that the activities are no longer 'similar'.

This potential for specialisation of capabilities could eventually alter the nature of the activities themselves. The initial similar capabilities owned by two firms could be replaced by dissimilar ones (let's say capability A, variant 1 owned by the one firm and capability A, variant 2 by the other firm). These dissimilar activities could then point to 'market', if they are in no need of coordination for the production of a specific product. Further, at a later stage (and according to each firm's productive opportunity) there is also the possibility that either of these two specialised activities/capabilities will be used, along with other, different ones, possessed by other firms, in the production of other products ('cooperation'). Finally there is the possibility that either firm could use its own capability variant to produce other complementary variants (i.e. 'similar capabilities'), which could then be internally combined for the autonomous production of new

products. Similar reasoning could apply to the case of dissimilar and non-complementary activities.

To summarise, it is more efficient for activities which do not need close coordination to be left to the 'market'. That is, it is inefficient for a single firm to carry out (diversify into) unrelated activities which demand the use of different capabilities. In the case of unrelated activities which rely on a single capability, a firm has a stimulus for diversification into different activities. Applying the Penrosean rationale for firm growth to the above stories would provide the following account: similar and non-complementary activities could be seen as an inducement for a firm to expand its existing capability into new product lines or markets, which hints at expansion into 'neighbouring' areas.[14] Further, dissimilar and non-complementary activities could lead, if specialisation of capabilities takes place through time, to the same kinds of inducement for internal growth or cooperation. Table 2.1 provides a summary.

*Table 2.1 Richardson: markets, consolidation and cooperation*

| | Complementary activities (coordination needed) | Non-complementary activities (coordination not needed at product level) |
|---|---|---|
| Similar activities (requiring same capability) | Coordination through consolidation (firm) | No coordination needed between the two specific activities ('market'). However, coordination with other firms/activities may be of all three types. In the long run: all three types. |
| Dissimilar activities (requiring different capabilities) | Coordination through cooperation | As above |

Therefore, we have a production-based explanation of cooperation. That is, cooperation occurs, according to Richardson, because in some cases it is the most efficient of the three modes available. Thus, just as 'cooperation' between people within a firm (and related specialisation and division of labour) results in increased productivity, so cooperation between firms, bringing with it a combination of specialisation and division of labour properties, may result in increased productivity (through its positive effects on human resources, infrastructure, knowledge, etc.) in the economy.

Richardson's ideas are useful in providing us with an explanation of *observed* forms and/or predicting cooperation between firms. For example, one can observe a joint research agreement between two firms and explain it in Richardsonian terms. One might say that the activities that have been 'jointly' undertaken *must* have required the combination of distinct capabilities (and each firm within the agreement should, by definition, have at least one unique capability, hence the activities must be 'dissimilar'). In saying this we ignore the possibility that two activities, no matter how complementary and/or similar they are, do not merge into *one* activity once some form of cooperation has been introduced. This might tend to ignore that, post cooperation, the initial activities may be transformed, altered, or fused with each other to a degree that it might be difficult to describe, *ex post*, the initial activities, and further, that the firms that engaged in some form of cooperation must have done so because both activities are, in some way, crucially linked ('complementary' activities).

It is interesting to note here that many firms are seen to 'internalise' dissimilar activities, either complementary (as is the case with vertical integration) or even non-complementary (as is the case with diversification). Why do they do so? Maybe because the benefits from consolidation exceed the costs of carrying out and co-ordinating dissimilar activities. For example, a large firm may acquire more power in the market (thus enjoy monopoly profit) by undertaking dissimilar activities on its own. Were it to leave these to the market (and/or other firms), other firms might take better advantage of them and, at one time or another, they would probably 'internalise' (take over) the firm themselves.

In the case that activities are similar and complementary, that can be so either because the output of one activity is used as a specialised input for the output of the other activity, or because both activities provide outputs which have to be used in parallel to produce a given output. The first point has been extensively explained in Richardson (1972, 2003). The second, however, has remained rather vague. If the output of two activities has to be used in parallel, this implies the existence of a third, distinct activity of combining the two. The capability of combination hints at the existence of 'excess' managerial services that will be used to implement any type of expansion (cooperation included); see below.

The above shows that Richardson provides a good explanation for firm cooperation, focusing on the efficiency attributes of different types of organisation of production within an economy. This explanation is useful in that it departs from the view of cooperation of (neoclassical) firms as collusion and highlights positive benefits (on the production side), which include but also go beyond avoidance of the negatives (such as transaction costs); see also Pseiridis (2001). Further, it is also useful in that it helps us

understand various observed types of inter-firm cooperation, pointing to a base for a conceptual framework for clusters of firms. However, while Richardson may be useful in explaining why clusters or any other form of firm cooperation have ensued, there are still many issues to be addressed. For example, is it obvious to any firm that some activities require some form of cooperation? Penrose's ideas are useful in filling these gaps, as will be explained below.

At this point, it is helpful to be reminded of the Penrosean 'productive opportunity'. As Penrose writes,

> The productive activities of such a firm are governed by what we shall call its 'productive opportunity', which comprises all of the productive possibilities that its 'entrepreneurs' see and can take advantage of. … It is clear that this opportunity will be restricted to the extent to which a firm *does not see* opportunities for expansion, is *unwilling to act* upon them, or is *unable to respond* to them. (1959, pp. 31–2, emphasis added)

Most probably, the ability of a firm to choose a Richardsonian mode of coordination (cooperation, consolidation or market) must be already there in the productive opportunity of the firm. Its entrepreneurs may choose just because they are able to see and to make an economic judgement about alternative options. Therefore, the action of choosing and instituting a type of intra-firm, inter-firm, or market coordination does not seem to be one which may be left to random forces. Whether a firm's choice will be successful is another matter, pertaining to some kind of 'planning', 'decision', 'managing expansion' or 'executing' capability that a firm may possess (or perceives that it possesses); the issue here is that a firm purposefully chooses between several options (including leaving coordination of activities to the market) that it is able to discern.

Therefore, we cannot exclude the possibility that observed modes of coordination might not (prove to) be the best choice for a firm. As much as we are able to say that the jointly run research programme mentioned above might be a successful combination of unique, dissimilar skills needed for complementary activities, we could equally find out that such a coordination mode may have proved unsuccessful. This may be due to inadequate judgement of entrepreneurs, regarding both the existence of cooperation as a profitable productive opportunity (presupposing a good perception of internal capabilities of the firm; see below) and the excess managerial resources available to effect (expansion in the form of) cooperation. On the other hand, firms that enter into cooperative arrangements that are consistently successful and prove profitable to the participants signal that both firms have made a purposeful and educated choice.

But what does a purposeful and educated choice consist of? Each firm is guided, in its operations and activities, by the need to fulfil an objective. To delve into the determinants of specific objectives is not attempted here; we just find it plausible to adopt Penrose's assumption that

> [F]inancial and investment decisions of firms are controlled by a desire to *increase total long-run profits*. Total profits will increase with every increment of investment that yields a positive return, regardless of what happens to the marginal *rate* [original emphasis] of return on investment, and firms will want to expand as fast as they can take advantage of opportunities for expansion *that they consider profitable*. … In other words, *profits* would be desired for the sake of the firm itself and *in order to make more profit through expansion*. (1959, p. 29, emphasis added)

Therefore, the Penrosean firm purposefully adopts either a type of Richardsonian coordination or no 'coordination' at all (i.e. the market). There now emerges a most interesting issue. How is a firm's productive opportunity shaped? Do the entrepreneurs see all of the productive possibilities that are open to them? Further, what does their judgement about productive possibilities and their implementation possibilities depend upon?

To address this, we follow Penrose and assume that the relationship between the firm and its productive opportunity is a dynamic one. The availability and quality of entrepreneurial services shape, to a great extent, the productive possibilities available. Therefore, if a firm is seen to choose between the three Richardsonian modes of coordination, it chooses one over the others because its entrepreneurs are, first, able to see this mode as an opportunity; they then judge it as potentially more profitable *vis-à-vis* the other ones which they see as available.

This is how Penrose puts it:

> [A]lthough the 'objective' productive opportunity of a firm is limited by what the firm is able to accomplish, the 'subjective' productive opportunity is a question of what it thinks it can accomplish. … 'Expectations' and not 'objective facts' – indeed there must be if action is to be successful, for the success of a firm's plans depends only partly on the execution of them and partly on whether they are based on sound judgment about the possibilities for successful action. In the last analysis the 'environment' rejects or confirms the soundness of the judgments about it, but the relevant environment is not an objective fact discoverable before the event. … Firms do not only alter the environmental conditions necessary for the success of their actions, but, even more important, they know that they can alter them and that the environment is not independent of their own activities. … We shall be interested in the environment as an 'image' in the entrepreneur's mind, for we want, among other things, to discover what economic considerations, as contrasted with 'temperamental' considerations, determine entrepreneurial judgments about the environment. (1959, pp. 41–2)

A choice by the entrepreneurs, and implementation, of a Richardsonian coordination mode (e.g. inter-firm cooperation) may prove to be successful or disastrous to the firm. What determines the possibilities for success, both in the choice of mode and further implementation of the chosen mode? To address this issue, we should go back to the inner workings of the Penrosean firm.

According to Penrose, a firm's resources (human and physical) render services to the firm. Just as each firm consists of a bundle of resources, each resource consists of a bundle of potential services. The services that any given resource, in its interaction with other firm resources, gives to the firm are firm-dependent. That is, the same resource will not yield the same services to a firm as it would if it were employed in another firm. Each firm's uniqueness lies exactly in the fact that resources can be defined independently of their use, while services cannot.

Apart from physical products or services to be sold, one important output of the everyday workings of the firm is the creation of 'excess' productive services within the firm, and knowledge. The former is an input in the expansion process and the latter is an input into all productive resources and, consequently, the firm's productive opportunity. Further, the expansion process creates more, and more specialised, services (especially managerial ones) which are freed once the expansion process is finished.

Hence more and more unused productive services are becoming available to a firm, either through the everyday working or after an expansion process: productive services of a similar type as the existing ones, freed because existing resources are not entirely exploited, while they become more and more efficient with given tasks; and also new productive services, generated through the expansion process and freed once expansion has taken place. In parallel, unused productive services are further increased and improved owing to experience and knowledge acquired by human resources working in a firm. That is, the potential of existing resources to yield services (of any type) increases while these resources gain experience.

It is in this process of acquiring knowledge through experience that a firm's capability to actually *see* a Richardsonian mode of coordination, *judge* it as profitable and *take action* to adopt it may lie. Further, once (expansion through) cooperation has taken place, human resources from both firms end up with a stock of similar and/or 'new' productive services (importantly, some of them unique to the cooperative entity) to be redeployed in further expansion (in much the same way as a single firm is left with some new and unique productive services after expansion has taken place). The direction of expansion will be dependent upon the existence of new profitable productive opportunities, either in individual productive opportunities or in the productive opportunity owned by the cooperative 'entity'.

In Penrose's words,

> [T]he experience gained is not only of the kind just discussed which enables a collection of individuals to become a working unit, but also of a kind which *develops an increasing knowledge of the possibilities for action and the ways* in which action can be taken by the group itself, that is, by the firm. This increase in knowledge not only *causes the productive opportunity of a firm to change* in ways unrelated to changes in the environment, but also contributes to the 'uniqueness' of the opportunity of each individual firm. (1959, pp. 52–3, emphasis added)

Therefore, on the one hand, the services yielded by any one resource cannot be taken to exhaust total resource potential. On the other hand, experience endows individuals with even more increased potential.

> [E]xperience produces increased knowledge about things … experience itself can never be transmitted; it produces a change – frequently a subtle change – in individuals and cannot be separated from them. Increasing experience shows itself in two ways – changes in knowledge *and changes in the ability to use knowledge*. There is no sharp distinction between these two forms because to a considerable extent the ability to use old knowledge is dependent on the acquisition of new knowledge. (1959, p. 53, emphasis added)

Further,

> [O]nce it is recognised that the very processes of operation and of expansion are intimately associated with a process by which knowledge is increased, then it becomes immediately clear that the productive opportunity of a firm will change even in the absence of any change in external circumstances or in fundamental technological knowledge. (1959, p. 56)

That is, the Penrosean firm, having accumulated knowledge over time through its everyday workings (for normal operation or expansion), is able to identify productive possibilities that may not have existed for the firm before. Based on the same knowledge, the Penrosean firm is further able to assess whether these productive possibilities would be profitable. It is also able to draw up a plan aimed at embracing this perceivably profitable productive possibility, as well as use its resources (and also acquire and absorb new resources) to implement this plan.

Along similar lines, it could be argued that a cooperative arrangement provides conditions for interaction and 'working together', and thus acquiring experience, increasing knowledge, and producing 'excess' services, as is the case within a Penrosean firm. Individuals from both firms may be seen as individuals working within one firm, with the latter exhibiting somewhat lower levels of 'administrative coordination and authoritative communication' (which for Penrose define the boundaries of the firm). Thus,

to the extent that sufficient interaction among people of the two cooperating entities exists, it is reasonable to expect that a joint productive opportunity will be formed in the minds of the entrepreneurs, one that will include (joint) knowledge generated from joint activities, and excess services generated from working together that will be unique to the cooperative entity. Importantly, such knowledge and excess services would be valuable features of the joint productive opportunity, in that they will point to further cooperation and further combinations of the excess resources of participating firms.[15]

What emerges from the above is a Penrosean rationale and explanation for Richardsonian cooperation (and clusters of firms). Before the realisation of cooperation with other firms, firms should be able to see in (a type of) cooperation a profitable productive possibility. Firms choose a type of cooperation over other Richardsonian forms of coordination, and they choose the most profitable type of cooperation, judging on two grounds: the future increases in the productive opportunity they face, and the means they own (free services) to carry out expansion. If cooperation proves 'successful' and profitable over a long time, one can reasonably assume that the judgement of the firms involved has been quite accurate, and also that these firms have had the ability, apart from identifying a profitable productive possibility in cooperation, to plan and execute its implementation.

To conclude, Penrosean firms, through the process of acquiring experience (and, through this, knowledge) within their operation and expansion, gain and thus possess the necessary capabilities to identify, plan and execute expansion in any form (e.g. through acquisition of resources, cooperation, etc.). One such form may be some type of Richardsonian inter-firm cooperation, for example alliances, joint ventures, clusters and so on. In some cases, participating firms hold their separate identity by maintaining sufficient administrative coordination within them, as is the case with formal or informal contractual agreements. In other cases the boundaries of participating firms might get a little intertwined, as is the case with deliverable-oriented alliances or some kinds of clustering. In other cases still, a separate entity that may be identified as a firm may come as a result; see below.

It is reasonable to suggest that in all cases, albeit to a greater degree when boundaries of participating firms get somewhat fused, (individuals in) participating firms, through their everyday workings and interaction, acquire experience, in almost the same way that human resources within a firm acquire experience by working together. In other words, people working together within a firm gain experience, and, through experience they gain knowledge, which affects their service-yielding potential and the firm's productive opportunity. In much the same way, firms working together, by virtue of their human resources working together within some type

of inter-firm cooperation, also gain knowledge through experience which affects, apart from the separate firms' productive opportunities, a joint productive opportunity. That is, a joint venture, cluster, or other form of inter-firm cooperation might possess a unique productive opportunity of its own which would not exist had the participating firms not entered into cooperation. Importantly, this productive opportunity cannot be exploited (at least in the short run) by individual firms alone.

It is in this joint productive opportunity that profitable productive possibilities might be jointly available to participating firms. But this productive opportunity will be there, and will be continuously augmented, only to the degree that sufficient communication exists between (resources of) participating firms. The existence of profitable productive possibilities within this joint productive opportunity might be a reason why cooperating firms are seen to continue cooperating, for example, by embarking on new cooperative ventures. The lack of profitable productive possibilities in firms' respective productive opportunities might be the reason for not initiating cooperation in the first place. Once cooperation has been instituted and working, a lack of joint profitable productive opportunities might signal that individual firms have not allowed sufficient communication either between them and other firms, or within themselves, or that individual productive opportunities present more valuable options than the joint one (it could also be misperception of the productive opportunities available).[16] In any event, it seems reasonable to assume that the Penrosean limit to the rate of growth applies both to individual firms and to their joint cooperation activity (to the extent that sufficient interaction exists between the resources of participating firms). The crucial issue here is that cooperating firms, apart from being able to benefit from a joint productive opportunity, might also be able to enjoy in parallel an expanded individual productive opportunity, due to interaction of their resources with those of other firms. The latter constitutes an opportunity that would not have been available in the first place, that is, had they not seen a profitable productive possibility in cooperation and had they not entered into it.

To summarise, in this section we have highlighted the interest that firm cooperation, including clusters, has received in the literature and policy from the 1980s onwards. However, there is still scope for a conceptual framework for clusters and their growth. We attempted to address this by suggesting a conceptual framework for clusters, building on Richardson's insights on cooperation and Penrosean insights on knowledge and firm growth. We suggest that Penrosean effects of knowledge and experience may apply to cooperating firms and clusters as well. Interestingly, cooperation (and clusters) may create a joint productive opportunity that would not be there if

firms did not choose cooperation (clustering). At the same time, cooperation may enhance individual firms' productive opportunities, thus enhancing the whole economy's productive opportunity. A prerequisite for the exploitation of these productive opportunities is the existence of sufficient and efficient (entrepreneurial and managerial) services within firms. The existence of such services is important in seeing cooperation as a profitable opportunity, and successfully pursuing it.

Following from the above, there are three points worth highlighting in respect of a conceptual framework for cooperation and clusters. First, cooperative arrangements (including clusters) of firms may be seen as an expanded (or quasi) Penrosean firm. Second, drawing on the previous point, in the cases of activities requiring cooperation *à la* Richardson, there can be Penrose-type effects within cooperating firms which might be working simultaneously and complementarily with Penrose-type effects within single firms, all of them leading to increases in productivity. Third, while Richardson's ideas contribute towards our understanding of the circumstances in which cooperation will ensue, Penrose's ideas are needed to identify how and why the entrepreneurs are able to understand when (and when not) the nature of some activities necessitates intra-firm cooperation. Having discussed 'when cooperation' and 'how this choice comes about and works', in the following section we will discuss the issue of 'why support cooperation and clusters?', by linking our discussion to recent concerns about productivity and competitiveness.

## 4. CLUSTERS AND THE DETERMINANTS OF PRODUCTIVITY

Having examined the advantages stemming from cooperation, we now investigate further the effects of cooperation and clusters on firm (but also regional and national) productivity and competitiveness. To do this, we expand on the 'productivity–competitiveness wheel' model (Pitelis, 1998). In this model, competitiveness is linked with productivity, which is shaped by four elements: human resources; infrastructure; unit cost economies; technology and innovativeness. All these work within the broader sectoral, regional, macroeconomic and social and institutional environment. Horizontal measures, optimal firm size, clusters of SMEs and firm strategies for sectoral restructuring are all linked to the 'competitiveness wheel', through their effects on the determinants of productivity. But how exactly do clusters affect the productivity wheel? We will attempt to throw some light to this issue, based on our previous analysis.

## 1. Human Resources

Human resources within a cluster, by virtue of the continuous interaction that takes place, are more likely to specialise in the cluster's needs.[17] Human resources within a Penrosean firm expand their potential services by working together within a firm; human resources within a cluster may further enrich this potential by having the opportunity to work together with other people within their cluster. Hence a cluster expands and enriches the opportunities for fruitful interaction between human resources, which may increase their quality and availability (in the Penrosean sense of 'excess' productive services). Since the quality and availability of human resources is a determinant of productivity, clusters offer opportunities for increased productivity through the enhanced (potential of) human resources.

## 2. Infrastructure

A cluster may offer improved material resources to the firms located within it relative to those located outside. This is so because all the workings that take place within a cluster are more oriented to the cluster's needs. Therefore roads, telecommunication networks, computer networks and so on are more fully used within a cluster (Humphrey and Schmitz, 1995), and also their enhancement is oriented to serve the logic of the cluster's needs.[18] This also includes infrastructure generated through common action by the cluster's members.[19] Machinery for common use, bought through understanding of mutual needs and common action and funding, is a case in point.

Apart from this commonly mentioned type of infrastructure, there is another type of 'hard' infrastructure that is available to a cluster's participants and may enhance their productivity and competitiveness. Within a cluster, specialised hard infrastructure owned by a member of the cluster becomes, in some way, the property of all the other firms within a cluster. That is, firms may make use of this type of infrastructure by embedding its output in their own production process, thereby indirectly making use of others' infrastructure. Since a cluster strengthens the motive for innovation in the firms within it, and the allocation of labour within it becomes more and more intricate, it could be said that this type of infrastructure within the cluster, which becomes all the more intricate and specialised to (a firm's and thus the) the cluster's needs, is available, in some way, for use by other firms within it as well. Further, the benefits of investment in training staff made by one firm may easily spread to other firms through the mobility of workers. Although this is an indirect way for a firm to 'own' and make use of infrastructure actually owned by other firms, it is arguably a most important feature of a cluster that increases the productivity potential of

the firms within it. Hence clusters, by improving infrastructure content and quality in two ways, may actually lead to improved productivity relative to geographically dispersed firms of comparable size.

## 3. Unit Cost Economies

Clusters are usually associated with small firm size. The benefits from clustering may outweigh losses from the absence of large size and the benefits traditionally associated with large volumes of production (e.g. economies of scale or economies of learning, the latter associated with cumulative volume); see Marshall (1920), Piore and Sabel (1984), Best (1990), among others. A cluster as a whole may or may not achieve economies of scale as such (i.e. in terms of volume of a single product), but it may replicate them. The likelihood of the existence of economies of learning (e.g. by an increased cumulative volume of highly specialised parts), economies of experience, and also economies in transaction costs (facilitated by the reduction in opportunism and the existence of trust) may be larger within a cluster's firms than within a single big firm unrelated to a cluster. Firms within a cluster may be in a privileged position to 'shop' for knowledge and other inputs in other, heavily specialised (small) firms.[20] Since specialisation and flexibility are more relevant to/associated with small size and changing demand conditions, the quality of inputs (intermediate products) within a cluster will tend to be better than outside. While, therefore, a large firm may reap high economies of scale or economies of learning for a given product, a cluster might have proceeded to produce the next generation of this product, thus establishing early positions in the markets and hence enjoying the benefits associated with first-mover advantages and the introduction of new technologies, products, processes and so on. This might be especially true in sectors or products with high technological/knowledge content, but not only there. Almost all sectors or products can be seen as having a high-technological/knowledge content; see, for example, Porter (1998a). Further, the existence of positive external economies as analysed in traditional economic theory is by definition more likely to occur within a cluster than outside it (see, for example, Marshall, 1920; Humphrey and Schmitz, 1996).

In addition, management of firms within clusters may have more, and cheaper, opportunities for fruitful, face-to-face, everyday interaction (overall, opportunities for increased experience by working together, as has been posited by Penrose for people working within a firm). Managerial staff are, therefore, more likely to face an augmented productive opportunity, which, moreover, will tend to include more, and more *profitable*, opportunities for internalisation of transactions.

The competence of managers and entrepreneurs within a cluster's firms may lead to an augmented productive opportunity for each firm that may also include profitable opportunities for Richardsonian cooperation, as illustrated in the previous section. That is, competent management is more likely to demonstrate a higher degree of self-knowledge. Knowing a firm's capabilities (plus an appropriate degree of interaction) produces opportunities for profitable capability matches, that is, cooperation.[21] This may also be the missing link between transactions and choosing to carry out appropriate transactions for efficient production. Whether it will be most profitable to internalise these transactions (integration) or to carry them out via the 'market' (cooperation or Coasean 'market') depends on the nature of the transactions, that is, on the complementarity and similarity of 'Richardsonian activities', as presented above.

Further, there are instances within clusters where the costs of purchase and maintenance of machinery and infrastructure (e.g. common buildings, warehouses, exposition areas, etc.) are shared by many firms. As a result, the capacity of these resources might by used more fully and, consequently, at lower cost per unit produced than if they were owned by a single firm.

Last, but not least, close interaction of firms within a cluster can result in economies of time. That is, feedback on a firm's products that are used as inputs for the other firm's production process may be faster than where the firms are geographically dispersed. Face-to-face interaction in the locality may also enhance this effect.

To summarise, collocation of firms within a geographical area may reduce unit costs in at least five ways. First, production costs may be lower owing to continuous innovations (and new technologies used) that may take place within a cluster. Second, and related, firms within a cluster may enjoy economies related to first-mover advantages, that is, introduction of new products. Third, transactions within a cluster may be fewer or less costly (as trust may be stronger), and internalisation of transactions is more likely to lead to real, tangible, transaction cost economies. Fourth, a cluster will benefit from external economies. For example, interaction may bring economies of learning, albeit not for a *given* product, but rather in processes, innovation and so on; see also Richardson (2003) (for example, economies of learning to innovate, economies of learning to learn, economies of learning to change, etc.). Further, the cost of purchase and maintenance of shared machinery and infrastructure is more likely to be lower when these are (more fully) used by many firms within a cluster. Fifth, firms within a cluster may also realise reasonable time economies.

The above suggests the existence of some beneficial effects of clustering on unit costs. It can thus be suggested that the collocation of small firms or a large size firm (that already enjoys advantages of size) within a cluster

of mainly small firms could increase benefits for all firms in terms of unit cost economies.

## 4. Technology and Innovation

There is a large literature on innovation and incentives to innovate. Among this, there is growing recognition and evidence that (clusters of) small firms can be more innovative than large firms. There are a number of ways that clusters can have beneficial effects on technology and innovativeness, some of which are explored in detail in the chapters in this volume by Henry and Pinch (Chapter 5) and Di Tommaso et al. (Chapter 13).

First, collocation improves communication and interaction between firms with different skills and capabilities. Mutual interdependence leads to continuous efforts to improve (see Cowling and Sugden, 1999, on localities, and Porter, 1998a, on peer pressure). Firms within a cluster recognise their mutual interdependence and also strive for excellence to distinguish themselves from peers. Thus a problematic input may turn out to bring about a technological improvement as well as increased status within the local community.

Second, to the extent that collocation favours the division of tasks among firms, the everyday workings of firms are more oriented to the cluster's (or to specific firms') needs. That is, specialised skills increase and become available for use in new, but related, areas; along with increased skills, innovative ideas are more likely to abound.

Third, geographical proximity of firms enhances favourable conditions for profitable Richardsonian cooperation and transaction internalisation. Cooperation of firms may by itself constitute an innovative idea regarding business practices; internalisation of transactions could be seen in the same light.

Fourth, technology available to some firms within a cluster may be improved by common actions (and also at a smaller cost than if it were purchased and maintained by one single firm). For example, many firms that have also shared relevant expenses may share high-technology tools or machinery, or specialised (e.g. CAD/CAM) computer applications.

## 5. Sectoral, Regional and Institutional Atmosphere

Clusters can be seen as a more participatory and open industrial structure *vis-à-vis* large firms (see Cowling and Sugden, 1999). It is thus likely that clusters enjoy wider support from the communities within which they operate. Therefore, requests of firms within clusters regarding infrastructure, legislation, education programmes, publicly funded research and so on

may enjoy a wider base of support from local or state authorities, as they encapsulate needs from a wider base within the locality, and as benefits will be widely dispersed within it. In this context, working interaction between firms and the authorities is more likely to be fruitful at a local (cluster locality) level than elsewhere. Further to this, and subsequently, peer pressure within a cluster may cross the boundaries of the cluster and 'infect' public officers as well. It is thus most likely that, through working, everyday interaction, public officers will have increased motivation to serve the clusters' and the locality's needs.

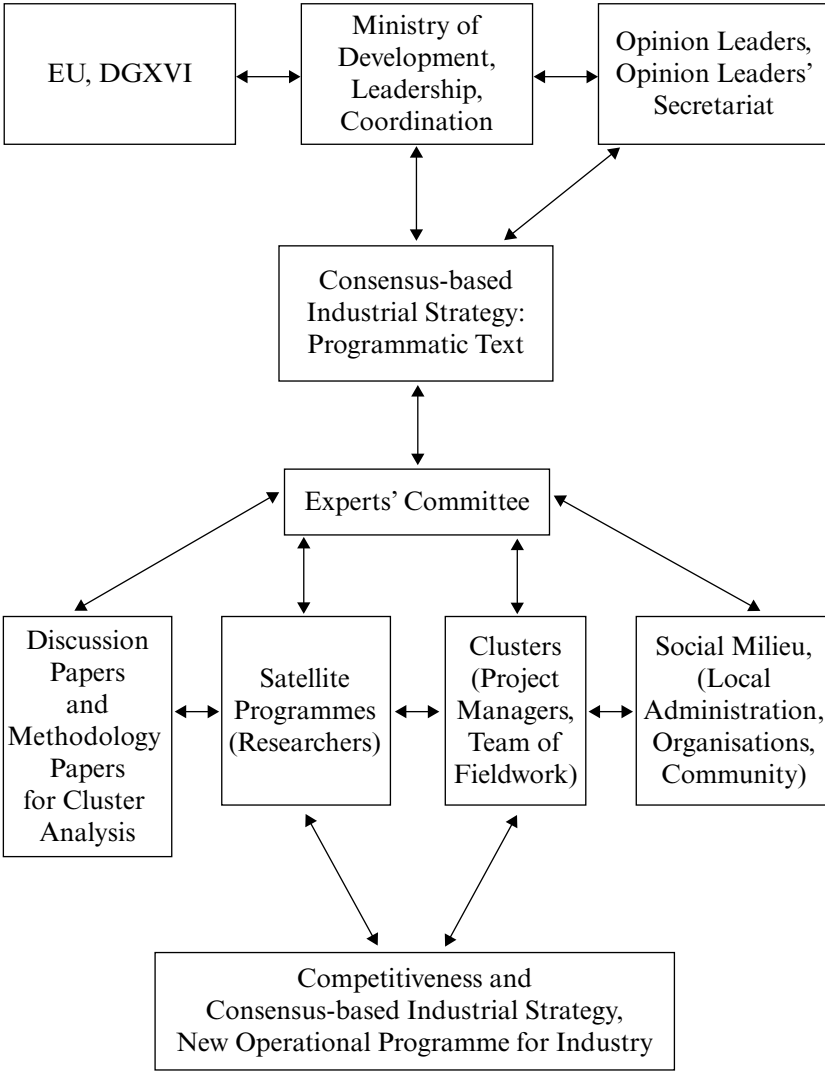
We attempted to address in detail the way clusters are linked to the 'productivity–competitiveness wheel' introduced by Pitelis (1998). In a similar vein, Porter's (1998a) 'diamond' of national competitiveness links some important attributes of a state (or region) to the competitiveness of its industries. He also suggests that clusters are crucial to competitiveness in that they positively affect all attributes of the 'diamond' (Porter, 1990). The relationship, however, between clusters and competitiveness is not straightforward. It should start, we believe, with a discussion of the effects of clusters on productivity.

We therefore tried to show in what ways clusters are important in enhancing the productivity potential of a state of region. To do this, we were assisted by the theoretical framework of clusters suggested in the previous section. That is, clusters may be seen as a Penrosean quasi-firm and may thus own some characteristics inherent to Penrosean firms. In this framework, it is interesting to note that cluster dynamics may lead to the incorporation, within this quasi-firm, of public officers as well. That is, locality and clustering may strengthen inter-organisational interaction, teamwork, cooperation and associated benefits. This is linked, for example, both to the 'community' framework in which Sugden et al. root their analysis of cluster governance in Chapter 3, and to the detailed discussion of territorial governance provided by Gilly and Perrat in Chapter 7.

## 5. SOME COMMENTS ON IMPLEMENTATION

In this section we aim to apply aspects of the framework developed thus far in a brief analysis of a specific 'cluster' policy, where comparisons might be drawn, for example, with the analysis of cluster policy in the Basque region of Spain provided by Aranguren et al. in Chapter 12. We focus on a notable example of a policy to support clusters in Greece: the 'Future of Greek Industry' project (henceforth FGIP), run from 1994 until 1997; see Pitelis et al. (1997). The FGIP used local, national and international expertise to produce a consensus-based industrial strategy for Greece. The organisation

of the FGIP is illustrated in Figure 2.1. As a result, potential clusters were diagnosed, and among them 'pilot' clusters were chosen, that is, clusters that were considered to be good candidates for subsequent upgrading. Support would not accrue to individual participating firms, but to a distinct new legal




*Source*: Pitelis et al. (1997).



*Figure 2.1 FGIP organisation chart*

entity (the 'cluster carrier') which should be jointly owned by participating firms. To exploit market signals and dispersed knowledge on top of the results of the FGIP, funding was allocated through 'open bids', where firms in pilot but also in other clusters could apply. In what follows we provide some comments on implementation of the two first bids which led to the funding of 54 'cluster carriers'.[22]

## Average Number of Firms in Cluster Carriers

The average number of firms participating in each cluster carrier was ten in the first bid, and subsequently fell to eight in the second bid.

Both are rather small numbers, not allowing sufficient interaction between firms, nor large-scale projects.[23] In the light of the preceding analysis, this small number of actively participating firms would not easily yield the advantages associated with interaction between the resources of various firms. Therefore the individual productive opportunities and the joint one could not provide a full set of profitable productive opportunities to the firms involved.

It is interesting to note that cooperation (in the form of action towards creating a cluster carrier) has apparently been easier to establish when there were previous formal or informal linkages (acquaintances or pre-existing cooperation) with other firms/individuals.[24] Importantly, many of these linkages had already been developed while potential clusters were being analysed within the FGIP. Many workgroup members were the first to motivate firms to cooperate and jointly apply for funding. This partly explains the fact that almost half of the supported clusters were empowered/organised by local people who were involved, in one way or another, in carrying out the analyses of the potential clusters. Hence another 'product' of the FGIP has been the development of knowledge regarding the potential benefits of cooperation and clustering *within* the analysed areas, which was subsequently used to spur the development of clusters.

Table 2.2 provides a list of the potential (some of them 'pilot') clusters that were identified by the FGIP, and the corresponding number of successful proposals for the creation of cluster carriers. These proposals, however, were not the only ones that were eventually funded. Funding was also allocated to proposals for cluster carriers that had not been identified by the FGIP.

## Activities of Funded Cluster Carriers

Supported cluster carriers have mainly built on/boosted already existing activities, especially in 'traditional' sectors (clothing, agricultural products and foods, marble). There were a few notable exceptions to this rule (such

*Table 2.2 Potential and funded clusters*

| Potential and pilot* clusters | Potential cluster area | Funded, first bid | Funded, second bid |
|---|---|---|---|
| Software applications and software for technical construction firms* | Attica | 0 | 0 |
| Laser applications in industry | Attica | – | – |
| Automation in production | Northern Greece | 2 (informatics) | 2 (informatics) |
| Juice producers* | All of Greece | – | – |
| Industrial area of Elaionas* | Attica | – | – |
| Perama shipbuilding and repair area and Piraeus Shipping Centre* | Attica | 0 | 1 |
| Metal products* | Kozani and Volos | 2 | 0 |
| Postgraduate studies and further training | Attica | 1 | 0 |
| Consultancy services | Attica | – | – |
| Wine* | Macedonia and Epirus | 1 | 0 |
| Meat and dairy products* | Thrace and Epirus | 2 | 0 |
| Development of a biomass cluster* | Thrace | 0 | 0 |
| Garments | Xanthi, Drama and Kavala | 4 | 2 |
| Marble* | Macedonia & Epirus | 1 | 3 |
| Canned fruit* | Northern Greece | 0 | 2 |
| Wood and office furniture | Northern Greece | 1 | 1 |
| Quality products, primary manufacturing, tourist services* | Crete | 2 | 0 |
| Furs* | Kastoria | 1 | 0 |
| Agricultural technology | Central Macedonia and Central Greece | 1 | 0 |
| Total | | 16 | 9 |
| *Total funded (grand total = 54)* | | 28 | 26 |

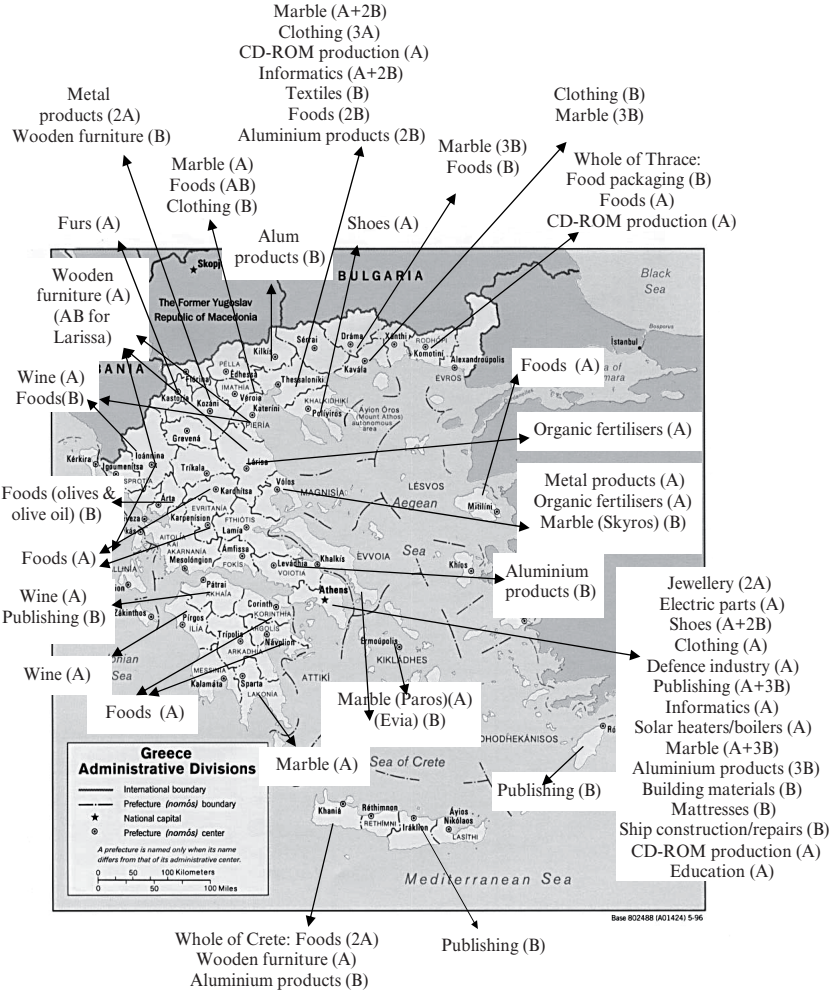
*Note*: 'Pilot' clusters were the ones considered as good candidates for support.

*Source*: Pseiridis (2001).

as the cluster carriers in informatics), especially in combinations with 'traditional' activities (such as publishing), which point to the potential existence of more high-value-added/high technological content opportunities for future clusterings.

## Geographical Dispersion of Supported Clusters and Inter-cluster Linkages

Figure 2.2 and Table 2.3 show the geographical dispersion of the supported cluster carriers. It is obvious that the two largest cities of Greece (Athens




*Note*: Parentheses after the activities indicate whether there are firms, based in this region, which were members of a cluster carrier supported by public funding, in the first (A) or second (B) bid. More specifically:

(A) indicates that at least one local firm is a member of a cluster carrier which has received public funding through the *first* bid (October 1997)

(B) indicates that at least one local firm is a member of a cluster carrier which has received public funding through the *second* bid (December 1998)

(2A) means that some local firms were members of two different cluster carriers which were supported through the *first* bid.

*Source*: Courtesy of the Perry–Castaneda Library Map Collection, The Central Libraries at the University of Texas at Austin.

*Figure 2.2 Regions involved in cluster activities in Greece*

*Table 2.3 Number of (publicly funded) cluster carriers in which there is participation by local firms, by region (see Figure 2.2)*

| Administrative region | Prefecture | Cluster carrier activity | Number of cluster carriers with participation by local firms | |
|---|---|---|---|---|
| | | | 1st bid (10/1997) | 2nd bid (12/1998) |
| Thrace | | | | |
| | | Foods | 1 | |
| | | Food packaging | | 1 |
| | | CD-ROM production | 1 | |
| Eastern Macedonia | | | | |
| | Drama | Marble | | 3 |
| | | Foods | | 1 |
| | Kavala | Clothing | | 1 |
| | | Marble | | 3 |
| | Serres | N/A | | |
| Central Macedonia | | | | |
| | Kilkis | Aluminium products | | 1 |
| | Thessaloniki | Marble | 1 | 2 |
| | | Clothing | 3 | |
| | | CD-ROM production | 1 | |
| | | Informatics | 1 | 2 |
| | | Textiles | | 1 |
| | | Foods | | 2 |
| | | Aluminium products | | 2 |
| | Chalkidiki | Shoes | 1 | |
| | Pella | N/A | | |
| | Imathia | Marble | 1 | |
| | | Foods | 1 | 1 |
| | | Clothing | | 1 |
| | Pieria | Wine | 1 | |
| | | Foods | | 1 |
| | | Wooden furniture | 1 | |
| West Macedonia | | | | |
| | Florina | N/A | | |
| | Kastoria | Furs | 1 | |

| | | | | |
|---|---|---|---|---|
| | Kozani | Metal products | 2 | |
| | | Wooden furniture | | 1 |
| | Grevena | N/A | | |
| Epirus | | | | |
| | Ioannina | Wooden furniture | 1 | |
| | | Foods | 1 | |
| | Thesprotia | N/A | | |
| | Arta | Foods (olives & olive oil) | | 1 |
| | Preveza | N/A | | |
| Thessaly | | | | |
| | Magnissia | Metal products | 1 | |
| | | Organic fertilisers | 1 | |
| | | Marble (in Skyros island) | | 1 |
| | Larissa | Organic fertilisers | 1 | |
| | Trikala | N/A | | |
| | Karditsa | Foods | 1 | |
| Central Greece | | | | |
| | Evvoia island | Marble | | 1 |
| | Attica | Jewellery | 2 | |
| | | Electric parts | 1 | |
| | | Shoes | 1 | 2 |
| | | Clothing | 1 | |
| | | Defence industry | 1 | |
| | | Publishing | 1 | 3 |
| | | Informatics | 1 | |
| | | Solar heaters/boilers | 1 | |
| | | Marble | 1 | 3 |
| | | Aluminium products | | 3 |
| | | Building materials | | 1 |
| | | Matresses | | 1 |
| | | Ship construction/ repairs | | 1 |
| | | CD-ROM production | 1 | |
| | | Education | 1 | |
| | Voiotia | Aluminium products | | 1 |
| | Fokida | N/A | | |
| | Fthiotida | N/A | | |
| | Evritania | Foods | 1 | |
| | Etoloakarnania | N/A | | |

| | | | | |
|---|---|---|---|---|
| Peloponnese | | | | |
| | Korinthia | Foods | 1 | |
| | Argolis | Foods | 1 | |
| | Arkadia | N/A | | |
| | Lakonia | Marble | 1 | |
| | Achaia | Wine | 1 | |
| | | Publishing | | 1 |
| | Ilia | Wine | 1 | |
| | Messinia | N/A | | |
| Crete | | | | |
| | Lassithi | Foods | 2 | |
| | Heraklion | Publishing | | |
| | | Foods | 2 | 1 |
| | Rethymnon | Foods | 2 | |
| | Chania | Wooden furniture | 1 | |
| | | Aluminium products | | 1 |
| | | Foods | 2 | |
| Aegean islands | | | | |
| | Lesvos island | Foods | 1 | |
| | Paros island | Marble | 1 | |
| | Rhodos island | Publishing | | 1 |
| All other islands | | N/A | | |
| Ionian islands | | N/A | | |

and Salonica) are heavily concentrated with firms that are involved in cluster carriers. The less developed regions have been 'represented' by relatively few proposals. For example, Thrace in north-east Greece is the home region of only two cluster carriers (dairy products and food packaging) and another firm participating in the cluster carrier for the production of CD-ROMs.

While the dairy products (which interestingly received the largest funding among 'traditional' activities) and the packaging cluster in Thrace can be seen as complementary, we believe that funding of a third one (production of energy from biomass, which is a by-product of dairy firms) would strengthen the local clusters by providing more productive possibilities to the firms and cluster carriers involved.

## Amount of Funding

We believe that more funds should have been allocated to each proposal. Investment in such clusters would also be facilitated if the private (firm) cost

of investment were spread across a larger number of quite large firms. For example, despite potential benefits (including linkages with other clusters in the region), the biomass cluster has been hard to empower. One reason could be that it represented a new activity with large capital requirements and within a less developed area in which there was no relevant knowledge from existing activities (and, importantly, also little knowledge about cooperation).

Further, there have been other cases where initial and fixed funding was very small for subsequent development of the clusters, with no provision for (renegotiation of) further funding to cluster carriers. A case in point is the SolarNet cluster (boiler production). While the initial business plan was modest, the participating firms subsequently realised that if their cluster carrier were to be successful, they should go for a larger investment or nothing. They opted for the former and created one of the most state-of-the art factories in Europe, with exports since its testing phase.

A related issue pertains to the selection and support of multiple cluster carriers of the same activity, such as food (ten cluster carriers), clothing (six), marble (four), and aluminium products (three). In spite of allocating funds to similar clusters, the Ministry could have supported more diverse (and more open) ones in core areas. These could subsequently have attracted more participants onto a path of further development. Most importantly, and to save funds that could support larger clustering ventures, the Ministry could have based its selection on an additional criterion: the existence of linkages between different clusters. Successful examples of complementary clusters are the dairy foods (first bid) and food packaging (second bid) cluster carriers in Thrace.

**Bureaucracy**

Another shortcoming of the implementation process faced by all clusters has been the large bureaucratic burden imposed on them by the Ministry. First of all, participating firms had to found a separate legal entity (i.e. the 'cluster carrier') to actually receive the funding, and then the cluster carrier had to submit a letter of guarantee to the Ministry. Obtaining letters of guarantee from banks, however, proved a challenge for the cluster carriers, since the former are usually reluctant to guarantee newly-borns. Dealing with this resulted in a loss of valuable time and resources.

The creation of a new legal entity and also tedious progress reports complete with supporting paperwork were required to ensure that individual firms would not use the funding received to support their own interests, but rather to promote collective interests.

Interestingly, however, there have been instances of participating firms complaining that their products were not given a fair share of the (joint) effort (mainly joint promotion in exhibitions or joint sales efforts). Usually cluster carriers were staffed by people from participating firms; hence the staff's actions were biased towards the benefit of their 'mother' firm. Since generally these were people of high skill and it would be unfortunate if they were excluded from the cluster carrier, we believe there is no safer way of dealing with this inherent inequality than allowing a larger number of participating firms in a cluster carrier, thus increasing intra-carrier competition.

## Horizontal and Vertical Linkages

We believe that some of the most interesting developments have been within clustering proposals that aimed to enhance the (quality of) the participants' final products by improving backward stages in the production chain. The most notable examples include the establishment of a common quality assurance lab (for aluminium products); the production by the cluster carrier of a basic input of top quality (e.g. boilers for solar heaters) which is then bought and used by participating firms in the production of their own products; and the provision of a common variety of wine for subsequent use (blending with other varieties) by each participant. Importantly, the wine cluster carrier has also become a competitor of its participants by proceeding to the creation and trading of a new wine label.

## Knowledge Creation and Productive Opportunity

As mentioned above, the FGIP gathered existing knowledge and also created new knowledge. Then firms and individuals used this to develop cluster carriers. One of the most interesting developments, in our view, is that cluster carriers have also created new knowledge, which has been used in many instances for further expansion into activities other than those originally conceived. That is, individuals and firms have produced, through working together and interacting, new knowledge and new capabilities, and at the same time have seen the possibility that both could be used profitably to explore new joint production opportunities. The most notable examples are CosmoMarble and PressNet; see Pseiridis (2001). The initial objective of the former, for which funding was granted, was the expansion of the existing distribution network into foreign markets, especially China. Then CosmoMarble proceeded to establish a joint venture in Shanghai, China (a marble-processing factory). PressNet is a cluster carrier made up of six similar firms (publishers of regional newspapers), which aimed

to upgrade newspaper quality and distribution. PressNet developed and provided electronic archiving services for newspapers, and is expanding into corporate archiving.

These few examples point to the inconclusiveness of judging the relative prospects of each clustering venture based solely on whether horizontal and/or vertical linkages exist. The coexistence of vertical linkages may be facilitatory in some cases (e.g. promotion) because the cluster carrier can build on existing strengths of individual firms and also induce further specialisation and division of labour. However, the lack of vertical linkages might not preclude the possibility of a new division of labour based on the relative strengths of each participant. The examination of whether, and to what extent, the formation of cluster carriers led to further specialisation and division of labour within the cluster carrier's participants, and whether vertical linkages have facilitated specialisation within cluster carriers, could be interesting topics for future research.

The latter observation brings up the issue of cluster 'openness'. As funding was given to a new firm, the 'cluster carrier' remained, mainly owing to its legal shell, relatively 'closed' to new linkages and additions. We believe that the provision for openness should be taken into account in similar initiatives. Further, the creation of clusters apparently (to a certain degree) builds on and exploits existing linkages between firms; therefore the potential for creation and profitable use of new linkages should be added, we suggest, to the selection criteria in subsequent rounds of funding.

In sum, the FGIP has arguably succeeded in increasing awareness of businesspeople and public sector officials alike on the benefits of clusters. In fact, numerous applications for funding came from firms from within the 'potential' clusters that were identified during the 'project'; see Table 2.2. These firms were eager to initiate a clustering venture and thus cooperated to apply for funding. Further, and most importantly, the FGIP has arguably been successful in institutionalising clusters as a productive possibility for Greek firms, thereby enhancing their productive opportunity.

To summarise, the above suggests that the FGIP, and the subsequent implementation of its results regarding support for clusters, can be seen as an example of a reasonably successful national policy experiment for the enhancement of productivity and competitiveness through clusters, despite some limitations. First, the number of participating firms has been rather small. Second, more regions should be involved in clusters and more inter-cluster linkages sought. Third, there does not seem to be a full representation of the potential clusters that were identified by the FGIP, which could mean that its results have not been fully exploited. Fourth, numerous cluster carriers of the same activity were supported instead of multiple clusters in different activities, or instead of a larger one in each activity. Fifth, the

cluster carriers in their current legal form are quite rigid and cannot easily accommodate the inclusion of future member firms and/or other linked cluster carriers. Sixth, the size of funds allocated to each cluster carrier was quite small, therefore not inviting/facilitating cooperation for large-scale investments. Last, the administrative requirements imposed on the cluster carrier by the Ministry required the dedication of large amounts of resources which would be more profitably used in seeking or effecting (further) cooperation.

Despite the above limitations, the private sector seems to have welcomed the possibility of cooperation and clustering. The concept of clusters is now an integral part of Greek reality and it seems to be a fruitful one. Further, the example of Greece currently forms the basis for other projects for the development of clusters. The Netwin project (Networking for Innovation), which was funded by the EU and was run by six business and innovation centres (BICs) in Italy, Portugal, Ireland, Northern Ireland, France and Greece, is a notable example. Its objective was to diagnose and support the development of innovative clusters. Its diagnosis tools have been developed on the basis of the Greek experience by the coordinator of the FGIP.

As mentioned above, the adoption of clusters as a policy for competitiveness was based on the understanding that clusters may positively affect the determinants of productivity and (thus) competitiveness.

For the case of marble, for example, as shown in Table 2.4, the volume of Greek marble exports to China increased by almost 17 000 per cent in the years 1995–2000. This development coincides with the activities and promotion efforts that were encouraged with support to the four existing clusters.

To conclude, while it is too early to be decisive, and notwithstanding the problems of transferability, clusters as a policy for competitiveness seem to have worked reasonably satisfactorily for Greece so far. Therefore, the Greek experience/experiment could be used as a model for the development of competitive clusters in other countries or regions, in particular less favoured ones.

## 6. CONCLUDING REMARKS

In this chapter we provided a conceptual framework for cooperation and clusters based on the insights of Penrose and Richardson. We suggested that cooperation (e.g. in the form of clusters) of firms may be seen as an expanded Penrosean firm and hence there can be Penrose-type effects within cooperating firms. More specifically, cooperation, apart from enhancing individual firms' productive opportunities, may also create an additional

*Table 2.4 Marble exports (volume and value) to China*

| | Volume (in tons) | | | | Value (current prices in grd) | | | |
|---|---|---|---|---|---|---|---|---|
| | Exports to China | % change | Exports to third countries | % change | Exports to China | % change | Exports to third countries | % change |
| 1995 | 235 000 | | 40 330 013 | | 18 316 352 | | 2 738 486 806 | |
| 1996 | 206 600 | –12.09 | 38 136 959 | –5.44 | 13 307 190 | –27.35 | 2 833 981 143 | 3.49 |
| 1997 | 1 799 000 | 770.76 | 50 113 299 | 31.40 | 141 992 792 | 967.04 | 3 708 642 162 | 30.86 |
| 1998 | 2 017 101 | 12.12 | 69 042 925 | 37.77 | 158 214 294 | 11.42 | 3 894 903 192 | 5.02 |
| 1999 | 8 856 327 | 339.06 | 83 101 094 | 20.36 | 728 497 754 | 360.45 | 4 909 174 863 | 26.04 |
| 2000 | 40 056 242 | 352.29 | 160 726 971 | 93.41 | 2 917 101 156 | 300.43 | 9 544 517 938 | 94.42 |
| 1995–2000 | | 16 945.21 | | 3 885.28 | | 15 826.21 | | 248.53 |

*Note*: 1 euro = 340.75 grd.

*Source*: Calculated from data from National Statistical Service of Greece (SITC 27312).

productive opportunity which may be jointly enjoyed by participating firms. We also suggested that a crucial element in the selection of cooperation (*à la* Richardson) as a profitable productive opportunity is the process of acquiring knowledge through experience, which takes place within Penrosean firms and Penrose-type entrepreneurs. That is, while Richardson's insights are useful to understand the conditions under which cooperation will be a profitable option, Penrose's theory is crucial in identifying why and how entrepreneurs are able to understand when the nature of activities calls for cooperation.

Further, based on our analysis we attempted to examine how cooperation and clusters may affect productivity. Using the 'productivity–competitiveness wheel' model as a starting point, we examined in more detail the ways that clusters can affect each determinant of productivity, identifying how cooperation and clustering may positively enhance each one of them. Finally, we used our suggested framework to assess the effectiveness of a policy aimed at the promotion and/or creation of clusters in Greece. Our discussion suggests that the implementation of this policy could be improved if more emphasis were given to:

1. Promoting the 'openness' of clusters. The formal and informal 'entry' of other new firms within the shell of a cluster should be facilitated because it would offer more opportunities for interaction and competition between firms, and would thus enhance even more the productive opportunity of participating firms and the joint productive opportunity.
2. Involving more firms. The average number of firms in existing cluster carriers is quite low to bring about significant increases in productive possibilities that participating firms see as profitable, and are able and willing to implement.
3. Giving larger amounts of funding in fewer but larger cluster carriers instead of funding numerous small ones in the same or in different activities. The support of multiple cluster carriers has been very much the norm in activities such as food, clothing and aluminium products. Support for fewer but larger cluster carriers would lead to increased competition among participants, and hence would provide a stimulus for intra-cluster firm specialisation. This, combined with more opportunities for interaction between firms, would, in turn, create more productive possibilities for participating firms to see and act upon.
4. Promoting inter-cluster linkages. For example, the biomass cluster in Thrace along with that for dairy products. This would provide more opportunities for profitable cooperation across clusters and would thus further enhance both the individual and joint productive opportunities.

However, notwithstanding limitations in implementation, the Greek example can be seen as a reasonably successful case of national policy towards the promotion of cooperation and clusters. We conclude that while it is difficult to replicate (a policy for) clusters, an industrial policy for the promotion of clusters looks promising, because clusters seem to provide an alternative way to increase productivity and competitiveness to that obtained through the promotion of economies of scale.

# NOTES

* We are grateful to Roger Sugden and Jamie Wilson for comments and discussion. We are also grateful to a large number of managing directors of the 'clusters' we examined.

1. For detailed SME definitions in many countries, see Asia–Europe SME Conference (1998). For an overview see Bianchi and Tommaso (1998, pp. 11–12). Here we adopt the definitions set by the EU, which identifies three categories of SMEs: medium-sized (50–250 employees), small (10–49 employees) and micro-enterprises (1–9 employees). Small firms' turnover should not exceed €10 million, and that of medium-sized ones should not exceed €40 million. Further, the firms should meet the independence criterion, i.e. no more than 25 per cent of their equity should be held by non-SMEs (see, for definitions, data and more details, Capaldo et al. (1998) and www.europa.int).
2. In downturns, or during demand fluctuations, SMEs may serve as a cushion to larger firms that subcontract part of their production process to them. Therefore, it may be crucial for some SMEs to employ flexible labour practices in order to survive. See Lucas (1978) for a mainstream treatment supporting this, as well as Piore and Sabel (1984) for their emphasis on small firm flexibility as a survival determinant in the face of increased uncertainty. See also Richardson (2003) on inter-firm specialisation in the economy and the importance of general-purpose intermediate products.
3. Penrose (1959) calls 'interstices' the small segments of a market where the entrepreneurs see and are able to exploit productive opportunities; see also Penrose (1959, 1996) on limits to size. Best (1990, p. 207) suggests that the rate of creation of new firms, especially those which emerge in response to Penrosean interstices within an industrial district, is an index of the district's dynamism and health. For an account on firm growth, on the process of concentration, and on the opportunities for smaller firms in the upswings of the business cycle, see Penrose (1959, pp. 215–65).
4. Much has been written on 'competitive bidding' of governments to attract transnational corporations (TNCs), a game played among uneven participants; see Pitelis (1994) for an overview and also Cowling and Sugden (1994, 1999). See also the chapter by Gilly and Perrat in this volume (Chapter 7), where they discuss the intricate governance dynamics that occur between local and global territorial scales. See also Sugden (1996) and Cowling and Sugden (1999) on multinational webs (defined as webs of smaller firms which cross national borders), and also Bianchi and Tommaso (1998, pp. 18–24) on the importance of 'openness' and transnational networks.
5. On deindustrialisation and relative economic decline, see Singh (1977), Blackaby (1979), Bluestone and Harrison (1982), Martin and Rowthorn (1986), Rowthorn and Wells (1987), Pitelis (1993), and *The Economic Journal* (1996). It is argued that industrial development based on large firms may contain inherent strategic failures relating to the number asymmetry between people taking decisions and those affected by them (Cowling and Sugden, 1994; Sugden, 1996; and Cowling and Tomlinson, 2000, for the case of Japan). For a related discussion of strategic failure, in the context of 'clusters', see also the chapter in this volume by Sugden et al. (Chapter 3).

6. Similarly to Sugden et al. in Chapter 3, we take clusters as a broad category which includes industrial districts, inter-firm networks, Japanese industrial policy cartels, webs, or related institutions, such as industrial parks, and so on.
7. For a detailed analysis of trust, and in particular its relationship with proximity, see Dupuy and Torre, Chapter 8 in this volume.
8. Bagnasco coined the term 'Terza Italia' (Third Italy), to distinguish the area of north-central and north-east Italy from the south of the country and from the heavy industrial area in the north-west. The Third Italy comprises the regions of Tuscany, Emilia–Romagna, Umbria, Marche, Veneto, Friuli–Venezia–Giulia and Trentino–Alto Adige.
9. These institutions were functioning as an industrial policy; see Best (1990, p. 38). For the case of Springfield Armory as an inadvertent industrial policy, see also Best and Forrant (1996).
10. This is in line with the approach taken by Henry and Pinch in Chapter 5 in this volume, for example. It is also related to the analysis of De Propris and Driffield in Chapter 6, who argue that the knowledge environment within clusters can strategically attract high-quality FDI from firms that are seeking to source knowledge.
11. See also Parrilli, discussing the potential of so-called 'survival clusters' in less developed countries, in Chapter 10 of this volume.
12. See also Bellandi, Chapter 4 in this volume, for an analysis of the relationship between clusters and public goods.
13. As noted above, we may also trace an explanation for cooperation in the transaction costs perspective, namely in the 'promise' contracting process. This perspective, though, takes the transaction as the unit of analysis. But the nature of transactions may change with the change in the perceptions or actions of entrepreneurs who see cooperation (i.e. the coordination of dissimilar but complementary activities) as a profitable productive opportunity. Hence this perspective with its instability trap cannot be of much help in understanding (the choice/emergence of) clusters.
14. Penrose defines as 'neighbouring areas' those that have two of the following three elements in common with the previous activity of the firm: market, technology and product.
15. In this light, cooperation can be seen to be superior to integration in terms of potential strategies ('productive opportunities') available to the members of the cluster. A cluster, due to its large number of 'participants', offers more opportunities for promptly reorganising production and redividing labour within it in the presence of environmental changes (see also Andriani, 2001). Cooperation (*à la* Richardson) between two firms by definition does not offer the opportunity to reorganise production (since cooperation ensues when the two firms possess different capabilities needed simultaneously for the production of a specific product). What is crucial is the number of firms and potential linkages that are there in a specific cluster. Along similar lines, another argument would be that firms involved in clusters may have enhanced prospects of increasing their knowledge base (hence their respective productive opportunities) compared to 'single-value-chain' integrated firms, due to the possibility of interaction with firms working in the same and other value chains (see Collins et al., 2002).
16. Similarly, cooperation might not always be the best choice of (Richardsonian) mode. A fuller investigation into the division of labour between market, consolidation and cooperation (and their respective productivity benefits) is an exciting research topic to be pursued. Here we only focus on the productivity benefits of cooperation explicable in terms of Richardsonian and Penrosean insights.
17. On this point see also, among others, Fischer and Reuber (2003). See also the chapter by Quintana and Pulignano in this volume (Chapter 9) for a discussion of the interface between industrial relations and clustering processes.
18. See also Porter (1998a), who suggests that information generated within a cluster is more relevant to the cluster's needs.
19. The common ownership of infrastructure, as well as the provision of 'real services' by institutions within a cluster, is a common theme throughout the literature on clusters; see Pseiridis (2001) for a discussion.

20. Apart from this, cooperation of firms may produce some assets (such as *ad hoc* services) which may be available to collocated firms; see Nicolini (2001).
21. This is especially aided by the use of Internet and communication technologies, which make interaction and communication less costly and, taken to the extreme, may induce the development of clusters with firms that are not really geographically close, that is, the development of 'virtual' clusters.
22. In what follows we were assisted by interviews with managing directors of clusters.
23. It should be noted that the ('formal') cluster carriers referred to here are smaller than the ('informal') cluster which comprises all the (informally) linked firms as well.
24. This might be explained with reference to the framework for analysing trust discussed by Dupuy and Torre in Chapter 8 of this volume.

# REFERENCES


Andriani, P. (2001) 'Diversity, knowledge and complexity theory', *International Journal of Innovation Management*, **5**(2), 257–74.

Asia–Europe SME Conference (1998), *The Role of SME: Asian and European Experience*. Conference Proceedings. Consorzio Ferrara Richerche, Ferrara.

Audretsch, D.B. (1998), 'Agglomeration and the location of innovative activity', *Oxford Review of Economic Policy*, **14**(2), 18–29.

Bagnasco, A. (1977), *Tre Italie. La problematica territoriale dello sviluppo italiano* [Three Italies. The territorial problematic of Italian development]. Bologna: Il Mulino.

Becattini, G. (1979), 'Dal settore industriale al distritto industriale. Alcune considerazioni sull' unità di indagine dell' economia industriale' [From industrial sector to the industrial district. Some considerations on the unity of research on industrial economics]. *Rivista di Economia e Politica Industriale*, **5**(1), 7–21.

Best, M.H. (1990), *The New Competition: Institutions for Industrial Restructuring*, Cambridge and Oxford: Polity Press.

Best, M. and R. Forrant (1996). 'Creating industrial capacity: Pentagon-led versus production-led industrial policies', in J. Michie (ed.), *Creating Industrial Capacity*, Cambridge and Oxford: Polity Press.

Bianchi, P. and M.R. di Tommaso (1998), 'The role of SME in a changing global scenario: Towards a new policy approach', in Asia–Europe SME Conference, *The Role of SME: Asian and European Experience*. Conference Proceedings. Consorzio Ferrara Richerche, Ferrara, pp. 9–28.

Blackaby, F. (1979) (ed.), *Deindustrialisation*, London: National Institute of Economics and Social Research/Heinemann.

Bluestone, B. and B. Harrison (1982), *The Deindustrialisation of America*, New York: Basic Books.

Brusco, S. (1982), 'The Emilian model: productive decentralisation and social integration', *Cambridge Journal of Economics*, **6**(2), 167–84.

Brusco, S. (1990), 'The idea of the industrial district: its genesis', in F. Pyke, G. Becattini and W. Sengenberger (eds), *Industrial Districts and Inter-Firm Cooperation in Italy*, Geneva: International Institute for Labour Studies.

Brusco, S. (1992), 'Small firms and the provision of real services', in F. Pyke and W. Sengenberger (eds), *Industrial Districts and Local Economic Regeneration*, Geneva: International Institute for Labour Studies.

Brusco, S. and D. Bigarelli (1997), 'Regional productive systems in the knitwear and clothing sectors in Italy: industrial structure and training needs', ESRC Centre for Business Research, University of Cambridge, Working Paper no. 51, pp. 1–57.

Brusco, S. and E. Righi (1989), 'Local government, industrial policy and social consensus: the case of Modena (Italy)', *Economy and Society*, **18**(4), 405–24.

Capaldo, G., C. Lo Storto and A. Marino (1998), 'SME in Europe: taxonomies and enterprise policies', in Asia–Europe SME Conference, *The Role of SME: Asian and European Experience*. Conference Proceedings. Consorzio Ferrara Richerche, Ferrara, pp. 299–309.

Collins, R., T. Dunne and M. O'Keeffe (2002), 'The "locus of value": a hallmark of chains that learn', *Supply Chain Management: An International Journal*, **7**(5), 318–21.

Cowling, K. and R. Sugden (1994), *Beyond Capitalism. Towards a New World Economic Order*, London: Pinter.

Cowling, K. and R. Sugden (1999), 'The wealth of localities, regions and nations: developing multinational economies', *New Political Economy*, **4**(3), 361–78.

Cowling, K. and P. Tomlinson (2000), 'The Japanese crisis – a case of strategic failure?', *The Economic Journal*, **110**, 358–81.

*The Economic Journal* (1996), 'Editorial note: controversy: deindustrialisation and Britain's industrial performance since 1960', **106**(434), 170–218.

Fischer, E. and R. Reuber (2003), 'Industrial clusters and business development services for small and medium-sized enterprises', in G. Wignaraja (ed.), *Competitiveness Strategy in Developing Countries: A Manual for Policy Analysis*, London: Routledge, pp. 131–65.

Foss, N.J. (1997), *Resources, Firms and Strategies: A Reader in the Resource-based Perspectives*, Oxford: Oxford University Press.

Hirst, P.Q. and J. Zeitlin (1989) (eds), *Reversing Industrial Decline: Industrial Structure and Policy in Britain and her Competitors*, Oxford, Hamburg and New York: Berg Publishers.

Humphrey, J. and H. Schmitz (1995), 'Principles for promoting clusters and networks of SMEs', paper commissioned by the Small and Medium Enterprises Branch.

Humphrey, J. and H. Schmitz (1996), 'The triple C approach to local industrial policy', *World Development*, **24**(12), 1859–77.

Humphrey, J. and H. Schmitz (1998) 'Trust and inter-firm relations in developing and transition economies', *Journal of Development Studies*, **34**(4), 32–61.

Inkpen, A.C. and E.W.K. Tsang (2005), 'Social capital, networks, and knowledge transfer', *Academy of Management Review*, **30**(1), 146–65.

Krugman, P.R. (1991), 'Increasing returns and economic geography', *Journal of Political Economy*, **99**, 484–99.

Krugman P.R. (1998a), 'What's new about the new economic geography?', *Oxford Review of Economic Policy*, **14**(2), 7–17.

Krugman, P.R. (1998b), 'Space: the final frontier', *Journal of Economic Perspectives*, **12**(2), 161–74.

Lawson, C. (1999), 'Towards a competence theory of the region', *Cambridge Journal of Economics*, **23**, 151–66.

Lazerson, M. (1990), 'Subcontracting in the Modena knitwear industry', in F. Pyke, G. Becattini and W. Sengenberger (eds), *Industrial Districts and Inter-Firm Cooperation in Italy*, Geneva: International Institute for Labour Studies.

Lucas, R.E. (1978), 'On the size distribution of business firms', *Bell Journal of Economics*, **9**, 508–23.

Malmberg, A. and P. Maskell (1997), 'Towards and explanation of regional specialisation and industry agglomeration', *European Planning Studies*, **5**(1), pp. 25–41.

Marshall, A. (1920), *Principles of Economics*, London: Macmillan. Available online http://www.econlib.org/library/Marshall/marP1.html from Library of Economics and Liberty, last accessed January 2006.

Martin, R. and B. Rowthorn (1986), *The Geography of Deindustrialisation*, London: Macmillan.

Maskell, P. and M. Lorenzen (2004), 'The cluster as market organization', *Urban Studies*, **41**(5/6), 991–1009.

Nicolini, R. (2001), 'Size and performance of local clusters of firms', *Small Business Economics*, **17**(3), 185–95.

Penrose, E.T, (1959/1995), *The Theory of the Growth of the Firm*, 3rd edn, Oxford: Oxford University Press.

Penrose, E.T. (1996), 'Growth of the firm and networking', *International Encyclopaedia of Business and Management*, London: Routledge, pp. 1716–24.

Piore, M. and C. Sabel (1984), *The Second Industrial Divide*, New York: Basic Books.

Pitelis, C.N. (1993), 'Transnational corporations, international organizations and deindustrialization', *Organization Studies*, **14**(4), pp. 527–48.

Pitelis, C.N. (1994), 'Industrial strategy: for Britain, in Europe and the World', *Journal of Economic Studies*, **21**(5), 2–92.

Pitelis, C.N. (1998), 'Productivity, competitiveness and convergence in the European economy: supply-side considerations', *Contributions to Political Economy*, **17**, 1–20.

Pitelis, C.N. (2001), 'Cluster diagnosis', presentation at Netwin project in London, December.

Pitelis, C.N., N. Antonakis, Y. Kaloghirou, Y. Katsoulacos, A. Lyberaki, D. Paraskevopoulos and L. Tsipouri (1997), 'Competitiveness and industrial strategy for Greece'. The Future of Greek Industry Project, Ministry of Development, Athens, Greece (in Greek).

Porter, M.E. (1990), 'The competitive advantage of nations', *Harvard Business Review*, March–April (reprinted in *M.E. Porter on Competition and Strategy*, A Harvard Business Review Paperback, pp. 69–89).

Porter, M.E. (1998a), 'Clusters and the new economics of competition', *Harvard Business Review*, November–December, pp. 77–90.

Porter, M.E. (1998b), 'The Adam Smith address: location, clusters and the "new" microeconomics of competition', *Business Economics*, **3**(1), 7–13.

Pouder, R. and C.H. St John (1996), 'Hot spots and blind spots: geographical clusters of firms and innovation', *Academy of Management Review*, **21**(4), 1192–225.

Pseiridis, A. (2001), 'Clusters as an industrial strategy', PhD thesis, University of Cambridge, UK.

Pyke, F. and W. Sengenberger (1992), (eds) *Industrial Districts and Local Economic Regeneration*, Geneva: International Institute for Labour Studies.

Richardson, G. (1972), 'The organisation of industry', *Economic Journal*, **82**, 883–96.

Richardson, G.B. (2001), 'Evolution, structure and strategy', DRUID working paper (available at www.druid.dk).

Richardson, G.B. (2003), 'The organization of industry re-visited', paper presented a the DRUID Summer Conference on 'Creating, sharing and transferring knowledge. The role of Institutions and Organisation', Copenhagen, 12–14 June (available at www.druid.dk).

Rosenfeld, S.A. (1997), 'Bringing business clusters into the mainstream of economic development', *European Planning Studies* **5**(1), 3–23.

Rowthorn, R.E. and J.R. Wells (1987), *Deindustrialization and Foreign Trade*, Cambridge: Cambridge University Press.

Sabel, C. and J. Zeitlin (1985), 'Historical alternatives to mass-production: politics, markets and technology in nineteenth century industrialisation', *Past and Present*, 108, August, pp. 133–76.

Schmitz, H. (1990a), 'Small firms and flexible specialisation in developing countries', *Labour and Society*, **15**(3), 257–85.

Schmitz, H. (1990b), 'Industrialisation strategies in less developed countries', *Journal of Development Studies*, **21**(1), pp. 529–66.

Schmitz, H. and B. Musyck (1994), 'Industrial districts in Europe: policy lessons for developing countries?', *World Development*, **22**(6), pp. 889–910.

Sengenberger, W.G.W. Loveman and M. Piore (1990), *The Re-emergence of Small Enterprises: Industrial Restructuring in Industrialised Countries*, Geneva: International Labour Organisation.

Singh, A. (1977), 'UK industry and the world economy: a case of deindustrialization', *Cambridge Journal of Economics*, **8**(2), 113–36.

Sugden, R. (1996), 'Multinational economies and the law of uneven development', Research Centre for Industrial Strategy, University of Birmingham.

Tallman, S., M. Jenkins, N. Henry and S. Pinch (2004), 'Knowledge, clusters, and competitive advantage', *Academy of Management Review*, **29**(2), 258–71.

Williamson, O.E. (1975), *Markets and Hierarchies: Analysis and Antitrust Implications: A Study in the Economics of Internal Organization*, New York: Free Press.

You, J.-I. (1995), 'Small firms in economic theory', *Cambridge Journal of Economics*, **19**, 441–62.

# 3. Clusters, governance and the development of local economies: a framework for case studies*

**Roger Sugden, Ping Wei and James R. Wilson**

## 1. INTRODUCTION

'Clusters' have been an increasingly prominent item on the development agendas of local economies throughout the world. As reflected in a number of the other contributions to this volume, however, they have also been the subject of growing scepticism focused on fundamental concerns about their conceptual, theoretical and empirical underpinnings. In line with these doubts, we suggest that the majority of existing methodologies for the analysis of clusters tend to centre on relatively superficial features. This, particularly in its implications for the policy agenda, has revealed itself in an over-concern with narrow evaluations of traditional quantitative characteristics that, for example, stress the aggregate output of a cluster, the creation of new jobs, or the number of new enterprises. Moreover, associated with these deficiencies, policy makers and planners have been led into attempts to appeal to clusters as a panacea for their economic ills without recognising that each cluster has important qualitative characteristics. These might include the power relationships amongst its (actual and potential) actors, its external links, and its essential impacts on the development of local economies.

In contrast, this chapter suggests a framework as the basis for guiding case studies on clusters that are centred around governance and learning in the development processes of local economies, issues that imply a corresponding policy perspective. For us, it is not clusters *per se* that are of interest, but their role in and impact on the development of local economies. The framework uses a strategic decision making approach. It leads to a specific view on the impact of clusters on the development of local economies and simultaneously goes beyond the traditional geographical and industrial boundaries of cluster analysis.

The chapter explicitly follows the general case-study framework provided by Branston et al. (in the Appendix to this chapter) for analysing the development of local economies and the possible impact of public policy; they suggest the possibility of concentrating case studies on actual/possible/alleged 'clusters' and their impact on the development of a locality. In line with that, the objective of our approach is to draw out key issues and detailed topics that are especially critical to the role of clusters.

The chapter proceeds as follows. Sections 2 and 3 present the context, rationale and theoretical imperative underlying our framework. Section 4 explores in detail its key issues and specific topics. Concluding comments are presented in Section 5.

## 2. CONTEXT AND RATIONALE

Since the early 1980s, yet rooted in research with a much longer pedigree, clusters have become the subject of a large literature. This has been motivated not least by the apparent success of Marshallian-type industrial districts in Italy (Becattini, 1978, 1990, 1991; Piore and Sabel, 1984; Brusco, 1990; Dei Ottati, 1991); by the experience of 'Silicon Valley' (Saxenian, 1994); by the likes of Toyota City and Sakaki in Japan (Ohno, 1988; Friedman, 1988); and by the more recently noticed 'town and village enterprises' (TVEs) of China (Christerson and Lever-Tracy, 1997; Putterman, 1997). Clusters of one form or another have been identified in many parts of the world, and have been associated with major productivity growth and employment creation. They have attracted researchers from different disciplines, and have been associated with a so-called 'geographical turn' in economics (Martin, 1999, p. 67).

For example, neoclassical economics has taken Marshall (1907) as its starting point for analysing industrial clustering. His conceptualisation of external economies has been extensively developed to explain agglomeration processes and the economic gains from clustering. A key focus of research has been to concentrate on identifying the nature and forms of the external economies associated with geographical proximity. For instance, Scitovsky (1954) focused on pecuniary external economies, the interdependence gains captured by firms through the market mechanism following, for example, another firm's new investment.[1] Within location theory, the argument is mainly associated with cost-based externality analysis (Storper, 1997; Gordon and McCann, 2000). More recently, Krugman (1991) has identified three benefits from industrial localisation, centred on labour market pooling, intermediate inputs and technological spillovers. Other theorists, most especially in Italy, have placed emphasis on qualitative dimensions

such as trust, embeddedness, interdependence, the mix of cooperation and competition, and the role of institutions. These factors have been claimed to explain the strength and dynamics of the 'Third Italy', and an outcome has been a socio-economic model of industrial districts (Harrison, 1992). A further theoretical perspective starts from competitive advantage. Most notable is Porter's (1990, 1998) promotion of 'industrial clusters' in the context of the competitiveness of particular locations. This has had significant influence on policy makers and has greatly promoted the concept of clusters as a key policy tool for local and regional economic development (Kotval and Mullin, 1998; Martin and Sunley, 2003).[2]

However, there has been scepticism around clusters; there have been fundamental 'conceptual, theoretical and empirical' (Martin and Sunley, 2003, p. 5) questions doubting their validity or usability in shaping economic development policy. For example, while industrial clusters have long been seen as 'centres' of growth and innovation or as 'poles' (Perroux, 1965; Boudeville, 1972; as interpreted by Czamanski and Augusto, 1979), why is it that some can sustain their growth and dynamism while others are characterised by 'lock-in' and recession (Grabher, 1993)? More fundamentally, what exactly is a cluster? Martin and Sunley (2003, p. 8) argue that there is a 'chaotic' use of the term cluster, in the sense of 'conflating and equating quite different types, processes and spatial scales of economic localization under a single, all-embracing universalistic notion'. They claim that this has resulted from the definitional incompleteness of Porter's conceptualisation. Explicitly or implicitly, and starting from different theoretical points, others have also expressed their doubts about a uniformity to the concept that is often more or less presumed (Amin and Robins, 1990; Markusen, 1996; Gordon and McCann, 2000).

Moreover, despite recent concern with an institutional approach that signals a shift towards exploring the deeper internal mechanisms of the dynamics of industrial district models, Harrison (1992, 1994) questions the stability and sustainability of institutions within clusters, and thus the stability of districts. Through exploring a number of cases, he claims that in some industrial districts the largest firms have become vertically and horizontally integrated; market share has been increasingly concentrated in the hands of a few firms and there has been a move towards 'more concentrated, asymmetric and unbalanced forms of organization and system governance' (1992, p. 478). Markusen (1996) also explores this concern with governance. She (p. 297) points to the importance of the 'presence (or absence) of distinctive and lopsided power relationships, sometimes within the district and sometimes between district entities and those residing elsewhere'. She thereby cautions against 'singular enthusiasm' for a dominant Marshallian paradigm. Further, reflecting similar concerns

and explicitly building upon the same sort of foundations as we develop in Section 3, Whittam and Danson (2001) promote a radical Coasean framework to identify the nature of power relationships within the Scotch whisky industry.

However, a concern for such qualitative relationships and their evolution among the actors of clusters does not seem to have received very much attention. The topic has not been pursued much further in recent literature, and such issues are clearly not the focus of existing methodologies. In part this might be associated with the view that, although different researchers have various theoretical starting points, policy makers and planners centre on their research results without recognising that initial variation. A consequence is that methodologies for analysing specific cases have failed to recognise important causal factors.

A fundamental concern for us is that the majority of existing methodologies tend to centre on what we consider to be relatively superficial features. For example, the neoclassical perspective on regional economics has a basic preoccupation with 'pure and perfect market competition' (Harrison, 1992, p. 476), relegating social, cultural and political factors to very minor or even non-existent roles. This is an approach that is strained to breaking point as a tool for exploring the striking socio-economic characteristics of industrial districts. Consider also Porter's (1990) 'diamond' model. This provides a seemingly practical approach to identifying the weaknesses and strengths of local clusters by concentrating on four determinants of locational competitive advantage: factor conditions, demand conditions, firm strategy and rivalry, and related and supporting industries. Nevertheless, it continues to centre on markets and competition, with the objective of improving firms' performance in competition, and thus the performance of the locality. Moreover, even the 'network' approaches (Powell, 1990; Uzzi, 1997; Staber, 2001) that emphasise linkages among actors have failed to address fundamental concerns, such as: how does the assumed trust and cooperation within the clusters vary across firms, sectors and areas?; who essentially decides on the kind of linkages?; why does a linkage appear in one form and not another?; what impacts do the linkages have on cluster development?; and how are the relations between local and global networks evaluated? Existing methodologies are still not even close to delivering an in-depth analysis of such considerations.

These approaches, particularly in their consequences for the policy agenda, have resulted in an over-emphasis on the narrow evaluation of traditional quantitative characteristics, for example by giving special stress to the aggregate output of a cluster, its number of new jobs, or its number of new enterprises. Accordingly, this narrow evaluation of relatively superficial attributes, when widely applied to case studies of successful

clusters, has led to an assumed association of the label 'cluster' with favourable provision of employment, encouragement of entrepreneurship, and so on, as well as to the label being equated with facilitating long-term, dynamic regional development. From there it seems to have been but a short step for policy makers to appeal to clusters as a panacea for their economic ills without recognising the important evolution of their vital qualitative characteristics.[3]

It is in this context that we are concerned to find a suitable way forward. Our suggestion is that a methodology for analysing clusters must recognise as its starting point that the term has been applied in practice to experiences that are extremely varied, and that in principle it is desirable to be able to analyse any of these experiences so as to understand the fundamental determinants of their impact. To highlight these determinants, we would suggest that one possibility is to root analysis in a perspective on the development of economies, to view the concern with clusters as derived from broader and more basic issues regarding development. For us, it is not clusters as such that are interesting and potentially important; it is what they might imply for the development of economies.

In line with this, in the next section we develop a theoretical imperative, using existing literature to present a perspective on the development of economies and the consequent centrality of governance, and therefore to introduce key issues for the analysis of clusters. First, however, we present a brief explanation of what we mean by the term 'cluster'.

## 3. THEORETICAL IMPERATIVE

We share the view of Martin and Sunley (2003) on the chaotic use of the term cluster. There is also considerable confusion in the literature concerning the use of related terms such as 'industrial district', 'industrial complex' (Czamanski and Augusto, 1979), 'socio-territorial industrial system' (Courlet and Pecqueur, 1991), 'innovative milieu' (Camagni, 1995) and 'new industrial space' (Scott, 1988). However, while Martin and Sunley implicitly appeal for a narrowing down of the conceptualisation by delineating geographical and industrial boundaries, we fear that this would risk missing potentially significant cases. As we will subsequently argue, for us the key aspects of clusters do not include their geographical or industrial boundaries, other than if these are a constraint on their activities and therefore impact. Rather, it is their governance that is most especially relevant.

Like Pitelis and Psieridis, therefore, our concern with clusters starts from a very general notion: there is a cluster in a locality if that locality has a set of interconnected organisations/institutions focused on related production

activity. This incorporates a wide range of cases, such as company towns and Benetton-type monopoly clusters. Not only does it include Italian and German vertically disintegrated small firm networks, but also Toyota City, Route 128, the Los Angeles garment district and the Hollywood entertainment industry. Even new industrial and science parks qualify as 'clusters'.

Of course, such a general definition does not take the analysis very far. To move beyond this and begin to distinguish between the impacts of the many different types of cluster, we need to identify the fundamental economic issues that we are interested in.[4] This will provide our foundation for examining clusters; it enables us to consider why clusters might matter at all.

## 3.1 The Governance of Development and Strategic Decisions

In their general methodology for analysing the development of economies, Branston et al. (in the Appendix to this chapter) begin from a concern with the governance of development processes. The rise of the governance paradigm in the social science literature is only recent (Jessop, 1998). Though originally its usage and understanding were mainly associated with the conduct of 'government' in maintaining public order within a political economy agenda, recent theoretical work has greatly widened the conceptual scope to embrace many different contexts.[5]

According to Kooiman and Van Vliet (1993) the concept of 'governance' 'points to the creation of a structure or an order which cannot be externally imposed', rather one which results from the continuous interaction among governing and other actors (p. 64). The interest in relating governance to some sort of order can also be found in Jessop (1998), suggesting that a wide definition of 'governance' can refer to 'any mode of coordination of interdependent activities' (p. 29). This includes the anarchy of exchange, organisational hierarchy, and self-organising 'heterarchy'.[6] In more restricted meaning, however, Jessop only defines the concept in terms of heterarchy or self-organisation modes of coordination. The participants in governance activities can therefore include public organisations/institutions – such as government at different levels – and also private organisations/institutions and persons that are operationally autonomous yet interdependent. For him, the objective is to explore the roles of markets, states and partnerships in economic coordination. Thus the discussion specifically encompasses economic development analysis. Moreover, Jessop (1998) points out that the growing interest in governance reflects fundamental shifts in economic, political and social life. Though research on governance is still eclectic, diverse and relatively separated, it is recognised that the perspective of

governance analysis has a value in its capacity to provide an 'organising framework' and fresh insights into reality (Stoker, 1998, p. 18).

It is agreed that the mode of governance an economy is using depends on many conditions. Further, in practice there could be a complex combination of forms. From Stoker's (1998) point of view, the essence of governance lies in mechanisms that do not depend on the authority and sanctions of government. With regard to our concerns on the governance of development, however, and following Sugden and Wilson (2002), we would argue that the essence of governance is its focus on 'strategic decision making' power and processes. Thus we now turn to a discussion of strategic decisions, before looking more specifically at the governance of development processes within this framework.

While a decision generally refers to a choice among alternatives, strategic decisions specifically refer to certain key choices. In the context of the theory of the firm, strategic decisions are claimed to be the pinnacle of a hierarchical system of decision making, and essentially different from those decisions at operational and working levels (Pitelis and Sugden, 1986). Thus, following Zeitlin (1974), the power to make strategic decisions implies the ability to determine broad corporate objectives, including the direction of production and relationships with other corporations, governments and localities. To make strategic decisions is to govern the firm. Based on the crucial importance of strategic decisions in determining a firm's activities and impacts, Cowling and Sugden (1998) propose that a modern, large corporation can be conceptualised as a means of coordinating production from one centre of strategic decision making. Accepting this definition implies that the boundaries of a particular firm go beyond legal limits. Both market and non-market exchange – for example, subcontracting relationships – may fall within the ambit of a single firm. Moreover, from an economic perspective, in the presence of imperfect competition the strategic decision makers' concerns encompass far more than transaction cost considerations.

Cowling and Sugden (1998) conclude that 'the strategic decision making approach focuses on the objectives and thus decisions of strategic decision-makers as a crucial determinant of activity in modern economies' (p. 61). This implies an emphasis on the strategic decision making process, rather than the 'content' of strategic decisions as such. For it is the process (who is involved in the strategic decision making and how the decisions are made) that essentially determines the content and impact (Branston et al., 2006).

This analysis enables us to explore governance in the framework of strategic decision making. The governance of a local economy, its forms and objectives/directions, is subject to related strategic decisions. Building on

the assumption that decisions are undertaken in the interests of the decision makers, the key issue then turns crucially on who has the capacity to be involved in strategic decision making processes, and on who has the capacity to dominate over others within these processes. In turn, these issues will determine the impacts produced by the actual decisions. A strategic decision making process dominated by specific actors implies an unbalanced power distribution among the actors involved, indicating a form of hierarchy.[7] In this situation, access to a strategic decision making process is limited and exclusive, which falls within Jessop's (1998) notion of organisational hierarchy. In contrast, if access to a strategic decision making process is open, then strategic decisions may be based on the common interests of related actors, indicating a possibly democratic form of decision making.

By examining the process of participation in strategic decisions, we can therefore identify how governance modes are differentiated across different localities. That is, we can identify whose decisions and 'objectives' are being reflected in current economic processes, and thus determine different impacts on the locality both in the short term and long term. After all, any local economy is subject to particular strategic decisions and to specific interests that essentially decide the direction that locality takes in pursuit of its prosperity.

To summarise, governance is central to the development of an economy. An approach to understanding the essence of governance is through the understanding of strategic decision making processes. A key argument, however, is that only certain forms of governance are more suited to maintaining democratically determined development paths. Localities operate in the context of a 'global' economy and within this they might choose to pursue certain aims and objectives. Moreover, it has been suggested that the goals and processes of development cannot be homogenised; that the meaning of 'development' should be derived from communities that are seeking to develop, rooted in their cultures and hence in their specific aims and desires (Sugden and Wilson, 2002). The implication of adopting this perspective is a focus on ensuring development that is meaningful to people, suggesting an approach that centres on the peoples of a locality identifying and pursuing their own aims and objectives, and participating in its governance. It is an approach that affords a special concern with guaranteeing the full participation of people and communities in related strategic decision making processes; that is truly democratic, rather than governed by the interests of a few. For example, Sugden and Wilson (2002, 2003) note that the failure of the 'Washington Consensus' development agenda might fundamentally derive from a failure to engage people in the decisions and processes surrounding their development. In contrast, they

suggest a democratic governance path characterised by non-hierarchy and wide-ranging participation in governance processes.[8]

Such a view could be taken further, with implications for 'learning' beyond traditional interpretations. What would be at issue is learning that concentrates on the ability of each individual to become involved in the decision making processes that shape the development path of their locality. It is the learning that takes place when people, firms and institutions interact with each other, and that consequently enables each actor to have an input into the governance of their locality. Most importantly, it signifies an essential shift from passive activity (subject to governance) to proactive activity (participating in governance).

## 3.2 Governance and Clusters

This concern with the centrality of governance in terms of strategic decision making in the development process leads to a specific perspective on the analysis of clusters, and on their potential impacts.

The embeddedness of interrelated economic and social relationships as a key feature of some successful clusters has long been recognised (Becattini, 1991). This is usually expressed in terms of the trust and interdependence of firms. However, the focus could be different: in practice a cluster might be seen as a form of economic organisation that is in some sense embedded in the specific 'locality' or 'community' where people *live* and, as part of that life, engage in production (i.e. work). In this situation, the relationships among the actors of a cluster (including its firms, but also encompassing its other organisations and institutions, and its individuals) necessarily appear as economic but also as social, political and cultural. Therefore, not only will the impact of an actor in the cluster exceed narrowly defined 'economic' concerns, but also the functioning of the cluster will essentially be a part of the locality, rooted in and derived from the concerns of that locality.

As we have seen, clustering is often viewed as a route to economic and social well-being, there being many examples of successful clusters that bring much to their localities. However, if governance is seen as central to the development of economies, then an implication is that governance is also central to the impact of clusters on that development. It therefore follows that the impact of clusters on economic development is determined by the way in which economic development and therefore clusters are governed. This essentially suggests that an analysis of clusters should pay special attention to how they are governed.

Consider, for example, one potential impact of clusters: that on employment. The stimulation and development of clusters of firms, or more interestingly clusters of economic actors, can be seen to entail many

approaches to employment generation. Possibilities might be suggested by a neoliberal model of attracting foreign direct investment, by a statist model of funding national enterprises and programmes, or perhaps by a combined approach – such as that implied by China's TVEs. Another option might be to follow the model of clustering seen in the 'industrial district' experiences of the Third Italy. Each will have a different impact on the forms of employment that are generated, and further implications for paths that might be taken in the future, and particularly the governance of those paths.[9] A key argument is that only certain forms of employment generation, thus certain forms of cluster, appear to be especially suited to the attainment of economic democracy. In turn, this is seen as central to achieving 'prosperity' that meets the desires of local communities in a globalised economy.

Concern with governance also points to both a starting point and a path forward for analysing the type of network relationships that exist between actors within a cluster, and also across actors within and outside a cluster. Who is involved in the linkages and networks of a cluster? How are strategic decisions taken among those actors? Who has the power to make strategic decisions that affect others? These are the sorts of questions that are of crucial importance to understanding the essence of relationships in a cluster; and thus to distinguishing between different types of clusters, and to understanding the central determinants of the impact of a cluster on local economic development.

In the literature on clusters, perspectives on governance structure/forms are usually implicitly demonstrated in the exploration of cooperation and competition in production; see, for example, Best's (1990) notion of 'new competition' as discussed in some detail in the chapter by Pitelis and Pseiridis (Chapter 2). In particular, it is argued that within districts regulatory mechanisms appear as a mixture of market and non-market forms (Becattini, 1991; Dei Ottati, 1991). Dei Ottati (1991, p. 68) sees a mixture of two 'invisible hands': 'the market and the community'. For her, 'a combination of the price system and the practice of mutual adaptation' coordinates and governs the transaction activity within the districts. Many scholars (for example, Lazerson and Lorenzoni, 1999) emphasise the causal role of long-term relationships and of trust as non-market governance mechanisms.

It appears that the literature on industrial districts, especially Italian cases, has emphasised the presence of self-organised networks characterised by symmetric relationships and the absence of vertically integrated firms. As Brusco (1990, p. 14) explains: 'the fact that the firms connected to the final market are numerous, and independent of one another, prevents the district from having one single head'. It is claimed that interdependence (and trust) and the pressures of inter-firm competition impede the formation

of 'elite' decision-making cartels that squeeze other firms through price or other factors. Alongside this there is a common perception that the 'industrial atmosphere' of many clusters tends to help fuse competitive and cooperative relationships, contributing to less hierarchical and more democratic decision making processes, perhaps delivering a path towards economic democracy. A danger with this perception, however, is that it can be assumed to apply wherever the title 'cluster' is used. An obvious problem raised by this is the lack of appreciation of the variations across different types of cluster because there is inadequate understanding of the network relations indicated by strategic decision making processes within and across the actors. For example, Dupuy and Torre in this volume (Chapter 8) provide an illustration of why the concept of 'trust' cannot simply be assumed to apply in the same way in all clusters; their analysis points to a distinction between 'interpersonal confidence', 'community confidence' and, most interestingly from our perspective, 'hierarchical' forms of trust. In a similar vein, Henry and Pinch in Chapter 5 point to the uniqueness of each cluster that stems from the complexity of knowledge relationships, and Di Tommaso et al. in Chapter 13 observe that no single model of 'high-tech' clusters has proved successful.

In addition, whether symmetric relationships can be sustainable over time is still an open question. For example, it is reported that the Bologna-based SASIB – Italy's second-largest manufacturer of cigarette-packaging machinery – used its bargaining power to squeeze local suppliers over prices and information (Lazerson and Lorenzoni, 1999). Furthermore, in the Die and Mould Industry Association in the Ota Ward of Japan, a survey (Whittaker, 1997) shows that small firms have felt that the large companies have dominated the Association. There is a perception that they are not really concerned with dies and moulds, unlike the small firms, and thus that the research funded by the Association has gone far from small firms' interests.

To sum up, our theoretical perspective on the development of economies, the significance of governance and therefore the role of learning, suggests that the types of cluster that are particularly interesting are those with a potential for forging non-hierarchical, democratic relationships among economic actors within a locality. That is not to say that even within apparently democratic forms of cluster chains of dependence and hierarchy will not emerge. But there is a need to guard against such tendencies if the form of development of local economies that is actually undertaken is to reflect the desires of the local people today, and also if it is to allow their views to be reflected in the future.

Also significantly, our approach implies a need to understand the qualitative relationships between, on the one hand, the actors in a particular

cluster in a locality, and, on the other hand, the associated non-local actors (including firms and organisations/institutions in clusters in other localities). The objective is to identify the real strategic decision makers; they can be internal or external to the locality of a cluster, within a nation or across nations. In short, we recognise that the strategic decisions affecting clusters may be made from within the cluster but perhaps by a subset of interested parties, or there may be governance from outside the locality. In this respect, the approach goes beyond the traditional geographical or industrial boundaries of the analysis of clusters and avoids the limits of many methodologies that are overly concerned with endogenous growth.

This is especially meaningful in a 'globalised' economy. To be sure, the increasing spatial dispersion of production activities and networks under globalisation is a fact. But the key question is whether or not this means that the power to make the crucial strategic decisions is also dispersed. Harrison (1994) considers the spread of production networking as merely a dramatic change in the methods for managing global reach. Actually, power, finance, distribution and control remain concentrated among the big firms, which he calls 'concentration without centralisation' (p. 9). Most importantly, according to Cowling and Sugden (1998), strategic decisions in major corporations continue to emanate from one centre and an elite. Though many clusters appear to be highly localised, in the context of a globalised economy they are and are likely to be increasingly involved in global patterns of the division of labour. In this sense, the more dependent they become on external markets, the more local network and governance structures will be influenced by external strategic centres. Consider, for example, that while there is a tendency for transnational corporations to try to recreate their supplier clusters abroad and attain local network benefits, there are dangers that these clusters as a whole may become dominated by the transnational manufacturer's decisions.[10]

Finally, we would stress that this concern with the qualitative nature of clusters also necessitates a multidisciplinary perspective. Relationships are not only economic, but also social and political, and rely on factors such as spatial, cultural and mental proximity. This signals the need for a truly multidisciplinary analysis, capable of fusing different perspectives in order to analyse the different impacts of clusters, and of public policy around clusters.

## 4. KEY ISSUES AND DETAILED TOPICS

Given its theoretical context and imperative, the focus of our framework is on uncovering the breadth, depth and nature of governance in terms of strategic

decision making. It seeks to position clusters in the context of the overall development of local economies under globalisation. More specifically, the focus is on networking relationships both within a particular cluster of firms in a locality, and between those firms and other local and non-local actors (including firms and organisations/institutions in clusters in other localities). This is in line with the general approach by Branston et al. (in the Appendix to this chapter) for conducting case studies in the development of local economies. Founded on this general approach, therefore, our framework for analysing clusters centres around five key issues: the cluster and the locality; linkages and networks; learning; cluster governance; and public policy. These key issues are briefly highlighted in Section 4.1 and, within those, more specific topics are identified in Section 4.2.

## 4.1 Key Issues

A. *The economic background to the presence and development of a cluster in a particular locality.* What are the principal economic characteristics of the locality? What are the mix and impact of firms of different sizes within the cluster? What is the availability of health services?[11]
B. *The actual and potential networks that span the cluster.* What linkages exist across actors within the cluster and between actors within the cluster and those in other localities? Are actors in the locality involved in networks that impact on the development of the cluster?
C. *Cluster governance.* Who governs and to what effect in each of the actors and networks in the cluster?
D. *The extent and provision of, and entitlement to, learning within the cluster and the locality.* What is the availability of different types of education? Are there effective means of communicating ideas across actors within the learning sector?
E. *The extent and impact of public policies – at local, national and international levels – on the above.* What public initiatives for clusters are currently in force? Do they impact on the development process, and are there opportunities for improvement?

## 4.2 Detailed Topics

In using this framework to analyse specific cases, information needs to be accessed and ordered according to the key issues. Details on the topics that might be considered under each of these issues are provided below. It should be emphasised, however, that our intention is merely to present clear and precise guidelines. It is not to be rigid. Rather, the detailed topics

include the need to reassess, to narrow down, to guard against errors and omissions through feedback.

Topic A covers the contextual background of the case. Topics B to E pursue the issues we see as especially important within that context.

**A. The cluster and the locality**

A brief description of the locality to provide the background and context for the study, focusing on:

- The overall economic, social, political, geographical and cultural background to the cluster, including a historical perspective and a comment on the infrastructure.
- The number of firms in the cluster, by size (number of employees, turnover), ownership type (for example, sole traders, partnerships, public limited company), production process and sector. The identification of any especially prominent actors or groupings within the cluster.
- Identification of the significant non-firm actors/influences in the cluster. These include governmental institutions, non-governmental institutions, financial institutions, educational and health institutions, and international agencies. Also interesting is the possible presence of a broader range of associations, forums and activities where people meet in common function and/or where ideas are exchanged. Included in these are local trade associations and trade unions, service centres, science parks, media, youth/activity/community groups, sports clubs, religious gatherings/churches and other interest/pressure groups.
- Aggregate indicators for the cluster and for the locality over recent years, notably as regards employment and unemployment; output; value added; exports and imports; productivity; innovation; investment; immigration and emigration; dependency ratios and demographics.
- The availability of health services in the cluster and the locality, including financial and other constraints on access to health processes. Health levels of the population.
- Identification of the opportunities for and constraints on the cluster resulting from the characteristics of the locality, including, where applicable, the extent, composition and impact of the informal sector.

**B. Linkages and networks**

Evidence of actual and potential networks involving firm and non-firm actors in the cluster and locality, focusing on:

- Linkages (both formal and informal) between actors within and across sectors. These might include ties over trade – such as common marketing and purchasing, forward and backward industrial linkages or subcontracting relationships – as well as ties over investment, research and development, and joint activities in the pursuit of public support (for example, European Union funding).
- The membership and activities of significant non-firm actors in the cluster and the locality, such as trade associations, as a gauge to the extent and characteristics of relationships across the economy.
- Linkages (both formal and informal) with economic actors in other localities, including in different nations.

**C. Cluster governance**

In certain respects this issue is the fulcrum of the case study, focusing on:

- Decision structures of the cluster, including of its firms and non-firm actors. This includes identification of who is involved in making the decisions, and thus of dominant sectors, firms or non-firm actors within the cluster.
- Evidence on the actors involved in making strategic decisions in the cluster, specifically on where those decision makers are based (within or outside the locality), how decisions are taken, and on whose interests are taken into account. Included in this is the influence of interest groups (local/national/international, and concerned with issues that affect the cluster).
- The ownership structures of firms operating in the cluster, highlighting whether firms tend to be owned by individuals, families, governments, institutions, other firms, workers or cooperatives, and commenting on where those owners are based geographically.
- Cooperation and conflict between actors in the cluster in making strategic decisions be it among themselves and/or with others. In part this is a focus on the governance of networks with which the cluster is involved, establishing, for example, if one or a few of its constituents dominate a network's strategic decision making process, or if there is broad participation. In part, the concern is whether actors integrate and coordinate their activities. For example, whether firms influence strategic decisions in learning and health institutions to ensure that their needs are met, or if one sector (perhaps finance, for instance) is seen to constrain others inappropriately.
- The existence of mechanisms, processes and social norms that serve to self-regulate relationships within the cluster, and their influence on governance.

- The significance of forums and channels for interested parties to represent their views on strategy to firms and other actors in the cluster. These might include the use of media, discussion groups, planning enquiries, consultation exercises and regulatory agencies.
- The constraints and influences on strategic decisions that stem from forces external to the cluster and its locality, for example from international agencies such as the World Trade Organisation, the World Bank, the International Monetary Fund, the United Nations and the European Union.

**D. Learning**

The levels and process of learning are the particular concerns, focusing on:

- The existence of networks between actors within the cluster and the locality for the purposes of learning and knowledge generation.
- The availability of education in the cluster and locality, including: the numbers in school, and in further and higher education, as a proportion of their respective age groups; the duration of compulsory education; the extent of vocational training programmes; and financial and other constraints on access.
- Attainment levels in education, in their national and international contexts.
- The provision of training by firms and industry organisations in the cluster, including its effectiveness, budgets by sector and firm size, and the provision of public support.
- The generation of new knowledge in firms and in other institutions in the cluster, including investments in R&D (by firm size), the amount of research funds directed to local educational institutions (in absolute terms and relative to amounts elsewhere), and the ability to take advantage of the knowledge generated.
- The degree to which new knowledge is accessible by interested actors in the cluster and the locality.
- Access to and use of communication media (including libraries and the internet) for different actors within the cluster and the locality.

**E. Public policy**

A description focusing on:

- An outline of the apparently significant public policies (including laws, regulations, and joint actions across private organisations/institutions) that are currently in force in the cluster and its locality, whether these be local, national or international initiatives.

- The decision making processes for determining these public policies.
- The impact of these policies on the cluster, including: evidence on whether or not particular policies are actually implemented; on whether or not affected actors are aware that the policies exist and, if so, were involved in their formulation; and (where available) quantitative and qualitative data.

## 5. CONCLUSION

Our concern with clusters began with an analysis relating strategic decision making to the governance of development. Starting from a very general notion of clusters, this chapter has sought to offer a framework for case studies that fits within this theoretical context and imperative, and thus contributes to methodological exploration in regional analysis.

The framework essentially differs from others in that governance in terms of strategic decision making and therefore learning are its focal points. It aims at identifying the real strategic decision makers or centres, and at relating the cluster to the development path implied by pursuit of the aims and objectives of local people and communities. The consequences for national and regional economic development policy from such an approach are fundamentally different from other approaches. For example, some current methodologies emphasise the role for nations and localities in supporting industrial infrastructure to attract new firms and thereby facilitate the development of local clusters; some other methodologies emphasise the role of institutions in providing training, consulting services and funding. In our approach, however, this could deflect from more fundamental requirements. Without giving special attention to the governance of the development process and guaranteeing the participation of people and communities in strategic decision making, any development will be flawed.

It is clear from our discussion that the label 'cluster' encompasses many different types of production organisation. A concern for future research is therefore to identify key characteristics and requirements of forms of cluster that would be especially significant for the attainment of economic prosperity. This, we argue, requires an analysis of clusters in line with the framework that we have presented, and needs to be pursued through the collection of information around specific cases. However, our reading of the existing literature reveals that fundamental issues are ignored in current casework. In particular, there is relatively little on governance in terms of insights related to strategic decision making processes. Our identification of key issues and detailed topics has particularly focused on these omitted

concerns. In suggesting detailed topics, we have provided guidelines for the collection of new information, presenting a major challenge for further work. There are certainly practical difficulties in identifying suitable techniques and processes for capturing the influence of strategic decisions,[12] and these are methodologies that will need to be taken up in the future if this challenge is to be met. However, the chapter in this volume by Sacchetti and Tomlinson (Chapter 11) represents a valuable attempt at applying this framework to a comparative analysis of two well-established clusters facing current difficulties, and signals a way in which such analysis might proceed in the future.

# NOTES

* We would like to thank Marco Bellandi, Paul Cheeseright, Lisa De Propris and participants at the workshop on 'Spatial Networks and Clusters', Reus, Spain, 6–8 March 2003, for comments.

1. However, it is worthwhile to highlight that Scitovsky's definition of 'pecuniary external economies' inherently does not have a spatial dimension. His analysis implies that pecuniary externalities can arise among actors in the same locality, but also among actors in different localities.
2. See also Pitelis and Psieridis in this volume (Chapter 2) for a detailed analysis of the large theoretical literature surrounding clusters, and, more specifically, Aranguren et al. (Chapter 12) for discussion of a policy application of Porter's framework in the Basque Country region of Spain.
3. Related criticisms of current approaches to clusters are made in this volume by Henry and Pinch (Chapter 5), for example, and also underpin the rationale for Pitelis and Psieridis's development of a new conceptual framework in Chapter 2.
4. Bellandi, in this volume (Chapter 4), discusses conceptual definitions of clusters in some detail, as do, variously, Henry and Pinch (Chapter 5), Parilli (Chapter 10) and Pitelis and Psieridis (Chapter 2). Our concern to distinguish between different types of clusters and their impacts is supported, for example, by Bellandi's observation that the term 'cluster', when referring to a mix of cooperation and competition in related productive activities, actually corresponds to a very large set of phenomena.
5. See *International Social Science Journal*, **50**(155), March 1998, for a wide discussion on governance. See also the chapter in this volume by Gilly and Perrat (Chapter 7) which focuses on the interlinkages and tensions between local and global governance.
6. Jessop (1998) claims that the distinction between 'governance' and 'government' lies in the former referring to the modes and manner of governing, which are not necessarily associated with government, while the latter means the institutions and agents responsible for governing and their related governing activities. Further, in Stoker's (1998) opinion, governance is concerned with 'creating the conditions for ordered rule and collective action' (p. 17). Thus the two concepts do not differ in outputs, but rather in processes.
7. As Whittam and Danson (2001) comment, 'wherever there is a decision making process in place where a decision is taken against the wishes of one of the partners in the cluster then an exercise in power has been undertaken' (p. 952).
8. Such an approach would appear to be inconsistent with what Gilly and Perrat (Chapter 7) see as a current 'weakening of practices based on negotiation and on the development of true social compromises, to be replaced by a concerted drive towards "problem-solving" logic'.

9. For example, in their analysis of FDI and clusters in Chapter 6, De Propris and Driffield question the sustainability of development paths where clusters are based on the attraction of FDI. This, they argue, often implies a monopsonistic governance structure where disproportionate power lies with the investing transnational. Indeed, they puruse a governance-based analysis in some detail, distinguishing between a number of different forms of cluster: local production systems, Porter's clusters, monopsonistic clusters, Marshallian industrial districts, and innovative *milieux*.
10. See, for example, Quintana and Pulignano's discussion of the case of Fiat in Chapter 9 of this volume.
11. See Branston et al. in the Appendix to this chapter for an explanation of the significance attached to health.
12. Useful references on these issues include Hickson et al. (1986) and Helle (1988).

# REFERENCES

Amin, A. and Robins, K. (1990), 'Industrial districts and regional development: limits and possibilities', in F. Pyke, G. Becattini and W. Sengenberger (eds), *Industrial Districts and Inter-firm Cooperation in Italy*, Geneva: International Institute for Labour Studies.

Becattini, G. (1978), 'The development of light industry in Tuscany: an interpretation', *Economic Notes*, **7**, 2–3.

Becattini, G. (1990), 'The Marshallian industrial district as a socio-economic notion', in F. Pyke, G. Becattini and W. Sengenberger (eds), *Industrial Districts and Inter-firm Cooperation in Italy*, Geneva: International Institute for Labour Studies.

Becattini, G. (1991), 'Italian industrial districts: problems and perspectives', *International Studies of Management and Organization*, **21** (1), 83–90.

Best, M.H. (1990), *The New Competition: Institutions for Industrial Restructuring*, Cambridge: Polity Press.

Boudeville, J.R. (1972), *Aménagement du Territoire et Polarization*, Paris: Genin.

Branston, J.R., Cowling, K. and Sugden, R. (2006), 'Corporate governance and the public interest', *International Review of Applied Economics*, forthcoming.

Brusco, S. (1990), 'The idea of the industrial district: its genesis', in F. Pyke, G. Becattini and W. Sengenberger (eds), *Industrial Districts and Inter-firm Cooperation in Italy*, Geneva: International Institute for Labour Studies.

Camagni, R.P. (1995), 'The concept of *innovative milieu* and its relevance for public policies in European lagging regions', *Papers in Regional Science*, **74**, 317–40.

Christerson, B. and Lever-Tracy, C. (1997), 'The third China? Emerging industrial districts in rural China', *International Journal of Urban & Regional Research*, **21** (4), 569–88.

Courlet, C. and Pecqueur, B. (1991), 'Local industrial systems and externalities: an essay in typology', *Entrepreneurship and Regional Development*, **3** (4), 3–4.

Cowling, K. and Sugden, R. (1998), 'The essence of the modern corporation: markets, strategic decision making and the theory of the firm', *The Manchester School*, **66** (1), 59–86.

Czamanski, S. and Augusto, L. (1979), 'Identification of industrial clusters and complexes: a comparison of methods and findings', *Urban Studies*, **16**, 61–80.

Dei Ottati, G. (1991), 'The economic bases of diffuse industrialization', *International Studies of Management and Organization*, **21** (1), 53–74.

Friedman, D. (1988), *The Misunderstood Miracle: Industrial Development and Political Change in Japan*, Ithaca and London: Cornell University Press.

Gordon, I.R. and McCann, P. (2000), 'Industrial clusters: complexes, agglomeration and/or social networks?', *Urban Studies*, **37** (3), 513–32.

Grabher, G. (1993), 'The weakness of strong ties: the lock-in of regional development in the Ruhr Area', in G. Grabher (ed.), *The Embedded Firm: On the Socio-economics of Industrial Networks*, London: Routledge.

Harrison, B. (1992), 'Industrial districts: old wine in new bottles?' *Regional Studies*, **26** (5), 469–83.

Harrison, B. (1994), *Lean and Mean: The Changing Landscape of Corporate Power in the Age of Flexibility*, New York: Basic Books.

Helle, F. (1988), *Decisions in Organizations: A Three-Country Comparative Study*, London: Sage.

Hickson, D.J., Butler, R.J., Cray, D., Mallory, G.R. and Wilson, D.C. (1986), *Top Decisions: Strategic Decision-making in Organizations*, Oxford: Basil Blackwell.

Jessop, B. (1998), 'The rise of governance and the risks of failure: the case of economic development', *International Social Science Journal*, **50** (155), 29–45.

Kooiman, J. and Van Vliet, M. (1993), 'Governance and public management', in K. A. Eliassen and J. Kooiman (eds), *Managing Public Organisations: Lessons from Contemporary European Experience*, 2nd edn, London: Sage.

Kotval, Z. and Mollin, J.M. (1998), 'The potential for planning an industrial cluster in Barre, Vermont: a case of hard-rock resistance in the granite industry', *Planning Practice & Research*, **13** (3), 311–18.

Krugman, P. (1991), 'Increasing returns and economic geography', *The Journal of Political Economy*, **99** (3), 483–99.

Lazerson, M.H. and Lorenzoni, G. (1999), 'The firms that feed industrial districts: a return to the Italian source', *Industrial and Corporate Change*, **8** (2), 235–66.

Markusen, A. (1996), 'Sticky places in slippery space: a typology of industrial districts', *Economic Geography*, **72** (3), 293–313.

Marshall, A. (1907), *Principles of Economics*, 5th edn, London: Macmillan.

Martin, R. (1999), 'The new "geographical turn" in economics: some critical reflections', *Cambridge Journal of Economics*, **23**, 65–91.

Martin, R. and Sunley, P. (2003), 'Deconstructing clusters: chaotic concept or policy panacea?', *Journal of Economic Geography*, **3**, 5–35.

Ohno, T. (1988), *Toyota Production System: Beyond Large-scale Production*, Cambridge, MA: Productivity Press.

Perroux, F. (1965), *Note sur la Notion de Pôle de Croissance, L'Economie du XX Siècle*, Paris: PUF.

Piore, M.J. and Sabel, C.F. (1984), *The Second Industrial Divide: Possibilities for Prosperity*, New York: Basic Books.

Pitelis, C.N. and Sugden, R. (1986), 'The separation of ownership and control in the theory of the firm', *International Journal of Industrial Organization*, **4** (1), 69–86.

Porter, M. (1990), *The Competitive Advantage of Nations*, New York: Free Press.

Porter, M. (1998), 'Clusters and the new economics of competition', *Harvard Business Review*, **76** (6), 77–91.

Powell, W.W. (1990), 'Neither market nor hierarchy: network forms of organization', *Organizational Behavior*, **12**, 295–336.

Putterman, Louis (1997), 'On the past and future of China's township and village-owned enterprises', *World Development*, **25** (10), 1639–55.
Saxenian, A.L. (1994), *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*, Cambridge, MA: Harvard University Press.
Scitovsky, T. (1954), 'Two concepts of external economies', *Journal of Political Economy*, **62** (2), 143–51.
Scott, A.J. (1988), 'Flexible production systems and regional development: the rise of new industrial spaces in North America and Western Europe', *International Journal of Urban and Regional Research*, **12**, 171–86.
Staber, U. (2001), 'The structure of networks in industrial districts', *International Journal of Urban and Regional Research*, **25** (3), 537–52.
Stoker, G. (1998), 'Governance as theory: five propositions', *International Social Science Journal*, **50** (155), 17–28.
Storper, M. (1997), *The Regional World: Territorial Development in a Global Economy*, London: Guilford Press.
Sugden, R. and Wilson, J.R. (2002), 'Economic development in the shadow of the consensus: a strategic decision-making approach', *Contributions to Political Economy*, **21**, 111–34.
Sugden, R. and Wilson, J.R. (2003), 'Urban and regional prosperity in a "globalised", "new" economy: an agenda and perspective', in R. Sugden, R. Hartung Cheng and R. Meadows (eds), *Urban and Regional Prosperity in a Globalised, New Economy*, Cheltenham: Edward Elgar.
Uzzi, B. (1997), 'Social structure and competition in inter-firm networks: the paradox of embeddedness', *Administrative Science Quarterly*, **42**, 35–67.
Whittaker, D.H. (1997), *Small Firms in the Japanese Economy*, Cambridge: Cambridge University Press.
Whittam, G. and Danson, M. (2001), 'Power and the spirit of clustering', *European Planning Studies*, **9** (8), 949–63.
Zeitlin, M. (1974), 'Corporate ownership and control: the large corporations and the capitalist class', *American Journal of Sociology*, **79** (5), 1073–119.

# APPENDIX: THE DEVELOPMENT OF LOCAL ECONOMIES AND THE POSSIBLE IMPACT OF PUBLIC POLICY: A FRAMEWORK FOR CASE STUDIES*

**J. Robert Branston, Lauretta Rubini, Silvia Sacchetti, Roger Sugden, Ping Wei and James R. Wilson**

## 1. Introduction

The aim of this contribution is to outline a framework for guiding case studies that analyse the development of local economies and the possible impacts of public policy, which includes not only government actions but also joint actions across private organisations/institutions. Our concern is with all local economies, whether in so-called 'developed', 'less developed' or 'developing' countries. The framework is thus purposefully general. For any individual case, its broad aims are:

- To highlight the determinants of the (lack of) development in a particular locality.
- To contribute to an understanding of the (in)significance of public policy in that (lack of) development.
- To emphasise the potential that lies in uncovering new capabilities as a result of learning in the development process.

The appropriateness of case studies as a research strategy is suggested by the nature of the issues being addressed. In particular, Yin (1994, p. 13) argues that the case-study method is appropriate when the goal is to cover contextual conditions and when 'the boundaries between phenomenon and context are not clearly evident'. In line with this, it is impossible, and indeed undesirable, to separate the phenomenon of 'development' from the context in which it occurs.[1]

Yin (1994) also notes the importance of theoretical analysis as part of the design phase of case studies. Indeed, depending on the theoretical perspective that is adopted, there are various methods that could be employed for analysing the development of economies. The approach presented here centres around special concern with the governance of the development process, and hence with the qualitative relationships between actors within and across localities. This focus stems from a particular theoretical perspective on the importance of strategic decisions (made in firms and other institutions) to the directions in which economies develop (Cowling

and Sugden, 1998, 1999). Combined with the argument that 'development' as a concept is only meaningful when it reflects the aims and objectives of those seeking to develop, a powerful theoretical argument can be made for the centrality of governance in understanding economic development and its impacts (Sugden and Wilson, 2002).

We proceed as follows. In the next section the context and imperative for our proposed framework are examined in some depth. Following from this, Section 3 proposes a set of key issues. These form the backbone of our methodological approach, which is detailed in Section 4. Section 5 concludes with brief comments on the application of the framework.

## 2. Theoretical Context and Imperative

Before suggesting a framework for analysing 'local development' we must make sense of that development. This implies that, after having conceptualised what we mean by development, we move from observations to a theory that investigates mechanisms that are intrinsic and extrinsic to localities, and which disposes those localities to be developing or not developing. Referring to the 'transcendental realism' philosophy of science (Lawson, 1997), the theoretical explanation through which we view localities reflects the existence of structures, mechanisms,[2] powers and tendencies.[3] While these are not always observable, they govern and facilitate specific events, in this case the inclusion of local communities in the determination of their own development objectives. In line with this approach we analyse specific events such as production governance, health and education as a manifestation of such deeper structures. Linked to mechanisms and tendencies we thereafter identify research issues that should be addressed in order to clarify aspects of the development/lack of development of localities.

The context for our approach is provided by an appreciation of the position in which the world finds itself 20 years on from the formation of the 'Washington Consensus'. First used by Williamson (1990), this term describes an approach to economic development based around fiscal discipline, financial liberalisation, trade and foreign investment liberalisation, privatisation, deregulation, and limited government intervention. While Williamson (1993, p. 1329) argues it to be 'the outcome of worldwide intellectual trends', others place its evolution on a narrower axis. Taylor (1997, p. 147), for example, describes it as an amalgamation of 'long-standing IMF macroeconomic stabilization policies, the World Bank's adoption of the market deregulation and supply-side economics ideas in vogue in Washington in the Reagan period, and London's zest for privatising public enterprises which crossed the Atlantic a few years later'. Regardless of the narrowness or otherwise of its conception, the extent of convergence on appropriate economic policy

that the Washington Consensus has engendered across the world has been remarkable; Rodrik (1996, p. 9) notes that 'faith in the desirability and efficacy of these policies unites the vast majority of professional economists in the developed world who are concerned with issues of development'.

Equally remarkable, however, is that throughout the world it is recognised that these policies have achieved limited results. For large numbers of people, in both 'developed' and 'less developed' economies, the consensus is associated with a continuing lack of 'competitiveness', and with exclusion from the wealth that the system undoubtedly generates for some. Moreover, exclusion extends beyond the attainment of wealth. Recent protests in Seattle, Genoa, and wherever the forces perceived to be at the core of the consensus meet, bear testimony to a diverse range of grievances.[4] Causes have ranged from concern with the environmental impact of corporations, through to their cultural effects, as well as encompassing the persistent poverty and growing inequality associated with current policies.

Exclusion can also be seen, for example, in the way in which people (do not) interact with large corporations. Such firms have significant impact on societies and on people's day-to-day lives, yet they are typically governed by exclusive interests (Cowling and Sugden, 1998, 1999; Branston et al., 2006). In making decisions concerning firms' activities, these interests determine firms' impacts. The result is strategic failure: concentration of strategic decision making power in the hands of a few implies a failure to govern activities in the interests of the community at large.

Dwindling support for this development agenda has recently been recognised to some degree by the institutions at the heart of the consensus. The World Bank and International Monetary Fund, for example, have responded with changes in emphasis and approach in their policy prescriptions. The change is partly reflected in a renewed focus on poverty, and on partnership in reducing poverty.[5] It is also partly reflected in a stronger emphasis on knowledge, learning and education (World Bank, 1998; Stiglitz, 1998b; Standing, 2000). A particularly key figure has been Joseph Stiglitz. Before his departure from the World Bank (in 1999), he talked forcibly of movement towards a 'post-Washington consensus', alongside other institutional reform (Stiglitz, 1998a, 1998b; Standing, 2000). However, his recent criticisms of practices within the Washington institutions (Stiglitz, 2002; Palast, 2002), and the circumstances of his departure,[6] highlight concerns that the institutions themselves are reluctant to fundamentally change their approach.[7]

While policy re-evaluation is clearly necessary, it is important first to reflect on why the Washington Consensus development agenda has failed to generate the necessary success and support. It has been suggested that its failure can be seen fundamentally in terms of a failure to engage people

in the decisions and processes surrounding their development (Sugden and Wilson, 2002, 2003). More specifically, the evolution of the Washington Consensus and encouragement of a certain sort of private sector economy have been associated with monopoly power and a denial of access to the 'global' economy for the vast majority of potential participants.[8] This denial not only implies an absence of provision, an absence of material welfare; it even implies a failure to include the majority in the determination of the aims and objectives of economic activity. This is an exclusion from determining the aims and objectives of development, the most fundamental of strategic decisions faced by an economy.

Although establishing macroeconomic stability and introducing new forms of governance may be argued to have gone some way to establishing the conditions under which increased access is possible,[9] it has also been suggested that purposive public policies are now needed to drive the process to a new stage. The world is in a position where the enterprise economy has been to some extent globalised through the activities of large corporations, but where community economies have remained fixed within localities. The challenge is to connect these localities within and across nations; to create an enterprise economy that appropriately includes all actors in all communities (Cowling and Sugden, 1999).[10]

There is an international system for integration involving the European Union, Mercosur and NAFTA, for example, but these organisations have essentially provided a focus for transnational corporations to increase their activities; it is this form of private enterprise that has come to dominate, leaving other forms unable to enter the game. The strength of these incumbents denies freedom and openness to the others that are unable to act. The incumbents are well placed to form regressive coalitions furthering their aims and thereby denying governance in the public interest (Bianchi and Miller, 1994).

The idea that uneven and exclusive access to the development process might be met by attempts to bring the governance of the development of localities closer to the people of those localities suggests to us a fundamental concern with learning and health. These factors are crucial if people are to become fully engaged in realising their own potential through participation in the development of their localities (Branston et al., 2005). In this sense the approach may appear similar to that of the World Bank, which has shown increasing concern with the roles of education and knowledge (World Bank, 1998; Stiglitz, 1998b). It differs fundamentally, however, in that the governance-centred emphasis on learning (and indeed health) concentrates on the ability of each individual to become involved in the decision making processes that shape the development path of their locality. The focus, therefore, is not confined to education and knowledge transfer as means

of enhancing the competitive advantage of localities. It extends further: to the learning that takes place when people, firms and institutions interact with each other, and that enables each actor to have an input into the governance of their locality. This concern with governance, and essentially with democracy, goes further than the World Bank has been willing or able to go thus far in its change of emphasis.[11]

It is also important to stress that concern in this theoretical perspective with large firms is especially from a qualitative rather than quantitative dimension. Current policy throughout the world typically sees inward investment by large corporations as good and sees the promotion of SMEs (small and medium-sized firms) as desirable. A difficulty, however, is that the large inward investors are often the drivers of the economic system, the organisations where strategic decisions over production are made. A vital issue is the potential for large firms that are part of a more inclusive, democratic strategic decision making process. Conversely, the SMEs currently encouraged by policy makers tend not to be drivers. Rather, in many circumstances, they are reactors, and often SMEs are strategically subject to large firms. In contrast, what are particularly interesting are situations where smaller firms, together in networks/clusters/agglomerations, and possibly alongside large firms as well, are not merely reactive, but are proactively participating in the shaping of production strategy, in the governance of a locality (Sacchetti and Sugden, 2003).[12]

Accordingly, the challenge is to consider the possibility of purposive public policy that would guarantee wider participation in the enterprise economy: this includes ensuring that all actors are aware of the importance of participating in the process, and themselves participate in the design and implementation of the opportunities. The suggestion is that this might be achieved by appropriate networking that entitles more actors to participate in strategic decisions and that ensures efficiency by opening localities to the forces of multinationalism. This networking would entail a variety of linkages – perhaps via trade, investment or information. It could be between firms, public policy agencies, governments, and indeed all organisations/institutions involved in a locality's production process. Furthermore, wider participation would require wider entitlement to and provision of learning and health processes. Each of these services is a central determinant of the quality of life in a given locality. They are crucial to the development of that locality and to connectivity in a global enterprise economy.

## 3. Key Issues

Drawing from the context and theoretical imperative explored in Section 2, Table 3A.1 proposes a series of key issues that appear crucial to analysing

the development of local economies. They are framed here in terms of research questions, the addressing of (some or all of) which would guide the undertaking of specific case studies. In particular, they are the interrelated and overlapping subjects on which information and data in the case studies need to be obtained and analysed, at least in the first instance.

*Table 3A.1 Key issues for case studies in industrial economic development and public policy*

---

*A. The economic background in a particular locality and, within this, particular industries and groupings of firms.* What are the principal economic characteristics of the locality? What are the mix and impact of firms of different sizes?

*B. The extent and provision of, and entitlement to, learning and health.* What is the availability of different types of education and health services? Are there effective means of communicating ideas across actors within these sectors?

*C. The actual and potential networks that span localities and industries.* Are actors in the locality involved in networks that impact on industrial economic development? What linkages exist across actors, localities and nations?

*D. Production governance within the locality.* Who governs and to what effect in each of the actors and networks in the economy?

*E. The extent and impact of public policies – at local, national and international levels – on the above.* What public initiatives are currently in force? Do they impact on the development process, and are there opportunities for improvement?

---

In addressing these research issues, two dimensions are especially relevant, namely 'space' and 'time'. As regards space, the focus is on particular localities in their national and international context, including in this links across localities. It is assumed that the definition of 'locality' is typically provided by the terms of reference of a specific case study, for example by the requirement to study a particular city or province defined by its geographical/administrative boundaries. In practice, this generally defines the unit of analysis in any particular case, although for a more detailed exploration of the concept of locality, see Sugden and Wilson (2003). As for the time dimension, it stems from a developmental and evolutionary perspective. This emphasises the significance of capturing the dynamic of

changes (or innovations). It is for this reason that it is important to analyse the key issues in terms of the past, present and the future.

## 4. Detailed Topics

In using this framework to analyse specific cases, information needs to be accessed and ordered according to the key issues. Details on the topics that might be considered under each of these issues are provided in the following subsections. It should be emphasised, however, that our intention is merely to provide clear and precise guidelines. It is not to be rigid. Rather, the collection and processing of information includes the need to reassess, to guard against errors and omissions through feedback. Topic A covers the contextual background of the case. Topics B to E pursue the issues we see as especially important within that context.

### A. The locality and its industries

A brief description of the locality to provide the background and context for the study, focusing on:

- The overall economic, social, political, geographical and cultural background, including a historical perspective and a comment on the infrastructure.
- The number of firms[13] in the locality, by size (number of employees, turnover), ownership type (for example, sole traders, partnerships, public limited company) and production sector. The identification of any especially prominent actors or groupings in the locality.
- Identification of the significant non-firm actors/influences in the locality. These include governmental institutions, non-governmental institutions, financial institutions, educational and health institutions, and international agencies. Also interesting is the possible presence of a broader range of associations, forums and activities where people meet in common function and/or where ideas are exchanged. Included in these are local trade associations and trade unions, service centres, science parks, media, youth/activity/community groups, sports clubs, religious gatherings/churches and other interest/pressure groups.[14]
- Aggregate indicators for the locality over recent years,[15] notably as regards employment and unemployment; output; value added; exports and imports; productivity; industry concentration ratios; innovation; investment; immigration and emigration; dependency ratios and demographics.
- Identification of the opportunities for and constraints on economic development in the locality, including where applicable the extent, composition and impact of the informal sector.[16]

**B. Learning and health**

The level and process of learning and health are the particular concerns, focusing on:

- The availability of education, including the numbers in school, and in further and higher education, as a proportion of their respective age groups; the duration of compulsory education; the extent of vocational training programmes; and financial and other constraints on access to education.
- Attainment levels in education, in their national and international context.
- The provision of training by firms and industry organisations, including its effectiveness, budgets by sector and firm size, and the provision of public support.
- The generation of new knowledge in firms and in other institutions, including investments in R&D (by sector and firm size), the amount of research funds directed to local educational institutions (in absolute terms and relative to amounts elsewhere), and the ability to take advantage of the knowledge generated.
- The existence of networks between actors within the locality for the purposes of learning and knowledge generation.
- The degree to which new knowledge is accessible by interested actors in the locality.
- Access to and use of communication media (including libraries and the Internet) for the different actors.
- The availability of health services, including the per capita number of doctors and of hospital beds, and the extent of preventive measures (including interaction with housing), financial and other constraints on access.
- Health levels of the population, in the national and international context.

**C. Linkages and networks**

Evidence of actual and potential networks involving firm and non-firm actors in the locality, focusing on:[17]

- Linkages (both formal and informal) between actors within and across sectors. These might include ties over trade – such as common marketing and purchasing, forward and backward industrial linkages or subcontracting relationships – as well as ties over investment, research and development, and joint activities in the pursuit of public support (for example, European Union funding).

- The membership and activities of significant non-firm actors, such as trade associations, as a gauge to the extent and characteristics of relationships across the economy.
- Linkages (both formal and informal) with economic actors in other localities, including in different nations.

**D. Production governance**

In certain respects this issue is the fulcrum of the case study, focusing on:[18]

- Ownership structures of firms operating in the locality, highlighting whether firms tend to be owned by individuals, families, governments, institutions, other firms, workers or cooperatives, and commenting on where those owners are based geographically.
- Evidence on the actors involved in making firms' strategic decisions,[19] on where those decision makers are based (within or outside the locality), how decisions are taken, and on whose interests are taken into account. Included in this, the influence of interest groups (local/national/international, and concerned with issues that affect the locality).
- Decision structures of learning and health institutions active in the locality. This includes evidence of how strategic decisions are taken, of who is involved in making the decisions, of where the decision makers are based geographically, how decisions are taken, and of whose interests are taken into account.[20]
- Decision structures of non-firm actors involved in production in the locality. This includes evidence of how strategic decisions are taken, of who is involved in making the decisions,[21] of where the decision makers are based geographically, how decisions are taken, and of whose interests are taken into account.
- Cooperation and conflict between actors in the locality in making strategic decisions, be it amongst themselves and/or with others. In part this is a focus on the governance of networks with which the locality is involved. Establishing, for example, if one or a few of its constituents dominate a network's strategic decision making process, or if there is broad participation. In part, the concern is whether actors integrate and coordinate their activities. For example, whether firms influence the strategic decisions in learning and health institutions to ensure that their needs are met, or if one sector (perhaps finance, for instance) is seen to constrain others inappropriately.
- The existence of mechanisms, processes and social norms that serve to self-regulate relationships within the production system, and their influence on governance.

- The significance of forums and channels for interested parties to represent their views on strategy to firms and other actors in the locality. These might include the use of media, discussion groups, planning enquiries, consultation exercises and regulatory agencies.
- The constraints and influences on strategic decisions that stem from forces external to the locality, for example from international agencies such as the World Trade Organisation, the World Bank, the International Monetary Fund, the United Nations and the European Union.

**E. Public policy**

A description focusing on:

- An outline of the apparently significant public policies (including laws, regulations, joint actions across private organisations/institutions) that are currently in force in the locality – whether these be local, national or international initiatives – and that are relevant to the key issues in the case study.
- The decision making processes for determining these public policies.
- The impact of those policies on the locality, including evidence on whether or not particular policies are actually implemented; on whether or not affected actors are aware that the policies exist and, if so, were involved in their formulation; and (where available) quantitative and qualitative data.

## 5. Conclusion: Application of the Framework

We have provided a theoretical context and imperative for a framework to guide case studies analysing local economic development. Five key issues have been identified, and within these we have highlighted detailed topics about which information is needed.

A 'full' case study on a particular locality might comprise a report structured into sections that address, in turn, each issue. It is also envisaged that 'partial' case studies will be undertaken. These would deliberately focus on a subset of the issues, but do so by positioning their insights in the context of the framework as a whole. For example, one option is to concentrate an entire case study on the especially prominent sectors of a locality. Perhaps related to this, another possibility might be to focus on a particular subject, for example to concentrate on actual/possible/alleged 'clusters' and their impact on the development of a locality; the objective would then be to consider the key issues and topics in the framework that

are relevant to analysis and understanding of the cluster. Another subject that might be relevant – to pick one of any number of instances – is the ways in which cooperation takes place among the economic actors in a locality. To study the influence of cooperation on the development of an economy, and the possible impact of public policy, the objective would be to consider the key issues and topics in the framework that relate to the study of cooperation.

Information on specific cases could be of two types: a collation of existing sources, and/or a collection of new information. In practice, however, it is likely that there will be inadequate or no existing information on some of these topics, indeed on some key issues. Given that the focus of this framework on governance and network relationships is a departure from more traditional approaches to analysing local economic development, there are likely to be significant areas where little can be deduced without collecting new information. None the less, whether cases pursue existing, new, or a combination of information sources, we provide a theoretically grounded set of concerns for the holistic study of the development of local economics and the possible impacts of public policy.

## Notes

* This contribution has benefited from discussions with colleagues across Europe regarding a research agenda and the possibility of networking projects; we would like to thank those colleagues, especially Marco Bellandi, Patrizio Bianchi, Keith Cowling, Jacques De Bandt, Nigel Driffield, Hans Schenk and Johan Willner. The responsibility for errors, however, is entirely our own.

1. For more detailed discussion of the appropriateness and limitations of case study research, see Yin (1994).
2. A mechanism, in Lawson's words, is 'a way of acting or working of a structured thing' (Lawson, 1997, p. 21).
3. Because events may be co-determined by a multiplicity of mechanisms that may not be explicitly manifest, we look at those mechanisms which cannot be actualised as 'tendencies'. 'Tendencies … are potentialities which may be exercised or in play without being straightforwardly realised or manifest in any particular outcome … A statement of a tendency … is not about long-run, "normal", usual, or average outcomes at the level of events … [it] is not a conditional statement about something actual or empirical but an *unconditional* statement about something non-actual and non-empirical … a statement of natural necessity without qualifications attached … It is … about a *power that is being exercised whatever events ensue*. It is, for example, about the gravitational field which acts on the pen in my hand and continues to do so irrespective of whether I toss the pen in the air, continue to write with it, or drop it in a vacuum' (Lawson, 1997, p. 23).
4. Protesters were prominent at the World Trade Organisation talks in Seattle in November 1999, the annual meetings of the IMF and World Bank in Prague in September 2000, the European Union summit in Gothenburg in June 2001 and the G8 summit in Genoa in July 2001, among other similar meetings.
5. At the centre of this are individual country 'Poverty Reduction Strategy Papers', which now form the basis for concessional lending to low-income countries by the IMF and World Bank. See www.worldbank.org/poverty/strategies/index.htm.

6. He resigned his post amid rumours that the US Treasury Secretary and former World Bank Chief Economist, Lawrence Summers, had lobbied for him to go. See 'Knives Out in Washington for a Free Spirit', *Financial Times*, 25 November 1999, and 'Steering a Way Through a Key Growth Debate', *Financial Times*, 26 June 2000.
7. In a detailed interview with Stiglitz, Palast (2002, p. 53) reports that 'what drove him to put his job on the line was the failure of the banks and the US Treasury to change course when confronted with the crises – failures and suffering perpetuated by their four-step monetarist mambo. Every time their free market solutions failed, the IMF simply demanded more free market policies.'
8. Ruigrok and Van Tulder (1995, p. 151), for example, suggest that 'what is often referred to as "globalisation" is perhaps better described as "Triadisation".' They argue that 'the 1980s internationalisation of trade and investments was largely limited to the United States, the European Community and Japan as well as East and South East Asia … other regions on the globe have been excluded from this supposedly "global" restructuring process'.
9. Rodrik (1996) notes that a distinction can be made between Washington Consensus policies aimed at macroeconomic stability, and those aimed at liberalisation and structural reform. He argues that 'consensus on what constitutes appropriate structural reform is based on much shakier theoretical and empirical grounds than is the consensus on the need for macroeconomic stability' (p. 11). He goes on to show that the successes of Taiwan and South Korea were generally achieved while following the Consensus in terms of macroeconomic stability, but diverging considerably from it terms of structural reform and liberalisation.
10. See also Sugden and Wilson (2003) for a distinction between 'elite' and 'democratic' forms of globalisation.
11. Indeed, Standing (2000) is critical of Stiglitz's proposals for a 'knowledge bank' with a role in bridging the 'knowledge gap' for the very reason that it 'offends principles of governance': 'The issue is governance. Who determines what is a knowledge gap? Who determines whose knowledge is to be taken into account? And who determines the chosen few to sit in judgement over the knowledge?' (p. 751).
12. Appropriate networking, wider entitlement to and provision of learning and health processes all imply the need to nurture the acquisition of social capital. See, for example, Woolcock (1998) and Cooke and Wills (1999).
13. Data at a local level might only be available by plant rather than firm. The larger the geographical area covered by a locality, other things equal, the more this might be a problem because plants are more likely to be under common ownership or control.
14. The broader range of associations, forums and activities is intended to capture the potential importance of meeting places, because it is through these that social interchange might increase the economic dynamism of a locality, or change its direction. The actors/influences are intended to reflect the relationship between the economic and social fabric of a locality. For a similar reason, the actors/influences are also included to reflect aspects of communication and empowerment, in particular feelings of inclusion in a locality's development.
15. The objective is to give a reasonable perspective over time, and to be consistent in so far as possible in all data presented in the case study.
16. This is included in particular because the informal sector in many 'less developed countries' may constitute the majority of the economy. For information on the informal sector, reliance might be needed on general descriptive literature for the locality.
17. Useful sources might be local governments, local chambers of commerce, reports and websites of local institutions, including associations of subcontractors.
18. Sources of information on firms include annual reports, registers of firms, national tax and other databases, and existing literature. For national and local governments, constitutional documents, websites and reports might be available. Similarly, websites and reports for other actors might be useful.
19. Essentially, to make strategic decisions is to plan the overall direction of production, to determine a firm's broad objectives and therefore govern the firm (see Zeitlin, 1974).

This includes the ability to determine in a broad sense a firm's geographical orientation, its relationships with other firms and with employees. For examples, see Branston et al. (2006).

20. This includes information on why specific players are involved, and how they came to be involved.
21. In the case of local government, for example, the type of voting system is relevant.

## References

Bianchi, P. and Miller, L. (1994), *Innovation, Collective Action and Endogenous Growth: An Essay on Institutions and Structural Change*, Milan: IDSE.

Branston, J.R., Cowling, K. and Sugden, R. (2006), 'Corporate governance and the public interest', *International Review of Applied Economics*, forthcoming.

Branston, J.R., Sugden, R. and Wilson, J.R. (2005), 'Healthy governance: economic policy and the health industry model', in M.R. Di Tommaso and S.O. Schweitzer (eds), *Promoting High-Tech Industries. Can Growth Lead the Way?*, Cheltenham: Edward Elgar, pp. 45–58.

Cooke, P. and Wills, D. (1999), 'Small firms, social capital and the enhancement of business performance through innovation programmes', *Small Business Economics*, **13**, 219–34.

Cowling, K. and Sugden, R. (1998), 'The essence of the modern corporation: markets, strategic decision making and the theory of the firm', *The Manchester School*, **66** (1), 59–86.

Cowling, K. and Sugden, R. (1999). 'The wealth of localities, regions and nations: developing multinational economies', *New Political Economy*, **4** (3), 361–78.

Lawson, T. (1997), *Economics and Reality*, London: Routledge.

Palast, G. (2002), *The Best Democracy Money Can Buy*, London: Pluto Press.

Rodrik, D. (1996), 'Understanding economic policy reform', *Journal of Economic Literature*, **34** (1), 9–41.

Ruigrok, W. and Van Tulder, R. (1995), *The Logic of International Restructuring*, London: Routledge.

Sacchetti, S. and Sugden, R. (2003), 'The governance of networks and economic power: the nature and impact of subcontracting relationships', *Journal of Economic Surveys*, **17** (5), 669–90.

Standing, G. (2000), 'Brave new words? A critique of Stiglitz's world bank rethink', *Development and Change*, **31** (4), 737–63.

Stiglitz, J.E. (1998a), 'More Instruments and Broader Goals: Moving Toward the Post-Washington Consensus', World Institute for Development Economics Research Annual Lecture, Helsinki.

Stiglitz, J.E. (1998b), 'Towards a New Paradigm for Development: Strategies, Policies and Processes', paper presented as the Prebisch Lecture, UNCTAD, Geneva.

Stiglitz, J.E (2002), *Globalization and its Discontents*, New York: Norton.

Sugden, R. and Wilson, J.R. (2002), 'Economic development in the shadow of the consensus: a strategic decision making approach', *Contributions to Political Economy*, **21**, 111–34.

Sugden, R. and Wilson, J.R. (2003), 'Urban and regional prosperity in a "globalised", "new" economy: an agenda and perspective', in R. Sugden, R. Hartung Cheng and R. Meadows (eds), *Urban and Regional Prosperity in a Globalised, New Economy*, Cheltenham: Edward Elgar.

Taylor, L. (1997), 'Editorial: The revival of the liberal creed – the IMF and the World Bank in a globalized economy', *World Development*, **25** (2), 145–52.
Williamson, J. (1990), 'What Washington means by policy reform', in J. Williamson (ed.), *Latin American Adjustment: How Much has Happened?*, Washington, DC: Institute for International Economics.
Williamson, J. (1993), 'The meaning of the Washington consensus', *World Development*, **21** (8), 1329–36.
Woolcock, M. (1998), 'Social capital and economic development: toward a theoretical synthesis and policy framework', *Theory and Society*, **27**, 151–208.
World Bank (1998), *World Development Report 1998/99*, Oxford: Oxford University Press.
Yin, R.K. (1994), *Case Study Research: Design and Methods*, 2nd edn, Thousand Oaks, CA: Sage.
Zeitlin, M. (1974), 'Corporate ownership and control: the large corporation and the capitalist class', *American Journal of Sociology*, **79** (5), 1073–119.

# 4. A perspective on clusters, localities, and specific public goods*

**Marco Bellandi**

## 1. INTRODUCTION

This chapter builds on previous research on industrial districts, local development paths and policies, clusters as 'local production systems', and specific public goods. All of these concepts are linked by more or less close relations, and progress must now be made along a couple of dimensions in the space of such relations. The first dimension concerns the nature and typology of public goods specific to clusters; the second dimension concerns the typology of paths of local development.

The empirical relation between public goods and local development led by clusters is well acknowledged within the relevant literature. The fact that this relation goes together with a rich array of different types of public goods, and with local governance (see Gilly and Perrat in Chapter 7 of this volume), is also well known. The chapter aims to illustrate, both in general terms and with various examples (more or less empirical), the idea that different types and mixes of public goods are related to differences in structural characters, evolutionary phases, and policy options of clusters and localities.

In Section 2 we recall some basic notions concerning clusters, local production systems and industrial districts. This brings us to the relevance of public goods that are, however, somewhat specific to the clusters' needs. In Section 3 we then elaborate on the concept of 'specific public good' and its definition. Sections 4 to 6 present some examples: these all focus on problems posed by high-tech and high-cultural activities, within or in comparison with the industrial clusters of classical districts. Finally, Sections 7 and 8 (the conclusion) try to extract some suggestions for policy and general interpretation.

## 2. INDUSTRIAL DISTRICTS AND CLUSTERS AS LOCAL PRODUCTION SYSTEMS

According to Porter (1998, pp. 197–8), clusters 'are geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions (for example, universities, standards agencies, and trade associations) in particular fields that compete but also cooperate'.

This type of definition could be considered a generalisation from the district context (Becattini, 1990; Brusco, 1990), for extensive application in localities different from industrial districts, and also on different territorial scales (Lazonick, 1993; Enright, 1998). In any case what would distinguish a cluster from a casual agglomeration of business activities, or from the territorial nodes of the internal–external organisation of an extended corporation, would be a mix of competition and cooperation in a field of connected productive activities. This corresponds actually to a very large set of phenomena.[1] They are important to consider but do not necessarily identify the presence of reproductive social conditions, such as those found in districts. A definition pointing more explicitly to reproductive conditions is proposed by Cooke (2002, p. 121). Clusters are 'geographically proximate firms in vertical and horizontal relationships involving localized enterprise support infrastructure with a shared developmental vision for business growth, based on competition and cooperation in a specific market field'.

We refer to this richer concept of cluster as the 'local production system' (LPS), a concept also pursued in detail in the context of FDI by De Propris and Driffield (Chapter 6). Systemic conditions refer here to multilateral effects linking the choices and actions of specialised producers, social entities and public authorities. They have a general influence on both the alignment of their incentives, and on the coordination of their contribution to the realisation and evolution of the local division of labour. A predefined and general set of markets does not manage adequately all these conditions. Local product and labour markets, and exchanges within and across teams of firms, presuppose the effective provision of well-adapted systemic conditions. The need for them corresponds to an implicit demand for goods with public characteristics (intra-team, inter-team, cluster-wide, district-wide, and also translocal).[2]

There exists a multiplicity of mechanisms of governance for such goods, from private joint action by teams of firms, consortia and business associations to public action, particularly when supported by some focused perception of the nature of the systemic conditions involved in the support of a cluster. Normally, in successful industrial districts, private joint action and

focused public action combine at various levels and degrees, producing a local governance of the public goods specific to the needs of the cluster and the district. Furthermore, this 'constructive work'[3] combines in various ways with the organic basis represented by customs and conventions, that is, informal institutions that grow easily from the accumulation of common experiences and experiments within a population of interconnected agents.

The results of a locally well-organised and evolving division of labour are economies (that is, competitive advantage) for local resources. The sources of these economies are partly external to the sphere of organisation of single producers, being dependent also on the producers' embeddedness in the cluster and the district.[4]

Reference to the industrial district also helps in the definition of what are the sources of cooperation and shared developmental vision within a set of specialised and partially competing producers. In the district (as a locality of industry), the stable and strong presence of a cluster has the meaning of embeddedness of specialised producers in a social process reproducing a cognitive and motivational nexus. More precisely, it is a 'cooperative nexus' that gives the subjective basis both for setting up a complex architecture of specific public goods, and for individual actions taking advantage of the resulting availability of systemic conditions. The specific goods with public characteristics represent the intermediate structure for the action of specialised independent producers, within or among teams, and on local markets.

A general definition of the concept of the 'specific public good' (SPG) is now proposed. The decision to spend some words and space on the issue is justified by the belief that this concept needs accurate comprehension in order to expand its use, in particular in cases of clusters outside districts (or outside the district model).

## 3. A DETOUR ON SPECIFIC PUBLIC GOODS

The public nature of a good is normally related to the presence of two characteristics: non-rivalry in consumption (i.e. consumption by one agent does not reduce the availability of the same good for another agent), and non-exclusion (i.e. non-enforceability of exclusive rights to access and consumption). In abstract terms the two characteristics may go together (pure public good) or be completely absent (pure private good). Two other extremes are defined by the mixes 'rivalry/non-exclusion' and 'exclusion/non-rivalry'. The first corresponds to goods in which the access of a new user is free, but tends to reduce the benefits for incumbent users. Particular, but important, cases are those characterised by (quasi-) zero marginal costs

up to the point of complete use of a limited carrying capacity. After that point, marginal costs increase quickly. These are quasi-public goods, in the sense that a level of demand inferior to the capacity reproduces the pure case. Territorial or environmental infrastructures, for example, often have this nature. The second mix corresponds to what is known as a pure club good.

Of course, in real situations the public characteristics of goods are observed in various and possibly changing degrees. Enforceability may be easy for one set of agents and difficult for others. It may depend on changing technological conditions, and in any case it always depends on legal institutions (formal or informal), themselves a set of fundamental public goods.

A third property to be considered is the differentiation of the costs and benefits of accessing goods with low 'rivalry', low 'exclusion', or both.[5] For example, in the case of a programme of vaccination, there are persons who benefit a great deal (those more easily and seriously attacked by a contagion) and others who benefit less. Or, pieces of productive knowledge, while showing non-rivalry in use, may suit the needs of particular sets of producers (Antonelli, 2000). The differences extend to the private costs of accessing the benefits. Here a useful distinction regards the private costs of funding the public good and the private costs brought about by other technological or organisational factors. The former take the form of taxes, tolls, fees and so on, while the latter depend on spatial, technical or organisational peculiarities of the sources supplying the public good. These peculiarities, possibly magnified by indivisibility in the production function of the public good, make easier the access to the good from certain places and for agents owning certain connecting qualities; from other places or with different connecting qualities the costs increase. This differentiation sometimes relates to specific factors, opening the way to the concept of 'specific public good'.

Let the acronym NBBF stand for 'net benefit before funding', that is, the (private) benefits after deducting the (private) costs of accessing, but before expenses for funding. Given a set $A$ of $n$ agents, defined by the presence of some general public authority (e.g. national state, a regional government, etc.), a public good is 'specific' to a subset $B$ of $m$ agents ($m < n$) if:

(i) $NBBF_i > X > 0$ only in $B$, with $X$ large enough that there exist distributive schemes acceptable by the agents in $B$, allowing the coverage of expenses for funding with the only contribution granted by the same agents;

(ii) for each agent $j$ included in the subset $C$ (complement of $B$ in $A$) is $NBBF_j < Y < X$, with $Y$ small enough that the individual net benefits

would be less than the individual contribution to funding if this were calculated on the basis of a distribution in equal parts (or other generic fiscal schemes) within the *A* set;

(iii) agents in *B* share a nexus of subjective tracts, possibly connected to common experiences and factual problems. This grants to the *B* group a source of common interest, to which the provision of the public good is instrumental (Oliver and Marwell, 1988). But it also has a knowledge content: that is, agents in *B* know their specific needs better than outside agents, and they tend to acknowledge reciprocally the existence of such specific needs (Ostrom, 1995).

The separation between the *B* and the *C* set has empirical significance if the ratio *m*/*n* is near neither 0 nor 1. The nexus defines a *B* group. A public good is *universal* (relative to *A*) if the separating numbers ($X$, $Y$) do not exist, while a public good is *generic* if the separating numbers exist, but the subset *B* is characterised by no specific nexus, consisting of individuals who have $NBBF_i > X$ only for random reasons.[6]

Let us consider this definition as the centre of a schematic model of provision of public goods generalising the district case. The basis is the existence of a community defined by a cultural, political, local or sectoral nexus. Specific public goods are related to such a nexus. Community members have significant net benefits from accessing them. The provision of specific public goods is also helped by the same nexus, both through the organic channels of customs and conventions and by consent and participation of the community, giving rise to local governance.

Many variations are implicit under the simplistic representation of the model. For example, within the set of specific public goods in a district, the relative importance of intra-team club goods, inter-team club goods, cluster and district public and quasi-public goods, and trans-local club and public goods, is variable. Within the mechanisms of provision, the relative importance and the combination of customs, conventions, private action, joint action, focused public action, and distant public action also vary.[7]

The idea of universal access as a right granted to the citizens of a nation extends also to goods and services showing low levels of direct public characteristics; for example, the provision of electrical and telephone services. Such services are seen as fundamental inputs within the production process of important immaterial public goods; for example, in the case of telephone services, the universal access to long-distance communicative capabilities within a community. They are the so-called public services.

The concept of 'local public services' is associated with the idea of an infrastructure that is a natural monopoly in the supply of services within a local system (a city, an industrial district, a rural system, etc.), and

whereby the services themselves have qualities justifying a public choice towards universal access. The inefficiency of a great (national or regional) public organisation may justify the organisation of a 'local universal' access by local public authorities, and the infrastructure is sometimes called a 'local public good'. The management of this infrastructure, of the local public services, and the regulation of access, funding, etc., may take different forms. With local public services the qualities of 'universality' and 'specificity' would appear as nested one in the other. However, some confusion is avoided if we accept a rough distinction between the local public service provided in a way that contributes specifically and positively to the needs of the local group, and other local public services supplied on a standardised or generic basis (Goglio, 1999). In the first case, the 'universal' access contributes to immaterial SPGs, and the management of local public services supply and provision is often, if not necessarily, the result of local governance.

## 4. SPECIFIC PUBLIC GOODS FOR THE DEVELOPMENT OF ICT IN INDUSTRIAL DISTRICTS

The concept of specific public goods and the model are now applied to clusters of different types, also outside pure district conditions. We will focus on examples of clusters integrating high-tech and high-cultural activities. Let us start from cases of adoption and development of information and communication technologies (ICT) in industrial districts.

The working of ICT needs the support of a variety of public goods (Hallgren and McAdams, 1996). Their object is knowledge, which is the non-rivalry good *par excellence*. Such general features have prompted discussions on the effects of ICT on the perspectives of industrial districts, and recent empirical investigations on the diffusion of ICT in Italian industrial districts give some interesting results (Micelli and Di Maria, 2000). In particular: (i) the diffusion of some ICT is widespread, for example the use of e-mail; and (ii) the diffusion of ICT related to the electronic management of production and logistics, or to digital markets, is very limited. A recent investigation focused on the Prato industrial district (near Florence, Italy), and in particular on its textile cluster, confirms these results, with some qualifications (Bellandi and Marullo, 2002). One is of particular interest here, that is (iii) investment in the use of electronic management is found in a few more structured leading companies, applying it to their own private networks.

It is quite easy to understand the difference underlying (i) and (ii). Some pieces of productive knowledge are used privately, representing the core of

the competitive advantage of a producer. Other pieces are public, even if they may be more or less easily transferable. Moreover, the communication of contextual knowledge depends on a shared specific nexus that gives meaning to information, while codified knowledge has a more generic or universal value. The use of e-mail does not change, in principle, the balance between private and public knowledge, or between contextual and codified knowledge. However, it easily lowers the costs of communicating public, codified knowledge, and it may complement the communication of contextual knowledge with a richer array of information. The set-up costs for accessing e-mail are low, and specific standards on the issues that are to be agreed on through e-mails come organically by means of repeated games and trials and errors, with low risk of heavy losses.

The use of electronic management and digital markets is different. The specific benefits are not so evident. For example, the textile district's producers rely traditionally on customisation, personal touch, and quick adaptation to market and technical windows of opportunity, while electronic management usually demands a pretty high degree of standardisation, at least in some aspects of the exchanges. Furthermore, making available, through digital channels, information on the presence of excess productive capacity, on the timing and stage of a job, on curricula of quality defects and so on significantly reduces the contractual power of independent producers against external customers. They rely on the combination of customisation and ambiguity in some aspects of the transaction. Finally, the set-up costs of access are high for many local producers when they have only a superficial 'digital' culture.

Digital platforms themselves are generally quite expensive, and their funding is not to be taken for granted. The role of (iii) is evident here. According to the investigation recalled above, the leading textile entrepreneurs in Prato have the resources for giving decisive support to collective action for new public platforms. They could advance in developing and testing adaptations of platforms specific to the character of a system where craft competencies and attitudes towards quick creative solutions are widespread. In this phase, the leading entrepreneurs seem more oriented to a private use of the new instruments. However, the transition to public platforms in cases of successful private platforms is not excluded.

The suggestions taken from this case are twofold. First of all, the set-up of new specific public goods may be facilitated by leading private agents within their own clubs or teams. But, second, the extension to cluster- or district-wide goods is not assured. The public or collective action is important here, not only that related directly to the industry,[8] but also that related to the social networks of the local society and not focused primarily on the productive cluster (Capecchi, 1996; Bramanti, 2001). Experiences of digital

exchanges in social networks can produce basic local public goods, which afterwards could turn out to be useful also within the industry, at least in terms of diffusion of the 'digital' culture (lowering set-up costs of access).

## 5. HIGH-TECH CLUSTERS

The local production system characterising an industrial district may integrate high-tech and high-cultural activities, but always has a fundamental manufacturing core. High-tech clusters are characterised instead by a core of R&D activities, where a set of interlinked technological and scientific knowledge is shared by the main actors through a common techno-scientific language. There is an active role for larger enterprises, for business services specialised in knowledge management, and for non-local research networks for the exchange of more or less codified knowledge. A central institutional role is played by universities and other centres of research, culture and higher education that safeguard the public sphere of accumulation and exchange of general scientific knowledge.[9]

However, contextual knowledge is a necessary factor in high-tech clusters too. They are specialised precisely in developing fields of business that are young both in terms of application of scientific and technological principles to production, and in terms of exploration of market opportunities. There are advantages in understanding, communication and exchange if production of scientific and technological knowledge takes place in the same area where some activities that use them are located, acting as open laboratories for testing, adapting, re-setting, finding new applications and so on.

A high-tech cluster, being not just a geographic concentration of high-tech companies, but a set of producers, scientists and so on, tied by a cooperative nexus, constitutes a propitious field for the progressive combination of high-tech codified knowledge and contextual know-how and creativity. The presence of such a nexus is suggested in case studies which refer to face-to-face contacts and shared bases of trust, helping to improve the capacity of monitoring and absorbing new technologies and scientific knowledge. The interaction between science-based organisations and various types of business companies is also observed, and possibly leads the latter to see technological and organisational innovation as a systemic and continuous activity, supporting the emergence of innovative start-ups and spin-offs (Keeble and Wilkinson, 1999). We recognise here processes similar to those of industrial districts.

A factor that seems to imply important differences, however, is the weight of external influences on the nexus. It is true that, even in the case of district producers, for whom the local nexus is particularly strong, there is some

subset of members (the traders, the final firms, the policy makers, etc.) directly involved also in trans-local networks of relations. Here they are interested in SPGs with larger territorial scale and with specific sectoral connotations (logistic systems, certification and security systems, digital markets, etc.). Furthermore, in time, SPGs supporting external economies within an industrial district may become universal public goods or less specific public goods. General markets and networks too need a complex web of supporting immaterial public goods, and if this web were purely universal, then external economies would disappear. The advantages of division of labour would be either absorbed in consumer surplus in the case of general competitive markets, or included as internal economies of dominant producers in monopolistic markets. It is a story implicitly told in any analysis of the regional life cycle.[10]

External influence is much more important in the case of high-tech clusters (Dupuy and Gilly, 1999). Investments in local relations are necessarily complemented by heavy investments in external relations, with their specific trans-local public goods: the university system, international networks of laboratories and conferences, virtual communities of scientists and experts, and so on. The reproduction of the nexus is more fragile, since both exit and entry are easier; for example, there is a wider role of large trans-local firms, with sets of standards, rules and general services provided internally and privately, rather than accessed as an SPG.[11] Within the set of SPGs, intra-team or inter-team club goods are also very important, given the need to protect heavy direct investment in R&D.

The high-tech model suggests the presence of a mix of specific public goods more tilted towards club goods and trans-local goods than in the case of clusters characterising classical districts. The needs behind this type of balance are obvious, as are the possible contradictions with a stable reproduction of systemic conditions at a cluster-wide and district-wide level. The local cooperative nexus is easily put under strain.

## 6. BIFURCATION IN THE DEVELOPMENT OF AN EVOLVING CITY

A last illustration concerns the evolution of a city – Florence – and its urban area, which is characterised by various types of clusters, but with a central role played by high-cultural activities (Lazzeretti, 2003). Some years ago, a research programme on the Florentine urban system identified the perspective of a bifurcation of the area in the near future.[12] Two considerably different types of feasible paths were envisaged, 'urban rationalisation' and 'redundant variety'.

(a) *Urban rationalisation* is a path bringing about the separation of the territory in which three main urban clusters operate. The principal cluster, tied to the concentration of art and monuments in the historical centre, would exclude, from the same centre, all activities but those most directly related to it, that is, tourist industries and cultural institutions. Housing of permanent residents, except the wealthy ones, would be altogether discouraged. The cluster tied to a tradition of mechanical engineering and health industries, and various activities supporting the tourist industry, would be located in the periphery of Florence and in the other municipalities composing the Florentine area. The cluster of fashion industries would tend to relocate towards the neighbouring industrial districts. This might appear as a gloomy prospect, even an unnatural and unfeasible one. However, the situation of Venice (Italy), with the central isles devoted to tourism, Murano to the old artisan glassworks, and Marghera to the chemical industry, is an example, if extreme, of such a model of separation.

(b) *Redundant variety* is a path of urban change consistent with the preservation of a large overlapping of the territorial, economic and cognitive spaces of the three clusters. A city and an urban system where tourism, culture and artisan activities, manufacturing and multimedia are located, at least in part, in the same or in neighbouring micro-areas, interact regularly, both materially and creatively. In this way the progressive role of the city for the neighbouring industrial districts of the central part of Tuscany would be affirmed. The result would be somewhat similar, at a very different scale, to a pattern of development identified for contemporary Los Angeles (Scott, 2000). This would appear as a "high" path of urban evolution, prolonging the current situation. However, increasing diseconomies of congestion, already a serious issue, could hamper the development of relations and kill activities that have a lower earning capacity in the short term.

It is quite clear that the support of one or the other path implies, in terms of local governance, choices towards different mixes of SPGs and models of provision. The 'rationalisation way' is much more oriented towards public goods specific to different sections of the city,[13] and to club goods,[14] combining with the action of private forces reacting to urban congestion.[15] The 'redundant variety way' demands a more challenging public and collective action, opposing the forces of urban congestion and rent (see previous note), and thus more balanced towards open public and quasi-public goods.[16] These are goods that support the interaction and the partial overlapping of the different cultural and economic activities of the city, its social cohesion, and a rich exchange with other localities, especially the nearby industrial districts of central Tuscany.[17]

# 7. LOCAL TECHNOLOGICAL POLICIES AND NEW TECHNOLOGICAL DISTRICTS

We have seen that differentiation in the demand for specific public goods from clusters and localities depends: (a) not only on differentiation in structural characters (Section 5); (b) not only on the peculiar needs of phases of transition to new structures (Section 4); (c) but also on policy options in the face of points of bifurcation in the evolutionary paths of clusters and localities (Section 6). We now try to gather these results around the issue and concept of a 'local and regional technological policy'.

Such a policy may be seen in different ways. In the 'technocratic' way investments in centres of technological excellence have the meaning of privileging new technocratic élites, 'the best and the brightest', increasing disparities and opportunism, breaking rules of social cohesion, with ensuing problems in terms of reproduction of the local processes of collective learning, trust and self-help (Bellandi, 2003). Social policies aimed at safeguarding civic participation, holding back the spread of new poverty and promoting access to global knowledge networks could be seen as a necessary complement to policies for the high-tech ascent, giving protection from the conflicts generated and not resolved within the productive and technological sphere. Finally, it would be very easy to consider the two sets of policies as the job of separate bodies of collective/public action.[18]

However 'political intervention on life in the out-factory sphere' (Brusco and Solinas 1997, pp. 41–9) is an ordinary component of action in dynamic industrial districts. Here it contributes to a virtuous circle of mobility and equity in local society, participation and involvement of workers on the job, resolution of conflicts within bilateral economic relations, and the constitution of (and access to) specific public goods. This circle is based also on the logic of the local production system, which demands the cooperation of many and diffused centres of knowledge, trust and self-help. The separation of the relations evolving within the productive space from the other social relations would seem to contradict the deep logic of development of clusters based on a cooperative nexus, at least as seen in industrial districts.

Furthermore, local and regional technological policies, conceived in economic and strategic terms, detached from a social background and wide cultural horizon, may be played out in a mercantilist mood, as a game against outer localities. Of course trans-local competition has necessary and positive sides, but the mercantilist attitude would instigate rent-seeking and political rents, give rigidities and inefficiencies to the constitution of trans-local public goods, and damage economic entrepreneurship. Perhaps, at a deep cultural level, there is even a contradiction with the reproduction

of local attitudes to trust in private and collective action; see, for example, Dupuy and Torre in this volume (Chapter 8) for an explicit discussion of trust relationships.

An escape from these contradictions is represented by policies trying to apply the district 'integrating' approach to 'new technological' conditions. Let us recall, in this vein, a conception proposed by Capecchi (1996) of 'new technological districts' as 'directed not at a mass public, or catering for demands of industry, but oriented towards promoting a better quality of life and environment' (p. 176).[19] Within such an approach, collective and public support towards the satisfaction of increasing basic needs in terms of health, culture, environmental safety and social security (Section 5) helps the development of new clusters around public goods and services. Local public services have a strong technical–scientific core, to which various types of manufacturing and services activities relate. Within the traditional mechanism of public provision of local public services (Section 3), this 'cluster' of different activities is hidden in the monolithic direction of public administration or the vertically integrated public firm. Within processes of reform, liberalisation, privatisation and the definition of new forms of public control and direction, the hidden clusters have the possibility to emerge, with an evolving combination of private, collective and public hands.[20] Public and private enterprises, high-tech competencies, personal care, and new artisan attitudes combine.

Social policy at local levels opens the way towards experimentation with new solutions and the detection of hidden social demand. Interconnected localities can be open laboratories for the action of corporations, small firms, public agencies and non-governmental social agencies, with cultural policy helping the transmission and comparison of experiences among localities (Sugden and Wilson, 2003). Technological policy helps combine the private incentive to innovate with the public sphere of knowledge. Industrial, regulation and competition policies support the combination of new competencies with old industrial and artisan traditions, monitor the management of privatised public services, and safeguard the space of small firms against predatory strategies. Small high-tech firms and neo-artisan firms have a strategic role, given their ability to adapt to idiosyncratic needs and to get involved in local networks of social relations.

## 8. CONCLUSIONS

Let us summarise the main qualifications resulting from the framework and the examples discussed in this chapter.

First, in general conceptual terms, the framework above involves not 'local' public goods, generically, but public goods that are 'specific' to the needs of the cluster and the locality (SPG). They may be defined at various territorial levels, even if the local level is fundamental.

Second, the need for SPGs comes from the support demanded by the realisation of the competitive advantage of a relatively decentralised system of production, for example, is a cluster falling within the rich definition of the concept adopted here (local system of production). In more theoretical terms, the relation above concerns specific public goods and the realisation of economies partially external to the sphere of organisation of single producers, but internal to the cluster and locality in which they are possibly embedded.

Third, SPGs are differentiated not only in terms of functions and territorial span, but also in terms of the type and degree of public characteristics that they show (pure public good, quasi-public good, club good). This is true of course for universal and generic public goods, too. However, what we mean here is precisely that a cluster (and local development through clusters) needs a well-balanced set of specific public goods with different degrees and types of public characteristics. So, for example, a balance too much tilted towards club goods (that is public goods with restrained or privatised access) would spoil the openness and mobility of economic and social resources within the cluster and the locality; while a mix too poor in club goods would mean that teams of producers within the cluster are not strong enough against local markets and traditions, and this would impair the innovative capacities of the cluster itself.

Fourth, the balance of SPGs changes over time and with the nature of clusters and localities themselves. For example, high-tech clusters, compared to traditional district clusters, demand in a higher degree both a particular type of open local SPG (the open local arena for circulating new ideas) and various club goods with a trans-local scope (as those supporting networks of scientists). This and other cases have been discussed in the sections above.

Finally, the definition and constitution of SPGs are tied genetically to the nature of the social relations connecting the producers and to their consent for provision and access. This is also the reason why policies 'integrating' various types of SPGs, both in the productive and in the social (often, local) spheres, may be more consistent with the cluster as a local production system than separate and separating policies. The effects of production relations extend over out-of-the-factory life, which forms a laboratory for new cluster relations.

# NOTES

* This chapter may be considered as a follow-up of Bellandi (2003). Previous versions have been presented in three conferences: EUNIP, 6th Annual Conference, Turku (Finland), 5–7 December 2002; Workshop on Urban and Regional Prosperity in a Globalised Economy, Rovira i Virgili University, Reus (Spain), 6–8 March 2003; EUNIP, 7th Annual Conference, Porto (Portugal), 18–20 September 2003. I would like to thank the organisational committees, the audiences, and James Wilson. A larger version of the paper is published in Spanish in *Ekonomiaz, Basque Economics Journal.*

1. This is a point implicitly recognised by Sugden el al. in Chapter 3 of this volume. Their argument is that analysis of the impacts of such a potentially wide phenomenon as clusters should take into account distinctions based on fundamental economic characteristics, where their chosen focus is governance. See also the chapters by Di Tommaso et al. (Chapter 13), Henry and Pinch (Chapter 5), Parrilli (Chapter 10), and Pitelis and Pseiridis (Chapter 2) for further discussion in this volume around definitions of clusters and industrial districts.
2. For example, within teams of firms these might be intangible goods (such as patented or private knowledge on innovative products and processes, private access to common financial or market channels, or quality certification), or tangible goods (such as instruments with high indivisible capacity, specifically adapted to production and product development within the team). At the level of the cluster or locality they might be, for example, rules for defining prices and contracts on local markets, technical standards and jargon, rules on permitted imitation and bankruptcy, focused vocational and professional schools, or centres for real services. The last are necessary for the support both of industrial relations within the cluster, and of consistent relations between the cluster activities and the social and civic life of the district. See, for example, Quintana and Pulignano in Chapter 9 of this volume specifically on industrial relations, the authors previously mentioned in the text, and also Goglio (1999), Nadvi and Schmitz (1999) and Raines (2002).
3. According to a Marshallian (1927) expression.
4. No need to recall here the classical introduction, by Alfred Marshall, of the distinction between internal and external economies applied to the assessment of the efficiency of different forms of industrial organisation (Becattini et al. 2003). Embeddedness (Granovetter, 1985) is used here to mean: (a) that individual resources are adapted to the needs of integration, both for accessing other resources and to be accessed; (b) that the adaptation is the result of investments of time and energies sunk into the system; and (c) that the investments come also as a joint effect of sharing common experiences and experiments of life and work.
5. Starrett (1988, p. 58) sees this third property not *per se*, but as the result of the weakening of public properties brought about by a particular type of rivalry.
6. Examples that usefully illustrate the concept of the specific public good can be found in Coase (1974), Beito (1993), and of course in the literature on local public goods and collective goods. See Stiglitz (1977), Starrett (1998) and Olson (1971).
7. Compare Gilly and Perrat's distinction between three main local governance structures in Chapter 7 of this volume.
8. In June 2003, the local Business Association (UIP) and the Chamber of Commerce presented a programme for the electronic exchange of information and orders between various types of specialised producers in the Prato district. The UIP director has declared that this programme 'was promoted by a few industrial firms viz. larger firms but it is now extended to the participation of smaller firms and textile artisans'. Cited in *La Spola*, 5 July 2003, p. 21.
9. See Cooke (2002). Technical and codified knowledge is also necessary in district clusters for reducing manufacturing costs and reproducing stable access to a large set of external markets. This need is increased in periods of technological revolution, with the application of new powerful technologies (such as ICT and bio-technologies) in many

fields of economic and social activity. See also Henry and Pinch's model for analysing knowledge diffusion in clusters (Chapter 5 of this volume), and Di Tommaso et al.'s detailed discussion of the specific characteristics of high-tech clusters (Chapter 13).

10. This means that some 'local' external economies become, first, 'mobile' external economies (Robinson, 1958), and then disappear as such. At the same time, in lively industrial districts, new external economies regenerate.
11. Within a high-tech cluster, or within an industrial cluster where high-tech and high-cultural activities are integrated, the presence of international companies plays an important connecting role. But we cannot ignore that they are also centres of market power. Trans-local (national) companies may adopt various strategies with respect to clusters and localities. Policies towards local strategies of trans-local companies are disparate, ranging from passive territorial marketing to active targeting and monitoring. Active targeting implies also the support of a local technological and scientific capacity not strictly dependent on the (Greek) gifts of trans-local companies (Bianchi, 1996; Belussi, 1999; Longhi, 1999).
12. Though no dramatic external shock was expected. We draw here on some reflections and passages included in Bellandi (2000). See also Aranguren et al. in this volume (Chapter 12) for discussion of a related scenario thought to be facing the province of Gipuzkoa in the Basque region of Spain.
13. That would be the case if municipal sanitary rules choking the possibility of craft-manufacturing activities in the centre were pursued. The necessity of public health could be magnified, but the true aim would be an enlarged space for the tourist industry.
14. It is possible to imagine a quasi-privatisation of the streets, with the highest commercial and tourist value increasing the apparent security of rich tourists and customers by means of barriers, security guards, television cameras, if not fees for access.
15. Urban rents tend to exclude from the rich centre housing for working-class people.
16. A modern interpretation of craft jobs, complementary and/or substitutes to the old ones, could grow if a strong relation with the preservation and use of the historical endowment were maintained, and if support in new technologies (IT, new material, etc.) were found. For example, relations between the traditional artisan activities devoted to restoration and reproduction of ancient furniture, and the small but dynamic software houses already operating in Florence, could develop new processes (say, CAD or CAD–CAM software), helping the expansion of the business of craft companies. A systematic growth of such relations would demand the support of various types of cluster-wide and area-wide public goods.
17. A committee composed of various local constituencies has been gathered recently by the Florentine municipality, with the aim of defining a 'strategic plan' for the city and its area. The plan has been defined by the committee, and is now adopted, at least formally, by the current local administration. This plan points to a set of actions largely consistent with what has been called in this section the 'redundant variety path'. Just to recall the main action axes: (a) fostering innovation through a better integration of resources and functions; (b) equilibrating the localisation of functions between Florence and its larger urban area; (c) effectively organising the internal mobility and access; (d) improving the urban quality as a resource for the development. See Aa.Vv. (2001), and http://www.comune.firenze.it/progettarefirenze, accessed 15 April 2003.
18. It is also consistent with a common distribution of tasks in public authorities between departments of productive activities and economic development, and departments of social affairs and labour, or the like. Of course, according to some extreme pro-market views, even public support to social welfare should be dismantled.
19. This orientation 'implies not only a market logic but also the taking into account of the needs of people and end users who have the greatest disadvantages and difficulties and who not only may have less resources but actually less possibility of access to them. Thus the aim of an NTD is not merely the provision of goods and services for categories of consumers but also the making of investments in personal skills, linking technological with social innovation' (Capecchi, 1996, p. 189).

20. The transition brings about difficulties and increasing inefficiency and inequality. However, a well-governed process may also support the final adaptation to a higher level of efficiency, the preservation of public aspects, the development of new division of labour at the local level and its connection with more traditional productive clusters. See, for example, Bellandi and Petretto (2002), Branston et al. (2005) and Schweitzer and Di Tommaso (2003).

# REFERENCES

Aa.Vv. (2001), 'Progettare Firenze. Materiali per il Piano Strategico dell'area metropolitana fiorentina: quadro di sintesi delle tendenze di sviluppo e proposte', *Sviluppo Locale*, **18**, 118–53.

Antonelli, C. (2000), 'Collective knowledge communication and innovation: the evidence of technological districts', *Regional Studies*, **6**, 535–47.

Becattini, G. (1990), 'The Marshallian industrial district as a socio-economic notion', in F. Pyke, G. Becattini, W. Sengenberger (eds), *Industrial Districts and Inter-firm Co-operation in Italy*, Geneva: International Institute for Labour Studies.

Becattini, G., Bellandi, M. Dei Ottati, G. and Sforzi, F. (2003), *From Industrial Districts to Local Development. An Itinerary of Research*, Cheltenham: Edward Elgar.

Beito, D.T. (1993), 'From privies to boulevards: The private supply of infrastructure in the United States during the nineteenth century', in J. Jenkins and D.E. Sisk (eds), *Development by Consent. The Voluntary Supply of Public Goods and Services*, San Francisco: Institute for Contemporary Studies Press.

Bellandi, M. (2000), 'Paths of an evolving city: alternatives and relevance in local policy', *European Planning Studies*, **6**, 799–808.

Bellandi, M. (2003), 'Industrial clusters and districts in the new economy: some perspectives and cases', in R. Sugden, R. Hartung Cheng and R. Meadows (eds), *Urban and Regional Prosperity in a Globalized, New Economy*, Cheltenham: Edward Elgar.

Bellandi, M. and Marullo, C. (2002), 'Il rapporto controverso fra ICT e tessile pratese: evidenze e spunti di riflessione', *Economia e politica industriale*, **113**, 209–22.

Bellandi, M. and Petretto, A. (2002), 'Beni e servizi pubblici in Italia: fra riforme e possibilità di sviluppo', *L'Industria*, **4**, 695–717.

Belussi, F. (1999), 'Policies for the development of knowledge-intensive local production systems', *Cambridge Journal of Economics*, **23**, 729–47.

Bianchi, P. (1996), 'New approaches to industrial policies at the local level', in F. Cossentino, F. Pyke and W. Sengenberger (eds), *Local and Regional Response to Global Pressure: The Case of Italy and its Industrial Districts*, Geneva: International Institute for Labour Studies.

Bramanti, A. (2001), 'Nuove tecnologie di comunicazione e cambiamento locale', in G. Becattini, M. Bellandi, G. Dei Ottati and F. Sforzi (eds), *Il Caleidoscopio dello Sviluppo Locale. Trasformazioni Economiche nell'Italia Contemporanea*, Torino: Rosenberg & Sellier.

Branston, J.R., Sugden, R. and Wilson, J.R. (2005), 'Healthy governance: economic policy and the health industry model', in M.R. Di Tommaso and S.O. Schweitzer (eds), *Promoting High-Tech Industries. Can Growth Lead the Way?*, Cheltenham: Edward Elgar, forthcoming.

Brusco, S. (1990), 'The idea of the industrial district: its genesis', in F. Pyke, G. Becattini and W. Sengenberger (eds), *Industrial Districts and Inter-firm Co-operation in Italy*, Geneva: International Institute for Labour Studies.

Brusco, S. and Solinas, G. (1997), *Competitività e Partecipazione. Una Proposta di Politica del Lavoro*, Bologna: Il Mulino.

Capecchi, V. (1996), 'New technological districts for promoting the quality of life and the environment', in F. Cossentino, F. Pyke and W. Sengenberger (eds), *Local and Regional Response to Global Pressure: The Case of Italy and its Industrial Districts*, Geneva: International Institute for Labour Studies.

Coase, R.H. (1974), 'The Lighthouse in Economics', *The Journal of Law and Economics*, **17** (2), 357–76.

Cooke, P. (2002), *Knowledge Economies. Clusters, Learning and Cooperative Advantage*, London: Routledge.

Dupuy, C. and Gilly, J.-P. (1999), 'Industrial groups and territories: the case of Matra-Marconi-Space in Toulouse', *Cambridge Journal of Economics*, **23**, 207–23.

Enright, M.J. (1998), 'Regional clusters and firm strategy', in D. Chandler, P. Hagström, and Ö. Sölvel (eds), *The Dynamic Firm. The Role of Technology, Strategy, Organization, and Regions*, Oxford: Oxford University Press.

Goglio, S. (1999), 'Local public goods: Productive and redistributive aspects', *Economic Analysis*, **1**, 5–21.

Granovetter, M. (1985), 'Economic action and social structure: the problem of embeddedness', *American Journal of Sociology*, **91**, 481–510.

Hallgren, M.M. and McAdams, A. (1996), 'The economic efficiency of internet public goods', in L. McKnight and J. Bailey, *Internet Economics*, Cambridge, MA: MIT Press.

Keeble, D. and Wilkinson, F. (1999), 'Collective learning and knowledge development in the evolution of regional clusters of high technology SMEs in Europe', *Regional Studies*, **33**, 295–303.

Lazonick, W. (1993), 'Industry clusters versus global webs: Organizational capabilities in the American economy', *Industrial and Corporate Change*, **2** (1), 1–24.

Lazzeretti, L. (2003), 'City of art as a HC local system and cultural districtualisation processes. The cluster of art-restoration in Florence', *International Journal of Urban and Regional Research*, **3**, 635–48.

Longhi, C. (1999), 'Dallo sviluppo locale esogeno a quello endogeno: i casi di Tolosa e del polo tecnologico di Sophia Antipolis', in A. Quadrio Curzio and M. Fortis (eds) (2002), *Complessità e Distretti Industriali. Dinamiche, Modelli, Casi Reali*, Bologna: Il Mulino.

Marshall, A. (1927), *Industry and Trade* (reprint of 3rd edn 1920, 1st edn 1919), London: Macmillan.

Micelli, S. and Di Maria, E. (eds) (2000), *Distretti Industriali e Tecnologie di Rete: Progettare la Convergenza*, Milano: Franco Angeli.

Nadvi, K. and Schmitz, H. (eds) (1999), *World Development, Special Issue on Industrial Clusters in Developing Countries*, **9**.

Oliver, P.E. and Marwell, G. (1988), 'The paradox of group size in collective action. A theory of the critical mass. II', *American Sociological Review*, **53** (February), 1–8.

Olson, M. (1971), *The Logic of Collective Action. Public Goods and the Theory of Group*, Cambridge, MA: Harvard University Press.

Ostrom, E. (1995), 'Self-organization and social capital', *Industrial and Corporate Change*, **4** (1), 131–59.

Porter, M. (1998), *On Competition*, Boston: Harvard Business School Press.
Raines, P. (2002), *Cluster Development and Policy*, Aldershot: Ashgate.
Robinson, E.A.G. (1958), *The Structure of Competitive Industry*, Cambridge: Cambridge University Press.
Schweitzer, S.O. and Di Tommaso, M. (2003), 'Why do biotechnology firms cluster? Some possible explanations', in R. Sugden, R. Hartung Cheng and R. Meadows (eds), *Urban and Regional Prosperity in a Globalized, New Economy*, Cheltenham: Edward Elgar.
Scott, J. (2000), *The Cultural Economy of Cities*, London: Sage.
Starrett, D.A. (1998), *Foundations of Public Economics*, Cambridge: Cambridge Economic Handbooks.
Stiglitz, J.E. (1977), 'The theory of local public goods', in M.S. Feldstein and R.P. Inman (eds), *The Economics of Public Services*, Basingstoke: Macmillan.
Sugden, R. and Wilson, J.R. (2003), 'Economic prosperity and globalisation: An agenda and perspective', in R. Sugden, R. Hartung Cheng and R. Meadows (eds), *Urban and Regional Prosperity in a Globalized, New Economy*, Cheltenham: Edward Elgar.

# 5. Knowledge and clusters

**Nick Henry and Steven Pinch**

## INTRODUCTION

In the last two decades the analysis of geographically clustered firms has tended to shift away from a focus on overt, traded, exchanges of commodities and services towards the study of predominantly untraded exchanges of knowledge and ideas (see, for example, Storper, 1995; Maskell, 2001; Cooke, 2002; Gertler, 2003; Amin and Cohendet, 2004). Behind this shift of emphasis lies a growing recognition that the advantages conferred on firms by clustering together stem not only from agglomeration economies or the minimisation of transaction costs (Gordon and McCann, 2000; Pinch and Henry, 1999b). Equally, if not more important, are the competitive advantages secured by firms through gaining rapid access to knowledge concerning the innovations, techniques and strategies of competitor firms. However, this shift of emphasis has resulted in substantial conceptual and empirical problems. To begin with, at the conceptual level, a category such as 'knowledge' is immensely complex (Bryson et al., 2000). For example, evidence suggests that it is not so much individual items of knowledge that are crucial to competitive advantage as the capacity of firms to absorb and learn from the practices of other firms. In addition, at the empirical level, since many of these processes of knowledge exchange are opaque or hidden, there are major challenges in validating their significance.

In this chapter, through the adoption of a knowledge-based view of clusters and economic performance, we attempt to tackle both of these issues. First, at the conceptual level, we develop a model of knowledge dissemination. Our discussion seeks to extend a provisional formulation that we have outlined elsewhere (Pinch et al., 2003; Tallman et al., 2004). This model suggests how the nature of knowledge affects both the direction and the speed at which knowledge is spread among competing firms. In particular, we argue that asymmetries in knowledge flows can lead to competitive advantage for both individual firms and for firms located in clusters. In this chapter we now extend this model to postulate asymmetries in knowledge spread originating at the national level. Second, at the empirical level, we discuss some of the

problems involved in validating the importance of knowledge flows and illustrate briefly some of the key processes of knowledge flow leading to competitive advantage for both individual firms and clusters. We conclude with some comments that seek to both put knowledge and clusters 'in their place' within the theoretical and empirical terrain of economic geography, and emphasise how a knowledge-based formulation of clusters aids further analysis of industrial development.

## THE PROBLEM WITH CLUSTERS

We should note at this juncture that a lively debate still continues about the 'added value' of the concept of clusters (see, for example, Markusen, 1999; Martin and Sunley, 2003; Benneworth et al., 2003; Benneworth and Henry, 2004) and their current constitution as the spatial manifestation of a knowledge-based or learning economy (Maskell and Malmberg, 1999; Maskell, 2001; Cooke, 2002). There are a number of lines of argument. To begin with, it is argued that the emphasis given to knowledge spillovers is based on an idealised view derived from a very limited range of high-technology industries, such as those in the field of electronics (Saxenian, 1994) or motor sport (Henry and Pinch, 2000). Such examples stress the importance of groups of SMEs engaged in the mutual exchange of various types of information through both formal and informal means. However, critics argue that different types of process may be applicable in different industrial structures. Consequently, even where clusters exist, knowledge spillovers may not be the most convincing explanation for industrial competitiveness. For example, Simmie and Sennett (1999) argue that the most important factors leading to high rates of innovation among firms in London are broad agglomeration economies, especially access to premises and skilled labour, with access to knowledge or local suppliers being of secondary importance. In a similar vein, Gordon and McCann (2000) argue that a pure agglomeration model is more relevant than some form of social learning approach for explaining the existence of clusters in London. Nevertheless, most recently, Keeble and Nachum (2002) have explained clustering processes within London's business services through the incorporation of a range of explanatory factors, including those derived from knowledge spillovers.

A second line of argument is that clustering is not essential for innovation and that its merits have been overstated. The reason for this is that the interpretation of knowledge is often reliant upon a 'community of practice' that may be dispersed over great distances (Amin and Cohendet, 1999, 2004). In the case of the pharmaceuticals industry, for example, the regulation of

new drugs is dependent upon a wider scientific community and international regulatory bodies rather than a local interpretative community (Simmie and Hart, 1999).

In part, such criticisms may be seen as a reaction to the hype and exaggeration that has surrounded the 'cluster thesis', or more correctly the numerous cluster theses, that have emerged in recent years. Indeed, clustering seems to be widely regarded by many national governments and local and regional development agencies as some universal panacea for encouraging economic competitiveness (Lovering, 1999; Martin and Sunley, 2003).[1] We should note in this context that a focus on endogenously generated regional growth rather than notions of exogenous growth determined by inward 'top–down' investment also accords with contemporary neoliberal agendas. Nevertheless, the 'learning economy' thesis has offered a new role for regional development agencies working in partnership with the private sector to foster 'institutional thickness' (Amin and Thrift, 1992; Cooke and Morgan, 1998) – the idea that local institutions can help foster the spread of capacities to assist learning by clustered firms. It is therefore important to acknowledge that the debate has been 'hijacked' somewhat by those promulgating a few success stories, most notably of course Silicon Valley. Thus, other arrangements may also be, and are, conducive to economic competitiveness. Nevertheless, we should also note that under certain circumstances clustering can – for whatever reasons – produce remarkably successful outcomes. It is therefore hardly surprising that fostering such clusters has taken on the role of the search for the Holy Grail in some development circles. The fact that clustering has been exaggerated is therefore no reason to ignore this important phenomenon.

The charge of conceptual confusion levelled at 'clusters' is also unsurprising. There is still something enigmatic and elusive about what constitutes a successful recipe for clustering and, consequently, there has been a plethora of ideas and conceptual frameworks forwarded to account for this (Martin and Sunley, 2003; Newlands, 2003; Benneworth and Henry, 2004).[2] The rigour of some of the empirical analysis of clusters to date may be questionable but, as will be shown below, some of the complex processes defy simple labels. A diversity of approaches is one of the inevitable by-products of studies that are still in their relative infancy. Indeed, for Benneworth and Henry (2004), 'clusters' should be recognised as an emergent set of multiple perspectives in dialogue. Moreover, from an epistemological position of hermeneutic theorising (Barnes, 2001), 'clusters' has the potential to add value by allowing theoretical debate across a wide range of (overlapping and competing) perspectives whose partiality and situatedness are made explicit precisely through such close debate.[3]

## DEFINITIONS

An almost bewildering diversity of terms is currently used to describe industrial agglomeration, including 'districts' (Marshall, 1919; Becattini, 1990), 'clusters' (Porter, 1998), 'new industrial spaces' (Scott, 1988), 'neo-Marshallian nodes' (Amin and Thrift, 1992), 'learning regions' (Florida, 1995), 'associational economies' (Cooke and Morgan, 1998), 'milieu' (Campagni, 1991), 'innovative milieu' (Maillat, 1995) and 'nexus of untraded interdependencies' (Storper, 1995). These definitions range from quite restricted ones, such as 'industrial districts', referring to geographically restricted groupings of firms in the same sector (see Amin, 2000), to much wider definitions of 'clusters' which can relate to geographically extensive areas throughout nations and even beyond their borders (Porter, 1998). These neologisms reflect differing interpretations of the key processes at work which lead to agglomeration, although we should note that some of the differences are rather subtle and most are extensions or a reworking of basic Marshallian ideas. Given this plethora of concepts, some clarification of the terminology used in this chapter is appropriate at the outset. We argue that there are limitations in each of the extremes outlined above; narrowly defined industrial districts can ignore the diversity of industrial agglomerations whilst broadly defined clusters can lose conceptual precision, especially when they incorporate politically driven policy agendas. We therefore steer a path between these extremes and use the terms 'cluster' and 'agglomeration' interchangeably to refer to geographical groupings of firms (both large and small but often SMEs), broadly in the same sector, but extending beyond to incorporate greater parts of the value chain. Such groupings will combine, and be facilitated by, both traded and untraded geographically constituted economic processes. Such a definition includes most of the well-known examples of economic agglomeration such as 'Silicon Valley' (Saxenien, 1994), Baden-Württemberg (Cooke and Morgan, 1998) and the City of London (Thrift, 1994) but does not exclude, for example, the smaller districts of Emilia–Romagna in northern Italy (Brusco, 1982).[4]

## A MODEL OF KNOWLEDGE DISSEMINATION

Our model of knowledge diffusion in industrial agglomerations is an attempt to move beyond the distinction between tacit and codifiable knowledge that has underpinned a great deal of writing concerning agglomerations. Studies of agglomeration in economic geography have adopted a dichotomy between tacit and codifiable knowledge, as first promulgated by Michael

Polanyi (1966). Tacit knowledge is based on the idea that 'we can know more than we can tell' (Polanyi, 1966, p. 4) since there are many tasks that involve more skills and insights than can be written down on paper. Acquiring such knowledge often requires personal demonstration, experience, practice and imitation, and is therefore related to the idea of 'learning-by-doing' (Arrow, 1962). This means that tacit knowledge is often related to specific ways of doing things that emerge in particular places. It is thus argued that tacit knowledge is often context-dependent, being facilitated by a common language, culture and value system.

This concept of tacit knowledge can be used to explain the alleged competitive advantages enjoyed by clusters of small firms. Superior ways of designing, manufacturing and assembling products or delivering services can be facilitated by tacit forms of knowledge that are embedded in a local context and which are therefore difficult to transfer elsewhere.[5] Frequent face-to-face interactions between the numerous actors in such regions can facilitate the exchange of this knowledge through 'learning-by-doing'. This helps to explain the paradox of economically successful industrial clusters in an age in which new telecommunications systems facilitate the transfer of ever more complex sets of knowledge at an ever-increasing rate. Whilst new telecommunications systems can help with codifiable knowledge, the crucial tacit dimension often remains elusive and localised. This means that the more easily transferable becomes codifiable knowledge, the more precious become tacit forms of knowledge (see, for example, Gertler 1993; Maskell and Malmberg, 1999).

Tacit knowledge is seen as especially important at a time when economic competitiveness is crucially dependent upon technological superiority, product quality and the elusive concept of 'style'. This perspective on knowledge also fits in with what has been termed the knowledge-based view of the firm – the idea that knowledge is the crucial component in sustaining competitive advantage through innovation (Penrose, 1959; Kay, 1993; Grant, 1996). The knowledge-based view of the firm differs markedly from neoclassical economics and transactions-cost economics. Instead of being conceptualised as a set of responses to information or transaction costs, firms are seen essentially as repositories of skills, experience and knowledge (Knudsen, 1996; Malecki, 2000). Furthermore, in contrast to the traditional concept of comparative advantage, competitive advantage suggests that economic gains are not mutual: once a cluster forges a lead it can gain increasing returns at the expense of other regions.

However, in recent years this neat correlation of tacit knowledge with regionalisation, and codifiable knowledge with the global scale, has been questioned. For example, Amin and Thrift (2002) question the role of local proximity in fostering innovation based on tacit knowledge. To begin with

they note that, as initially recognised by Polanyi, tacit knowledge seldom works in isolation from codified knowledge; competitive advantage is a result of how the two are combined (see also Amin and Cohendet, 1999; see also Allen, 2000). Not only is codified knowledge effective when interpreted through a variety of tacit measures, but tacit knowledge often relies on codified manuals. Furthermore, both forms of knowledge are now widely dispersed in extensive transnational organisations based on communities of practice (Amin and Cohendet, 2004).

Our model of knowledge dissemination is derived from the knowledge-based view of the firm which focuses upon the internal knowledge assets and capabilities of the firm as a source of competitive advantage, rather than market position. Central to our approach is a distinction between two types of knowledge – component and architectural (see Table 5.1). This division was first developed by Henderson and Clark (1990) in the context of technical knowledge but was extended to firm-level knowledge in general by Matusik and Hill (1998). Our approach does not simply replace one dichotomy with another; rather, as we demonstrate below, it provides new insights into the reasons for competitive advantage in certain clusters. However, it is important to recognise at the outset that these are ideal types and, indeed, represent extremes at the end of a continuum rather than a dichotomy.

*Component knowledge* refers to those specific knowledge resources, skills and technologies that relate to identifiable *parts* of an organisational system, rather than to the whole. Component knowledge is therefore normally tied to the technology and operating norms of particular industrial sectors. For example, in high-technology-oriented industries, such as the 'high-tech clusters' analysed in detail in the chapter by Di Tommaso et al. (Chapter 13), such knowledge would include scientific, technical and design skills. In consumer industries it would include knowledge of consumer behaviour, marketing, sales and promotion.

Although all knowledge originally derives from a particular environment, as an ideal type, component knowledge can be regarded as acontextual and transparent to informed individuals within an organisation (McGaughey, 2002). A distinguishing feature of component knowledge therefore is the fact that it is often relatively codifiable and transferable. Despite legal protections including patents, copyright and restrictive clauses in employment contracts, component knowledge can often 'leak' out of originating firms fairly quickly. However, component knowledge is not the same as codifiable knowledge. Whilst some of the elements of component knowledge are relatively straightforward technical issues that are tangible and explicit, others involve complex systemic organisational routines that are intangible

and tacit. *Codified* component knowledge is therefore more transferable than *systemic* component knowledge.

In contrast to component knowledge, *architectural knowledge* relates to the organisation of an entire system and the structures and routines for organising its component knowledge for productive use (Matusik and Hill, 1998). It is therefore concerned with the relationship between an individual piece of component knowledge and an overall system of knowledge. Various terms have been used to capture aspects of architectural knowledge, including 'routines' (Nelson and Winter, 1982), 'organisational resources' (Barney, 1991), 'core competencies' (Prahalad and Hamel, 1990) and 'dynamic capabilities' (Teece et al., 1997) which all relate to the ability to adapt and develop architectural knowledge.

Architectural knowledge tends to be specific to, or embedded in, particular organisations within which it evolves endogenously over time in a complex trajectory. Since no two organisations have identical histories, no two organisations can have identical architectural knowledge – architectural knowledge is therefore highly path-dependent (Dierickx and Cool, 1989). Furthermore, whilst technical component knowledge is often codifiable in character, architectural knowledge is typically intangible and tacit in character. It is also typically tied to routines and capabilities that involve multiple individuals working in teams. Hence architectural knowledge is often widely dispersed through a unit or organisation and both its exact nature and ties to performance are likely to be ambiguous. Consequently, we argue that firm-level architectural knowledge primarily consists of stocks of knowledge and is a good source of competitive advantage for an individual firm. Crucially, architectural knowledge is also essential in determining the capacity of organisations to acquire, assimilate and adopt new knowledge – their 'absorptive capacity' (Zahra and George, 2002).

In recent work elsewhere (Pinch et al., 2003; Tallman et al., 2004), we have used the concept of architectural knowledge to account for the often-noted tendency for innovations in technology (i.e. forms of component knowledge) to be rapidly adopted by proximate firms in industrial agglomerations. We suggest that this is the product of a cluster-level architectural knowledge system. Since firm-specific architectural knowledge is relatively difficult to spread between firms (whether in a cluster or otherwise), cluster-level architectural knowledge is not knowledge that relates to any specific firm that has diffused throughout a cluster. Instead, it consists of a shared system for organising component knowledge that is common to a set of proximate firms. Just as architectural knowledge can increase the learning capacity – or absorptive capacity – of individual firms, we suggest that it can also increase the learning capacity of industrial clusters. Over time, firms in a cluster are likely to develop an inter-firm, cluster-specific stock

*Table 5.1 A summary of types of knowledge, their characteristics and effects at firm and cluster levels*

A: COMPONENT KNOWLEDGE

***Stocks and flows of knowledge***

- Describes an identifiable element of a body of knowledge
- Relates to exogenous conditions or laws
- Relatively transparent
- Runs from highly technical and codified to highly systemic
- Relatively mobile across organisations with similar stocks of knowledge

B: FIRM-SPECIFIC COMPONENT KNOWLEDGE

- Subject to discovery, runs from simple engineering knowledge to the application of scientific principles
- May be imported from another organisation or discipline
- Subject to regulatory protection
- Relatively mobile among firms or units with similar architectural knowledge
- Provides short-term competitive advantage to the firm while private to the innovating firm

C: CLUSTER-SPECIFIC COMPONENT KNOWLEDGE

- Quasi-public as it becomes available to all members of the cluster
- The more tacit and systemic, the more slowly it spreads through the cluster
- Subject to interpretation by individual firms as it is combined with their firm-specific knowledge
- Primary component of traded and untraded flows of knowledge among firms within the cluster
- Provides short-term competitive advantage to the cluster while public within the cluster

D: ARCHITECTURAL KNOWLEDGE

***Primarily stocks of knowledge***

- Relates to an understanding of a system of knowledge or organisation
- Path-dependent and endogenous to the system in which it is embedded
- Non-transparent and causally ambiguous

*Table 5.1 continued*

- Tacit, systemic and embedded in the organisation
- Relatively immobile between organisations at the level of knowledge

E: FIRM-SPECIFIC ARCHITECTURAL KNOWLEDGE

- Private knowledge of the firm's structure, systems, cultures, etc. arising from unique experience
- Includes routines for the absorption, organisation and exploitation of component knowledge into complex capabilities
- Organisationally embedded and dispersed
- Limits the ability of the firm to absorb knowledge from other firms
- Provides sustained firm-level competitive advantage

F: CLUSTER-SPECIFIC ARCHITECTURAL KNOWLEDGE

- Establishes the relationships among the members of the cluster, the 'rules of the game'
- Develops at the cluster level through evolutionary processes as the cluster members interact over time
- Increases absorptive capacity of members for component knowledge from the cluster
- Limits knowledge flows across cluster boundaries

of architectural knowledge that will distinguish the cluster from the rest of the industry. Common cluster-level architectural knowledge therefore increases the capacity of a cluster to absorb component knowledge from an individual firm in the cluster. It leads firms to seek similar component knowledge, incorporate it in similar ways, adapt it in ways that reflect common understandings, and apply it in a similar fashion in the marketplace. This dissemination of cluster-level component knowledge can give the agglomeration a relatively short-term competitive advantage before the knowledge is more generally diffused throughout the sector. Yet whilst the component knowledge may spread relatively quickly, the cluster-level architectural knowledge is, through its embedded character, much harder to spread and continues to give the cluster a competitive edge.

We have suggested that cluster-level architectural knowledge develops through the regular interactions of firms located in clusters, both formal and informal, traded and untraded. Architectural knowledge therefore reflects the socially embedded character of clusters and is bound up with issues of trust and reputation that facilitate the spread of component knowledge;

see, for example, Dupuy and Torre in Chapter 8. The rapid exchange of personnel within the cluster will, for example, facilitate knowledge flows relating to such issues. Architectural knowledge may therefore be regarded as constituting the 'rules of the game' that are available largely in a tacit form within the cluster. Following the terminology used by Cook and Brown (1999), cluster-level architectural knowledge may be regarded as a form of 'knowing' rather than 'knowledge'. Again, if we adopt the terminology of Brown and Duguid (2001), component knowledge constitutes the 'cargo' that is moved around on the 'rails' of cluster-level architectural knowledge. Firms outside the cluster that do not participate in the interactions are therefore less likely to develop the types of understandings necessary to become part of the cluster-level knowledge circulation system.[6]

## NATIONAL-LEVEL ARCHITECTURAL KNOWLEDGE?

Gertler (2001, 2003) has argued that the focus upon the region as a basis for sets of institutions that can facilitate learning and innovation has tended to divert attention away from national-level processes that can affect industrial competitiveness. These differences are not simply related to 'cultural' factors, but also to sets of norms, values and expectations that are deeply rooted in a common macro-regulatory environment.[7] Convincing evidence of this thesis is provided in a discussion of the difficulties Canadian firms have had in adopting advanced machine systems from Germany. The German tradition of extensive apprenticeship training and low labour turnover results in machines with a degree of sophistication that causes problems for Canadian firms with workers tutored in more 'flexible' North American style labour markets characterised by less training and higher rates of staff turnover (Gertler, 1995). One of the merits of Gertler's analysis is that these differences in factors affecting the adoption of machinery are not related to some innate national psyche but to concrete sets of institutions and the regulatory framework in which they operate. Thus Germany and Japan have differing cultures but regulatory structures that ensure there are greater benefits to firms that cooperate.

We have argued elsewhere that variation in levels of innovation between regions is, in part, related to regional-level architectural knowledge systems (Pinch et al., 2003). It is tempting in this context to extend this line of argument and to argue that many of the differences Gertler refers to can be related to variations in national-level forms of architectural knowledge. This may be regarded as a shared system for organising component knowledge that is common to a set of firms within a national (or international) regulatory framework. The regulatory regime surrounding German labour

markets results in machines that require a distinctive type of architectural knowledge to comprehend the substantial component knowledge (both tacit and explicit) necessary for their successful operation and maintenance. In contrast, the architectural knowledge system based on more flexible labour markets in the Canadian system needs machinery with instructions that are more explicit, codifiable and transferable.[8]

## ANALYSING ARCHITECTURAL KNOWLEDGE

One of the most intriguing, but conceptually difficult, elements of the model outlined above is the notion of architectural knowledge. We argue that it is a crucial element of firm competitiveness but also acknowledge that, by virtue of its largely tacit nature, this assertion is difficult to substantiate. We thus need to examine this notion in greater depth.

Some of the difficulties involved in understanding architectural knowledge were brought sharply into focus in the authors' analysis of the UK motor sport industry and 'Motor Sport Valley' (Pinch and Henry, 1999a, 1999b; Henry and Pinch, 2000, 2001). The two leading car manufacturers in Formula One (usually known as 'constructors') are Ferrari and McLaren. No other constructors have won so many races since the Second World War and yet the reasons for this success remain something of a mystery. In the case of McLaren this success is commonly attributed to numerous factors, including meticulous testing; highly disciplined organisation; paying special attention to the welfare needs of drivers, and making a special effort to keep financial backers happy. Yet, though important, such factors clearly only skim the surface of the deeply embedded processes in operation. Hagiographies of Formula One commonly attribute much of the success to the idiosyncratic management practices of two leading figures in each team – Ron Dennis in the case of McLaren and Luca do Montezemolo in the case of Ferrari. But whilst leading personnel may play a vital role in facilitating firm competitiveness, arguably, it is the way in which their ideas become widely dispersed, adopted and integrated into everyday working practices that is of crucial importance. What is widely acknowledged is that, although eventually adopting similar forms of technology, over the decades Ferrari and McLaren have tended to evolve different forms of working. For example, in Formula One terms Ferrari is a relatively large, somewhat insulated, organisation (Angus, 2002). McLaren, in contrast, tends more towards a more 'English' model with greater degrees of subcontracting to a regional network of smaller specialist component suppliers.

Getting respondents to articulate the crucial elements of a knowledge-based system can therefore be extremely difficult. To illustrate further, it was

not uncommon in our study for a key engineer to initially profess complete ignorance as to why the UK racing car industry had been so successful over the years. At first, all that might be offered were some well-established but highly dubious narratives about being prepared to 'work through lunch' (unlike continental European-based competitors) or being prepared to be more 'flexible'. Yet it was not long in many of these interviews before respondents began to talk in a highly articulate manner about a whole range of practices that accorded with the 'learning region' thesis. For example, one common theme was that there was an accepted 'English' way of doing things in the racing car industry that people living outside the UK were not so familiar with. Three factors made this argument especially convincing. First, it was supported by a wide range of evidence and anecdotes. One key theme was that many aspects of technical knowledge were well known throughout the world but their significance for racing car production was not realised by those working outside the UK. Evidence on innovation and technological adoption within the industry supports these claims (see, for example, Jenkins and Floyd, 2001). Second, some of the most articulate exponents of the 'English way' were overseas engineers attracted to the UK's Motor Sport Valley as the premier location for racing car production. Third, the argument was developed by people who were ignorant of the basic hypothesis we were scrutinising as researchers. When our key hypothesis was revealed later in the interviews, many respondents claimed to find this convincing and came up with even more examples. Since our initial work, 'Motor Sport Valley' has been adopted by the industry, its trade association and the regional and national government as an international brand for one of the UK's few world-class clusters. Arguably, since the narrative of 'Motor Sport Valley' has now become so firmly established, examining the validity of these ideas in a rigorous way is more difficult.

It should be clear from the above that it is not only the largely tacit nature of architectural knowledge that makes it so difficult to analyse; management scientists insist that it is not an attribute of specific individuals but something that is widely diffused among the actors within an organisation. Furthermore, architectural knowledge refers not so much to specific items of information but, rather, to accepted ways of learning and thinking. For this reason some authors insist that what amounts to architectural knowledge resides in the 'routines' that characterise the operations of organisations (see Nelson and Winter, 1982; Grant, 1996; Spender, 1996). This means that, despite all the bold claims of management gurus, knowledge resources that are crucial to firm competitiveness may be at the margin of managerial understanding and therefore left 'unmanaged '. As Grant (1996) notes, 'organizational routines involve a large component of tacit knowledge which implies limits on the extent to which an organization's capabilities can be articulated' (p. 110).

To analyse these issues Ambrosini and Bowman (2002) suggest that tacit routines can involve at least three elements: that which is genuinely inarticulable; that which is imperfectly inarticulable; and that which can be articulated but of which the respondents are not fully aware. Obviously, it is only the latter two categories that can be analysed with any degree of confidence. In order to do this Ambrosini and Bowman suggest the use of the technique of 'cognitive mapping'. This approach involves:

1. Preliminary interviews with various personnel about what causes success in the organisation.
2. Mapping the responses into a preliminary 'cognitive structure'.
3. Re-interrogating respondents over the resulting findings (paying special attention to variations in the responses of individuals).
4. Repeating the above process in further interviews. This enables cross-checking of the veracity of the respondents' views.

Such in-depth qualitative approaches are likely to produce rather different types of data to quantitative aggregate analyses of information flows as measured by factors such as patent citations (see, for example, Jaffe et al., 1993; Almeida, 1996). Nevertheless, we argue that the former approach is essential to provide necessary corroborative evidence of the detailed processes that lead to asymmetries in knowledge flows. Whilst much work needs to be done, there are already plenty of examples of the power of place to affect architectural knowledge and thereby impede information spread. The classic example is probably the failure of knowledge concerning the potential of the PC to spread from Xerox's west coast research arm in the USA to the east coast headquarters of the same corporation. Instead it was nearby personnel at rival Apple who recognised, and acted upon, this knowledge to stunning competitive effect (Schoenberger, 1997). In a similar fashion, in the 1970s and 1980s, the racing car company Ferrari, based in northern Italy, had problems in understanding the complex art of 'ground effects' that spread relatively easily among closely grouped racing car constructors in southern England (Henry and Pinch, 2000; Pinch et al., 2003). It was only after poaching staff from the UK and then setting up a design base in southern England that Ferrari was able to overcome this asymmetry in knowledge spread. Such actions, and other evidence, support the postulation that Ferrari's architectural knowledge system was rather different in form to those found in southern England. Ultimately, these and other examples serve to refute Krugman's now famous assertion that 'Knowledge flows … are invisible; they leave no paper trail by which they may be measured and tracked, and there is nothing to prevent the theorist from assuming anything about them that she likes' (Krugman, 1991, p. 55).

# CONCLUSIONS

Our starting point for this chapter has been to argue that the current resurgence of clusters can, at least in part, be understood through the lens of the knowledge-based or learning economy. We wish to stress that clusters are only one spatial expression of the new economic geography of urban and regional development. In addition, knowledge and learning must be placed alongside, or combined with, a number of other historical understandings of the dynamics of cluster formation and economic competitiveness. It is in this sense that we would seek to put clusters 'in their place', a place that would lower them from the policy pedestal that they have come to occupy, often at the expense of a broader recognition of the diversity of economic processes and economic geographies prevalent within the contemporary economy.

Drawing on the knowledge-based view of the firm within strategic management studies, we have argued that architectural knowledge, by virtue of its critical impact upon the capacity of firms to assimilate, adopt and exploit new forms of knowledge, plays a crucial role in determining economic competitiveness. Here, and elsewhere, we have proposed a model of knowledge dissemination between, and within, firms that can account for differing levels of economic performance by firms within, and outside, clusters over time. Nevertheless, we have also acknowledged the methodological difficulties involved in analysing this concept of architectural knowledge, with its complex mix of tacit and codifiable elements.[9]

We hope that the discussion and brief examples cited here will further our case. To those who remain sceptical (at least in the UK) we would draw their attention to the rigorous efforts made by some departments in British universities to increase their research status in the last decade in the light of various national research assessment exercises. Some departments have been consistently successful in these evaluation exercises and, understandably, this has frequently resulted in efforts at emulation by rival departments in other universities. In some cases this has involved 'poaching' of leading academic 'stars' (a process not unlike the frenetic game of 'musical chairs' that arises in the motor sport industry as leading engineers and designers move between rival racing car companies). Yet although there are substantial transfers of knowledge resulting from these efforts, it would seem that, perhaps inevitably, something gets lost in the translation of these ideas from other contexts. The reason for this difficulty is that, as with firms, each academic department evolves with its own unique evolutionary trajectory involving unique people, policies and practices. Of course, all departments do broadly similar things, especially in response to the growing national regulation in the UK context, but these things are accomplished in subtly different

ways in different contexts. In other words, we suggest that each department develops its own unique architectural knowledge system.

Finally, we pursue the role of knowledge and learning in cluster analysis in the belief that any subsequent understanding provides policy options, as well as theoretical outcomes. Two immediate examples may be cited. First, recent work on the Third Italy highlights the economic stress that this paradigmatic industrial system is currently under and the process of 'unravelling' that is taking place as new, lower-cost, subcontractors and locations have entered the production system (Amin, 1999). Whilst analysis of the transaction costs of the districts continues apace, a knowledge-based perspective might suggest an understanding as to how the districts have been drawn in to a cost minimisation development trajectory in contrast to the design-led position they once held (see, for example, Grandinetti and Tabacca, 2003). Have the districts lost their ability to learn, and their virtuous system of innovative design, production and marketing? Similarly, and second, the work of Cooke et al. (2003) on the knowledge value chain in life sciences highlights how the development pathways and possibilities of different places and regions may be understood, including the role of life science clusters, and the appropriate (and realistic) response for policy makers seeking to develop a sustainable position within the knowledge-based economy.

The new economic geographies of the twenty-first century are fertile ground driving new ways of theorising, and investigating, processes of economic development. Clusters remain at the forefront of those investigations, and the processes of knowledge and learning a dynamic and fruitful arena of explanation.

# NOTES

1. See also similar criticisms in the chapters in this volume by Sudgen et al. (Chapter 3) and Pitelis and Psieridis (Chapter 2), and, in the chapter by Aranguren et al. (Chapter 12), witness a descriptive analysis of top–down cluster policy in action in the Basque Country region of Spain.
2. See also the framework developed by Pitelis and Psieridis in Chapter 2 of this volume, for example.
3. This view appears consistent with the inherently multidisciplinary methodological framework proposed by Sugden et al. in Chapter 3 of this volume.
4. Compare also discussion on the definition of clusters in other chapters in this volume, in particular those by Bellandi (Chapter 4), Pitelis and Psieridis (Chapter 2), Parrilli (Chapter 10), Di Tommaso et al. (Chapter 13), and Sugden et al. (Chapter 3).
5. Indeed, in Chapter 6 of this volume De Propris and Driffield argue that accumulated knowledge in clusters can be instrumental in the strategic attraction of quality FDI from firms that are seeking to source knowledge.
6. This also appears related to the concept of 'specific public goods' analysed by Bellandi in Chapter 4.

7. Quintana and Pulignano's discussion of industrial relations in Chapter 9, for example, also draws attention to such national differences, and Gilly and Perrat in Chapter 7 discuss more generally the tensions between different scales of regulatory environment.
8. It may be that the concept of national-level architectural knowledge could be fruitfully developed alongside that of National Innovation Systems (NIS). See, for example, Bergman et al. (2001).
9. See Yeung (2003) for a discussion of the methodological challenges facing economic geography as it has experienced a paradigm shift in its theoretical and epistemological base, and Huff and Jenkins (2002) for an example of the methodological techniques that the discipline may need to engage with in order to validate many of its most recent theoretical propositions.

# REFERENCES

Allen, J. (2000), 'Power/economic knowledge: symbolic and spatial formations', in J.R. Bryson, P.W. Daniels, N. Henry and J. Pollard (eds), *Knowledge, Space, Economy*, London: Routledge.

Almeida, P. (1996), 'Knowledge sourcing to foreign multinationals: patent citation analysis of the US semi-conductor industry', *Strategic Management Journal*, **7**, 155–65.

Ambrosini, V. and Bowman, C. (2001), 'Tacit knowledge: some suggestions for operationalization', *Journal of Management Studies*, **38**, 811–29.

Amin, A. (1999), 'The Emilian model: institutional challenges', *European Planning Studies*, **7**, 389–405.

Amin, A. (2000), 'Industrial districts', in E. Sheppard and T.J. Barnes (eds), *A Companion to Economic Geography*, Oxford: Blackwell.

Amin, A. and Cohendet, P. (1999), 'Learning and adaptation in decentralised business networks', *Society and Space*, **17**, 87–104.

Amin, A. and Cohendet, P. (2004), *Architectures of Knowledge: Firms, Capabilities and Communities*, Oxford: Oxford University Press.

Amin, A. and Thrift, N. (1992), 'Neo-Marshallian nodes in global networks', *International Journal of Urban and Regional Research*, **16**, 571–87.

Amin, A. and Thrift, N. (2002), *Cities: Reimaging the Urban*, Oxford: Polity Press.

Angus, T. (2002), *The Italian Motorsport Industry: An Executive Summary*, Stoneleigh, Warwickshire: Motorsport Industry Association.

Arrow, K.J. (1962), 'The economic implications of learning-by-doing', *Review of Economic Studies*, **29**, 155–73.

Barnes, T. (2001), 'Retheorizing economic geography: from the quantitative revolution to the "cultural turn"', *Annals of the Association of American Geographers*, **91**, 546–65.

Barney, J.B. (1991), 'Firm resources and sustained competitive advantage', *Journal of Management*, **17**, 99–120.

Becattini, G. (1990), 'The Marshallian industrial district as a socio-economic notion', in F. Pyke, G. Becattini and W. Segenberger (eds), *Industrial Districts and Inter-Firm Co-operation in Italy*, Geneva: ILO.

Benneworth, P. and Henry, N. (2004), 'Where is the value-added in the cluster approach? Hermeneutic theorizing, economic geography and clusters as a multi-perspectival approach', *Urban Studies*, **41** (5/6), 1011–24.

Benneworth, P., Raines, P., Danson, M. and Whittam, G. (2003), 'Confusing clusters? Making sense of the cluster approach in theory and practice', *European Planning Studies*, **11**, 511–20.

Bergman, E.M., den Hertog, P., Charles, D.R. and Remoe, S. (eds) (2001), *Innovative Clusters: Drivers of National Innovation Systems*, Paris: OECD.

Brown, J.S. and Duguid, P. (2001), 'Knowledge and organization: a social-practice perspective', *Organization Science*, **12**, 198–213.

Brusco, S. (1982), 'The Emilian model: productive decentralisation and social integration', *Cambridge Journal of Economics*, **6**, 167–84.

Bryson, J., Daniels, P., Henry N. and Pollard, J. (eds) (2000), *Knowledge, Space, Economy*, London: Routledge.

Campagni, R. (1991), 'Introduction: from the local "milieu" to innovation through co-operation networks', in R. Campagni (ed.), *Innovation Networks: Spatial Perspectives*, London: Belhaven Press.

Cook, S.D.N. and Brown, J.S. (1999), 'Bridging epistemologies: the generative dance between organisational knowledge and organisational knowing', *Organization Science*, **10**, 381–400.

Cooke, P. (2002), *Knowledge Economies: Clusters, Learning and Co-operative Advantage* London: Routledge.

Cooke, P., Kaufman, D. and Levin, C. (2003), 'The biosciences knowledge value chain and comparative incubation models', paper presented to the Regional Studies Association Conference on 'Reinventing Regions in the Global Economy', Scuola Superiore Sant' Anna, Pisa, Italy, 12–15 April.

Cooke, P. and Morgan, K. (1998), *The Associational Economy: Firms, Regions and Innovation*, Oxford: Oxford University Press.

Dierickx, I. and Cool, K. (1989), 'Asset stock accumulation and competitive advantage', *Management Science*, **12**, 1504–11.

Florida, R. (1995), 'Towards the learning region', *Futures*, **27**, 527–36.

Gertler, M. (1993), 'Implementing advanced manufacturing technologies in mature industrial regions: towards a social model of technology production', *Regional Studies*, **27**, 259–78.

Gertler, M. (1995), '"Being there": proximity, organization, and culture in the development and adoption of advanced manufacturing technologies', *Economic Geography*, **71**, 1–16.

Gertler, M.S. (2001), 'Best practice? Geography, learning and the institutional limits to strong convergence', *Journal of Economic Geography*, **1**, 5–26.

Gertler, M.S. (2003), 'Tacit knowledge and the economic geography of context, or the undefinable tacitness of being (there)', *Journal of Economic Geography*, **3**, 75–99.

Gordon, I.R. and McCann, P. (2000), 'Industrial clusters: complexes, agglomeration and/or social networks?', *Urban Studies*, **37**, 513–32.

Grandinetti, R. and Tabacca, R. (2003), 'Formation and evolution of industrial districts: a knowledge-based perspective for industrial district research', paper presented to the Regional Studies Association Conference on 'Reinventing Regions in the Global Economy', Scuola Superiore Sant' Anna, Pisa, Italy, 12–15 April.

Grant, R.M. (1996), 'Toward a knowledge-based theory of the firm', *Strategic Management Journal*, **17** (Winter), 109–22.

Henderson, R. and Clark, K.B. (1990), 'Architectural innovation; the reconfiguration of existing product technologies and the failure of established firms', *Administrative Science Quarterly*, **35**, 1–30.

Henry, N. and Pinch, S. (2000), 'Spatialising knowledge: placing the knowledge community of Motor Sport Valley', *Geoforum*, **31**, 191–208.

Henry, N. and Pinch, S. (2001), 'Neo-Marshallian nodes, institutional thickness and Britain's "Motor Sport Valley"', *Environment and Planning A*, **33**,1169–83.

Huff, A.S. and Jenkins, M. (eds) (2002), *Mapping Strategic Knowledge*, London: Sage Publications.

Jaffe, A., Trajtenberg, M. and Hendersen, R. (1993), 'Geographic localization of knowledge spillovers as evidenced by patent citation analysis', *Quarterly Journal of Economics*, **105**, 577–98.

Jenkins, M. and Floyd, S. (2001), 'Trajectories in the evolution of technology: A multi-level study of competition in Formula 1 racing', *Organization Studies*, **22** (6), 945–69.

Kay, J. (1993), *Foundations of Corporate Success*, Oxford: Oxford University Press.

Keeble, D. and Nachum, L. (2002), 'Why do business service firms cluster? Small consultancies, clustering and decentralisation in London and southern England', *Transactions of the Institute of British Geographers*, **27**, 67–90.

Knudsen, C. (1996), 'The competence perspective: a historical view', in N.J. Foss and C. Knudsen (eds), *Towards a Competence Theory of the Firm*, London: Routledge.

Krugman, P. (1991), *Geography and Trade*, Cambridge, MA: MIT Press.

Lovering, J. (1999), 'Theory led by policy: the inadequacies of the "New Regionalism"', *International Journal of Urban and Regional Research*, **23**, 375–95.

Maillat, D. (1995), 'Territorial dynamics, innovative milieu and regional policy', *Entrepreneurship and Regional Development*, **7**, 157–65.

Malecki, E.J. (2000), 'Creating and sustaining competitiveness: local knowledge and economic geography', in J.R. Bryson, P.W. Daniels, N. Henry and J. Pollard (eds), *Knowledge, Space*, *Economy*, London: Routledge.

Markusen, A. (1999), 'Fuzzy concepts, scanty evidence, policy distance: the case for rigour and policy relevance in critical regional studies', *Regional Studies*, **33**, 869–84.

Marshall, A. (1919) *Industry and Trade*, London: Macmillan.

Martin, R. and Sunley, P. (2003), 'Deconstructing clusters: chaotic concept or policy panacea?', *Journal of Economic Geography*, **3**, 5–35.

Maskell, P. (2001), 'Towards a knowledge-based theory of the geographical cluster', *Industrial and Corporate Change*, **10**, 921–43.

Maskell, P. and Malmberg, A. (1999), 'The competitiveness of firms and regions: "ubiquitification" and the importance of localized learning', *European Urban and Regional Studies*, **6**, 9–25.

Matusik, S. and Hill, C.W.L. (1998), 'The utilisation of contingent work, knowledge creation and competitive advantage', *Academy of Management Review*, **23**, 680–97.

McGaughey, S.L. (2002), 'Strategic interventions in intellectual asset flow', *Academy of Management Review*, **27**, 248–74.

Nelson, R. and Winter, S. (1982), *An Evolutionary Theory of Economic Change*, Cambridge, MA: Harvard University Press.

Newlands, D. (2003), 'Competition and cooperation in industrial clusters: the implications for public policy', *European Planning Studies*, **11**, 521–32.

Penrose, E. (1959), *The Theory of the Growth of the Firm*, New York: Rinehart.

Pinch, S. and Henry, N. (1999a), 'Discursive aspects of technological innovation: the case of the British motor sport industry', *Environment and Planning A*, **31**, 665–82.

Pinch, S. and Henry, N. (1999b), 'Paul Krugman's geographical economics, industrial clustering and the British motor sport industry', *Regional Studies*, **33**, 815–27.

Pinch, S., Henry, N., Jenkins, M. and Tallman, S. (2003), 'From industrial districts to knowledge clusters: a model of knowledge dissemination and competitive advantage in industrial agglomerations', *Journal of Economic Geography*, **3** (4), 373–88.

Polanyi, M. (1966), *The Tacit Dimension*, New York: Doubleday.

Porter, M.E. (1998), 'Clusters and the new economics of competition', *Harvard Business Review*, Nov.–Dec., 77–90.

Prahalad, C.K. and Hamel, G. (1990), 'The core competence of the corporation', *Harvard Business Review*, May.

Saxenian, A.L. (1994), *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*, Cambridge, MA: Harvard University Press.

Schoenberger, E. (1997), *The Cultural Crisis of the Firm*. Oxford: Blackwell.

Scott, A.J. (1988), *New Industrial Spaces: Flexible Production Organization and Regional Development in North America and Western Europe*, London: Pion.

Simmie, J. and Hart, D.A. (1999), 'Innovation projects and local production networks: a case study of Hertfordshire', *European Planning Studies*, **7**, 445–62.

Simmie, J. and Sennett, J. (1999), 'Innovative clusters: global or local linkages?', *National Institute Economic Review*, October, 87–98.

Spender, J.-C. (1996), 'Making knowledge the basis of a dynamic theory of the firm', *Strategic Management Journal*, **17**, Winter special issue, 45–62.

Storper, M. (1995), 'The resurgence of regional economies ten years later: the region as a nexus of untraded interdependencies', *European Urban and Regional Studies*, **2**, 191–221.

Tallman, S., Jenkins, M., Henry, N. and Pinch, S. (2004), 'Knowledge clusters and competitive advantage', *Academy of Management Review*, **29**, 258–71.

Teece, D., Pisano, G. and Shuen, A. (1997), 'Dynamic capabilities and strategic management', *Strategic Management Journal*, **18**, 509–33.

Thrift, N. (1994), 'On the social and cultural determinants of international financial centres: the case of the City of London', in S. Corbridge, R. Martin and N. Thrift (eds), *Money, Power and Space* Oxford: Blackwell, pp. 327–55.

Yeung, H.W. (2003), 'Practicing new economic geographies: a methodological examination', *Annals of the Association of American Geographers*, **93**, 42–62.

Zahra, S.A. and George, G. (2002), 'Absorptive capacity: a review, reconceptualization, and extension', *Academy of Management Review*, **27**, 185–203.

# 6. FDI, clusters and knowledge sourcing*

**Lisa De Propris and Nigel Driffield**

## 1. INTRODUCTION

The process of globalisation of production activities has highlighted a tension between the 'global' and the 'local' perspectives on the forces for development. As markets have become global, so has firms' division of labour, with firms having become multinational, multi-plant and multisectoral. The global dimension of production and innovation processes has emphasised the need for localities to be competitive in such a global market. This is leading to what Cantwell and Iammarino (2002, p. 293) call the 'geographical hierarchy of regional centres': namely, the ranking of regions according to their competitive advantage and their local competences. Globalisation has, therefore, exacerbated the divide between core and peripheral regions, and between competitive and backward regions, a situation first outlined by Hymer (1975).

The most common form of development policy that has been pursued in order to link localities to global markets has been to offer financial and other inducements to multinational enterprises (hereafter MNEs) in order to encourage the establishment of local production facilities. These policies are discussed in Taylor and Wren (1997), for example. While this is done partly in order to benefit from expected direct and indirect employment increases, there is an expectation among many agencies that the benefits of foreign direct investment (hereafter FDI) will extend beyond those of employment. Policy makers are clearly alive to this possibility. In the UK, for example, inward investment bodies such as Scottish Enterprise have long encouraged MNEs to locate research and other high-level functions in their areas, in the explicit belief that local firms will benefit from spillover benefits which are unlikely to be present in mere assembly operations. The mechanisms by which these spillovers are anticipated to occur are discussed at length in Görg and Greenaway (2002), for example.

This literature, and indeed the wider literature concerned with FDI and regional development (see for example Driffield, 2004) makes the link between inward investment and clusters of domestic activity, although the direction of causation is far from clear. For example, Turok (1993, 1997), Phelps (1993) and Shirlow (1995) have all argued that despite efforts by regional development agencies to generate linkages between inward investors and local firms, these are at best fragile. While Markusen and Venables (1999) show that, theoretically, inward investment can lead to indigenous cluster development through linkages, there is little evidence of this beyond what De Propris (2001) refers to as monopsonistic clusters. This is discussed in more detail below. Such results can be seen in the context of the beneficial effects of inward investment as expressed by Porter (1996). Porter argues that the beneficial effects of inward FDI are maximised when a location is intrinsically attractive to international capital, rather then where location is determined through subsidy. In terms of the spillovers literature for example, Blomström et al. (2001) argue that absorptive capacity of the domestic sector is the overriding determinant in the scale and scope of spillovers.

The debate on regional development and regeneration suggests that one of the sources of competitiveness for localities is the presence of clusters or, more generally, of firm agglomerations (Porter, 2000; Cossentino et al., 1996).[1] The essential questions are, therefore, (a) what type of clusters can be generated around MNEs; and (b) whether FDI-generated clusters can trigger processes of sustainable development for regions and localities. While foreign investments may generate a concentration of activity, they are not 'clusters' in any real sense, rather a few small domestic firms providing low-value-added services to a large foreign subsidiary with high import intensity. In such cases, therefore, the potential for technology transfer between the sectors, or inward investment generating productivity growth in the domestic sector, is limited. As Morgan (1997) notes, the policy of subsidising inward investment was designed to address the symptoms of regional disparities, such as unemployment, rather than the underlying causes, such as low levels of technological development. It has been this short-termism in the definition of the objectives and targets of inward investment that has prevented policy makers from formulating a strategy where the priority is not only the attraction, but, most important, the retention of and actual desirable impact of FDI in the long run.

Evidence seems to suggest that FDI-generated clusters are extremely fragile as their survival depends on the MNE. The possibility of inward investment contributing to regions' sustainable competitive advantage is often undermined by changes in the micro- (e.g. taxation, labour costs) or macro- (e.g. sterling exchange rate) economic context. In fact, multinational enterprises are more footloose than indigenous firms and they respond

differently to changes in the factors determining firms' survival, so that when the economic conditions change against their own benefit they look out for a context that is compatible with their needs and easily relocate (on the Irish case, see Görg and Strobl, 2003). The restructuring, relocation, sale or closure of plants by MNEs is evidence that a region's over-reliance on international capital may be misplaced.

The standard theory of the multinational enterprise, dating back to Buckley and Casson (1976), suggests that firms engage in FDI merely to transfer their specific assets across national boundaries within the firm, with location in part determined by location advantages, which in recent years has come to include subsidies.

There is evidence that spillovers do accrue to the domestic sector as a result of inward FDI, but only under certain circumstances; see for example Blomström et al. (2001), or Markusen and Venables (1999). Blomström et al. (2001), however, argue that regions in possession of significant location advantages will be those best placed to gain most from the foreign presence. In cases where the agglomeration of activity has centred on inward investment, there is little evidence that this forms a 'cluster' in the true sense of the word. Our concern is on the governance structure of this type of cluster and its impact on the sustainability and desirability of this path of regional development, a theme that is also explored in the chapters in this volume by Gilly and Perrat (Chapter 7), Sacchetti and Tomlinson (Chapter 11), and Sugden et al. (Chapter 3). In fact, FDI-generated clusters are likely to be characterised by asymmetric decision-making power between the MNE and the supply chain. In monopsonistic clusters, the market power lies solely with the MNE (typically a purchaser of local inputs), with low levels of technology transfer between the foreign and domestic sectors. The debate concerning the 'embeddedness' of MNEs has also been understood for some time, see for example Turok (1997), with the likelihood of spillovers in such cases discussed at length in Driffield and Love (2002). Inward investment policies have been based on the assumed causal link between inward investment and regional development. The argument for subsidising inward investment is based on 'superior' MNEs entering the domestic industry, and their advantages somehow being assimilated by the domestic sector. Part of this explanation is based on inter-industry adjustment, including a reallocation of resources to industry sectors of above average industry comparative advantage. On a regional level, new foreign manufacturing investment can also have beneficial economic consequences. In addition to job creation and resource transfer, foreign inward investments can also provide technology and skills transfer to supplier and customer sectors. Multinational enterprise may then provide a basis for technology spillovers

and the development of innovation capacity in domestically owned sectors (Blomström and Kokko, 1996).

The policy of seeking to attract FDI by subsidy fits naturally with the dominant theoretical perspective on the determinants of FDI, which suggests that firms will use FDI as a method of entering foreign markets where they possess some knowledge-based 'ownership' advantage which cannot easily be exploited by some other route such as licensing. More recently, however, there has been increasing theoretical and empirical emphasis on technology or knowledge sourcing rather than technology exploitation as a motivation for FDI.

In this work we seek to reconcile the two literatures which have so far been kept apart: the firm-based international economics literature on FDI and the regional science literature on indigenous clusters and local development. We suggest a new way of looking at the relationship between FDI and clusters, no longer with clusters as the outcome of FDI, but as the precondition for a strategic attraction of quality FDI. Over the past 20 years there has been a good deal of debate concerning the 'commitment' that foreign firms have to a particular location. This concept dates back to McAleese and Counahan (1979), and was summarised more recently in Görg and Strobl (2003), who suggest that foreign firms in a particular location may be more likely to exit a particular location, but that employment in MNEs is no less stable than employment in local firms. This result they ascribe to the inherent advantages that MNEs must have over domestic firms in order to become multinational. This is very much in line with the traditional view of FDI based on firm-specific advantages.

We intend, therefore, to reconsider the role of FDI for regional development especially if the impact of FDI is expected to be sustainable over a long-term horizon, rather than being a short-term job creation panacea. Regional development cannot be pursued via a cluster policy where clusters are to be generated by inward investments. In contrast, cluster policy has to be a condition for the attraction of 'quality' FDI. For this reason, the objective of cluster policy has to be the support of local and embedded competencies that can lead to the formation of clusters. As centres of accumulated knowledge, these will then become attractive localities for MNEs, in that the latter would be attracted not by mobile production inputs (e.g. cheap labour, incentives), but by location-specific production inputs. In other words, cluster policy has to set the scene for a strategic and selective process of targeting and attracting FDI.

We present the results of two empirical works. In one we investigate the relationship between domestic firms (both within and outside clusters) and inward investors from the perspective of technology flows and spillovers in the UK (De Propris and Driffield, 2005). In the other we look at the importance

of local industrial systems (henceforth LISs) and Marshallian industrial districts (henceforth MIDs) as attractive destinations for foreign investment in Italy (De Propris and Driffield, 2005; De Propris et al., 2003).

We are therefore advocating for an FDI policy that is integrated in a broader framework of regional development policy and cluster policy.

The chapter will proceed as follows. Section 2 will discuss the theoretical framework for evaluating the importance of agglomeration. Section 3 will present the most recent contributions seeking to determine the scale and scope of technology of productivity spillovers from inward investment. Section 4 will bring together these literatures, and discuss the importance of clusters and agglomeration in attracting FDI. Section 5 will discuss the motivation for firms to undertake FDI within this context, and, specifically, the technology sourcing motive for MNEs to enter clusters. Some empirical findings will be presented in Section 6 and, finally, Sections 7 and 8 will discuss policy implications and conclude the chapter.

## 2. LOCAL PRODUCTION SYSTEMS

Recent work on regional development and regeneration suggests that one of the sources of competitiveness for localities is the presence of local production systems (henceforth LPSs) (Porter, 2000; Cossentino et al., 1996; Becattini, 2004). Given the current competitiveness challenge, LPSs have proved to be able to provide the necessary production and output flexibility as required by the market together with high levels of specialisation and competence. Moreover, the positive externalities generated by the closeness of many firms specialised in a particular sector so tightly intertwined through production transactions and social relationships have triggered processes of innovation and learning.

As is well understood, agglomeration economies are generated by technological externalities derived from the geographical proximity of a critical mass of firms specialised in one or more related sectors. LPS economies are, however, more specific, as they are characterised by interactions between local firms and institutions (Storper, 1995). LPSs present a more flexible and complex system of production coordination, generating superior performance in terms of production efficiency and learning processes. Storper (1995) also stresses the intangible factors that are important determinants of a region's competitiveness. He defines the LPS as a 'nexus of untraded interdependencies', stressing how strong competitive regions develop successful models of production that cannot be easily imitated or translated to other locations. They are embedded in the underlying system of shared conventions and norms.

Marshallian industrial districts (MIDs) are a particular type of LPS. Becattini (1979, 1987, 2000) has argued that MIDs provide firms with additional competitive advantages in terms of production and output flexibilities. These stem from collective learning, and the coordination and integration between economic activities, local community values and institutions. Becattini (1990, p. 38) defines the industrial district as 'a territorial entity characterised by the active presence of a group of persons and a population of firms in a given historical and geographical dimension'. This definition highlights the strong interplay of social and economic factors as basic conditions for the successful development of industrial districts. Industrial districts are characterised by a high degree of specialisation and complementarity. This generates dynamic processes of knowledge creation (learning and innovation) and knowledge transfer (diffusion and synergies).[2]

An innovative and competitive district can produce positive externalities to its entire region, in that as it grows, the extent of vertical and horizontal product differentiation increases. As a result, the industrial district becomes a centre of accumulated competencies across a range of related industries, and across various stages of production (the so-called production *filière*).

Recently, studies on industrial districts in Italy (Becattini, 2004; Cossentino et al., 1996; Leonardi and Nanetti, 1994); clusters in Portugal (Porter, 1998), in the USA (Porter, 2000) and in Norway (Bjorn and Isaksen, 1997); innovative *milieux* in France (Longhi, 1999); and clusters in developing countries (Rabellotti, 1997; Guerrieri et al., 2001) have strengthened the argument that agglomerations of small and medium-sized firms can catalyse regional industrial competitiveness. The sources of localities' competitive advantages are industrial specialisation, external division of labour, agglomeration and external economies, embedded competencies, and a balance between competition and cooperation, so called 'co-opetion' (Nalebuff, 1996).

Definitions of LPSs have become increasingly fragmented as they have been defined and redefined in an attempt to capture the exclusive and unique nature of certain (local) realities in relation to others. As a result, it is now argued that the concept of 'cluster' has increasingly become a 'chaotic concept' too fuzzy to be pinned down (Martin and Sunley, 2003). Markusen (1996), Gordon and McCann (2000), Simmie and Sennett (1999) and Belussi and Arcangeli (1998) have all suggested possible typologies, which are all based on an in-depth analysis of clusters on a case-by-case basis. Martin and Sunley (2003) argue that 'cluster' definitions tend to stress geographical proximity, technological proximity, production complementarities, external economy or the presence of intangible assets.

Aware of this 'chaos', or maybe because of it, we feel it is absolutely crucial to clarify our language and the meaning of our words. We distinguish forms of firms' agglomeration according to three coordinates: structure of governance (namely, the allocation of power between firms within the system's decision-making process), the thickness of inter-firm relationships and the presence of learning processes.

A simplification is instrumental to understand complex clustering realities that can range on a spectrum of continuous options. Conceptually we distinguish between five forms of firm agglomerations: local production systems, Porter's clusters, monopsonistic clusters, MIDs, and innovative milieux. In Figure 6.1, we show how these five forms differ from one another.

First, the governance structure can vary from being hierarchical and centralised (ranked 1 along the axis), as in monopsonistic clusters, to being heterarchical and flat (ranked 5 along the axis), as in MIDs. In fact, whilst monopsonistic clusters (De Propris, 2001; Markusen, 1996) pivot around one or a few buyers (in this case oligopsonistic clusters) who polarise the production activities of all the cluster, MIDs are characterised by the presence of a large number of small and medium-sized firms, each specialised in complementary and therefore integrated production activities. Between

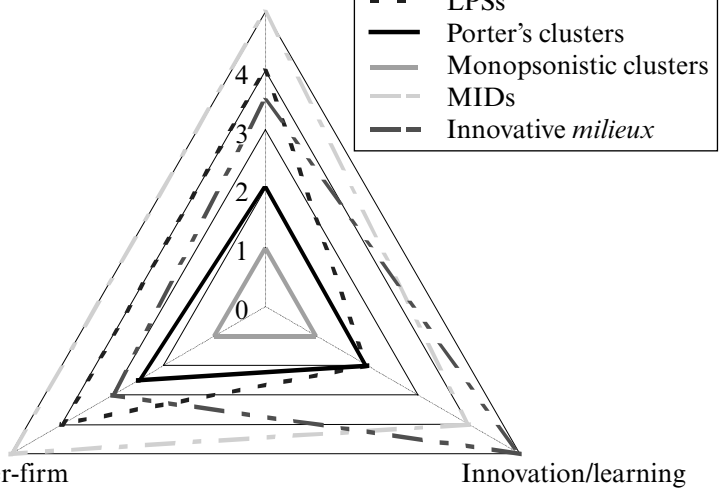



*Figure 6.1 Differences in forms of agglomeration*

these extremes there are hybrid forms, whereby Porter's clusters result in being more vertically structured than innovative *milieux*, for instance, given the accepted presence of large firms.[3]

Second, firm agglomerations differ in the nature of inter-firm relationships. Whilst MIDs embody a complex and articulate web of inter-firm relationships (ranked 5 along the axis) that span from production to social links, monopsonistic clusters and Porter's clusters are characterised by simple production exchanges. Porter's clusters (Porter, 1998) tend to be characterised by an agglomeration of firms where there are small, medium and large firms. Production is fragmented and there is cooperation between firms, especially on production-related issues. In MIDs, in fact, the agglomeration of firms overlaps with the community of people that generates social capital as well as a fluid mechanism of information and knowledge exchange (Becattini, 1987; Pyke et al., 1990). Innovative *milieux* and LPSs are somewhere in between, as inter-firm relationships are channels for production transactions as well as knowledge and information exchanges.

Finally, we distinguish firm agglomerations according to their learning and knowledge creation capacity. Innovative *milieux* (ranked 5 along the axis) and MIDs are the most innovative forms of agglomeration, whereas monopsonistic clusters and Porter's clusters are not conducive to innovation. In fact, the former can often be a network of low-value-added manufacturing activities hubbing around one main buyer, while the latter might not necessarily produce learning and innovation as firms' advantages derive mainly from low transport costs and production specialisation.

We would suggest that different forms of firm agglomeration are associated with different patterns of regional/local development, as they promote the creation of competitive factors that are more or less embedded in the locality. We would argue, therefore, that the identification of a typology of firm agglomerations is important in identifying desirable forms of firm agglomeration capable of promoting a sustainable regional development. The questions to be addressed are:

- Is a particular form of agglomeration more likely than another to contribute to regional development?
- What forms of agglomeration are stimulated by inward investment, and is this appropriate for the host region?
- To what extent is agglomeration important in explaining the location of internationally mobile capital?
- Finally, is the beneficial impact of inward investment on the local economy greater where the MNE forms links with pre-existing agglomerations?

# 3. INWARD INVESTMENT AND SPILLOVERS

Dunning (1993) demonstrates why so many researchers and policy makers assume the existence of spillovers from FDI. This is based on the dominant model of the motivations for a firm to enter a foreign market through FDI, which has changed little since the seminal works of Dunning (1958) and Vernon (1966). The basic framework has been one which envisages the firm generating certain firm-specific assets in its home country, then seeking to exploit these further by creating income-generating assets abroad. Until relatively recently location or 'pull' factors were viewed as less important than 'push' factors, related to ownership advantages and the benefits of internalisation. Assumptions concerning the beneficial effects of FDI are essentially based on this model of 'superior' MNEs entering the domestic industry, and their advantages somehow being assimilated by the domestic sector. On a regional level, new foreign manufacturing investment can also have beneficial economic consequences, particularly within disadvantaged or peripheral areas. In addition to job creation and resource transfer, foreign inward investments can also provide technology and skills transfer to supplier and customer sectors.

Blomström and Kokko (1996) provide several reasons why technology is expected to transfer from MNEs to domestic firms, thus increasing the innovatory capacity of the host country. This can occur directly, through the licensing of a particular technology, through supplier networks or subcontracting arrangements, or indirectly as knowledge becomes public and spillovers are assimilated by the domestic sector. A further possibility, related to the transfer of ownership advantages, is the so-called 'demonstration effect'. This is outlined in Caves (1996), and includes phenomena such as local firms learning better management techniques, or developing coordination economies as a result of the foreign investment.

British national and regional policy makers have over and over again stressed the role of foreign investment to support the industrial development or regeneration of less favoured regions. Foreign investment is expected to tackle structural unemployment, to create or revitalise local industries and, more importantly, to generate positive externalities via a sort of multiplier effect, namely new firm formation. In the last decade in particular, competitiveness has been consistently associated with industrial agglomeration and the presence of clusters. An extensive academic literature on clusters has contributed to devise a sort of recipe book to produce competitive clusters. This has catalysed the attention of policy makers and practitioners on creating new clusters and supporting existing ones in a desperate need to play the global game.

The importance of spillovers from multinational enterprise was demonstrated by Barrell and Pain (1997), who attributed around 30 per cent of the productivity growth in UK manufacturing between 1985 and 1995 to the impact of inward investment. The most optimistic results concerning regional benefits are reported by Young et al. (1988), and Neven and Siotis (1993), possibly due to the regions on which research is concentrated. Such results, however, are in general based on studies that examine productivity growth in the aggregate, that is, including the simple 'batting average effect' that is likely to result from new entry, be it foreign or domestic. Nevertheless, studies have also shown that large inward investing groups can attract and promote the development of supplier clusters, and also play a role in the development of a region's social and physical infrastructure (Markusen and Venables, 1999). Equally, as Driffield and Munday (2000) show, inward investment can act to improve domestic performance, and improve revealed comparative advantage. Surveys of this literature are provided by Görg and Strobl (2001) and Görg and Greenaway (2002), and a discussion of many of the problems associated with this type of analysis is provided by Haskel et al. (2001). The latter report positive spillover effects from FDI, but with smaller magnitudes than are reported elsewhere.

More recently, however, the focus of the literature concerned with spillovers from FDI has turned to explaining such large differences in results. A large literature is developing, for example, which focuses on linkages between the foreign and domestic sectors, and in particular on the importance of formal linkages for spillovers and technology transfer. Driffield et al. (2004), for example, examine the extent to which foreign manufacturing firms in the UK promote productivity growth in the domestically owned manufacturing sector through their buying and supplying relationships. They illustrate the existence of intra- and interregional externalities from the presence of foreign manufacturing, and intra- and inter-industry effects. Externalities in the domestic sector are most noticeable where foreign manufacturing sells to domestic manufacturing. When one considers these findings within the debate concerning the importance of clusters, it is likely that FDI that is aligned with a pre-existing cluster will generate greater mutual benefits for both the cluster and the inward investors, compared with inward investment that occurs elsewhere. De Propris and Driffield (2005) discuss this issue in more detail, and the findings are discussed in depth below.

## 4. THE IMPORTANCE OF CLUSTERS AND AGGLOMERATION IN ATTRACTING FDI

Linking agglomeration to FDI in itself is not a new idea. Cantwell (1991), for example, shows that there are significant benefits to both domestic

and foreign firms from agglomeration (see also Shaver, 1998). Location advantages at the local or regional level could be self-perpetuating where further development of a local industry makes the location even more attractive (Head et al., 1995; see also Krugman, 1991; Wheeler and Mody, 1992). In a similar vein, Driffield and Munday (2001) illustrate the importance of agglomeration economies and spillovers on total factor productivity growth of UK regions. They demonstrate that a critical level of regional concentration of economic activities is a necessary condition for spillovers to occur. Much of the recent work on the determinants of the spatial distribution of FDI is based on Coughlin et al. (1991), who develop a model of MNE location choice based on profit maximisation. Coughlin et al. (1991) demonstrate that FDI is attracted to regions with high levels of final demand for the output, but also to regions with high densities of manufacturing activity and extensive transportation infrastructure. At the same time higher wages and taxes deter FDI location.

More recently, however, the focus has shifted from the extent to which multinationals' subsidiaries tend to agglomerate, or the extent to which inward investors encourage agglomeration of activity, to the attractiveness to inward investors of pre-existing agglomerations of domestic firms. Clearly in such cases the inter-firm dynamics are very different and it is to these phenomena that recent research has turned. Nachum (2000), for example, offers a link between models based on economic geography and international business analysis by suggesting that FDI can be a force for agglomeration, while this is tested more explicitly in Driffield and Munday (2000, 2001). Pantzalis (2001) demonstrates that the location of foreign subsidiaries can contribute significantly to the value of the parent company, while Zaheer and Manrakhan (2001) address this issue of agglomeration more explicitly. They illustrate the importance of regional concentration in explaining the location patterns of FDI, highlighting the importance of local production even in the presence of virtual links between markets. Perhaps more surprising is that similar forces can be identified in a developing-country context. Chew and Yeung (2001) and He (2003), for Singapore and China respectively, demonstrate the importance of the agglomeration of domestic activity in explaining inward investors' location decisions. Further, Chew and Yeung (2001) illustrate that through such clusters of local firms, a transfer of specific knowledge to the MNE can take place, improving its performance.

Following Dunning's (1998) contribution on the importance of location for international business research, there has been a significant growth in the literature seeking to explain the location of foreign subsidiaries. In particular, many seek to investigate the link between agglomeration and FDI. For example, Cantwell and Santangelo (1999) argue that the

technological strengths of host countries are important in determining the location options for the multinational firm. In addition, the localised nature of learning processes has changed the geographical scale of location patterns from the national to the regional or even local level. This is illustrated by Dicken (1998) and Cantwell and Iammarino (2002), for example, who show that foreign R&D activities in the UK are strongly concentrated in the south-east of England.

The issue of the specific nature of agglomeration forces is addressed by Guimarães et al. (2000), who distinguish between four different agglomeration effects, as well as urbanisation effects. First, they identify industry-specific localisation economies, proxied by the local share of employment by sector at the local level. This, however, does not allow for differences in the organisation of output in the sector, whether it is concentrated in one large firm or many smaller ones, for example. This distinction is vital when attempting to evaluate the importance of 'genuine' firm cluster or LPS effects. Second, they allow for a more general agglomeration effect captured through the concentration of business services at a local level. Third, they allow for the more specific agglomeration effects within the foreign sector separately. This borrows from the arguments made by Mariotti and Piscitello (1995), discussed below. Finally, they include a manufacturing intensity variable, proxied by manufacturing employment density. It is not clear *ex ante*, however, how this variable may be expected to affect the location decision of inward investors. It is possible, for example, that an already densely populated manufacturing sector would deter further entry rather than attract it. In general, however, Guimarães et al. (2000) find that general manufacturing agglomeration (manufacturing intensity), industry-specific agglomeration and the presence of service sector firms all attract FDI to particular locations in Portugal, while there is no significant additional foreign sector effect. These results are indicative of the fact that FDI in Portugal is strongly concentrated around Lisbon and Porto, with such urban concentrations perhaps dominating any other cluster or LPS effect.

List (2001) reports similar results for California, in that industry agglomeration, population density and land availability at a county level all act to attract FDI. List's measure of agglomeration, however, has a significant 'entry' component, such that it is highly correlated with foreign entry in previous time periods. Mariotti and Piscitello (1995) report similar results for Italy, based on the information requirements attached to entering a foreign country. This is well understood within the international business literature, but seldom addressed within empirical studies. Mariotti and Piscitello (1995) argue that such information problems lead to regional concentration of inward investors. Such a phenomenon has also been

suggested as part of the explanation for concentrations of Japanese investment in South Wales (Munday, 1990). It is reasonable to assume that cluster and LPS effects in the Italian case will reinforce this, providing evidence of successful sustained activity at the local level. Coughlin and Segev (2000) extend previous analysis by including educational attainment as a possible determinant of FDI attraction, and illustrate the importance of infrastructure and tax rates. They also demonstrate that urban regions are more attractive to FDI than rural ones. The literature seeking to examine a firm's decision to undertake FDI has recently begun to focus on the importance of agglomeration economies. Recent examples of work in this area include Basile's (2002, 2004) analysis of Italy; Crozet et al.'s (2004) of France; and Togo and Arikawa (2002) for Malaysia. Further, Devereux and Griffith's (1998) analysis of the UK illustrates the importance of agglomeration in explaining the location of inward investors. This work, however, ignores the more complex issues concerning the type of agglomeration, in terms of the importance of production systems and/or industrial districts.

## 5. FDI AND THE IMPORTANCE OF TECHNOLOGY SOURCING

Recent theoretical work represents an important step forward in this area, with Fosfuri and Motta (1999) and Siotis (1999) both presenting formal models of the FDI decision which embody the possibility of technology sourcing.[4] They show that a firm may choose to enter a market by FDI in order to access positive spillover effects arising from close location proximity to a technological leader in the host country. Because of the externalities associated with technology, these spillovers reduce the production costs of the investing firm both in its subsidiary operations and in its home production base. Siotis (1999) also shows that the presence of spillovers may induce firms to invest abroad even where exporting costs are zero. Driffield and Love (2003) find evidence to support the hypothesis of technology sourcing, but only under certain conditions: first (and most obviously) that the domestic sector concerned has some firm- or industry-specific knowledge, and second that this knowledge can be accessed and appropriated by the MNE.

It is clear, however, that the ability of a locality to attract FDI merely represents the potential for development, and that technology, or knowledge sourcing is by no means automatic, but depends on the actions of the firms concerned (Driffield and Love, 2003). This can be extended to the analysis of local industrial systems (LISs) as referred to by Bellandi (2001). In LISs, the

embodied knowledge is embedded not in an individual firm, but within the system of firms. In particular this 'systemic' knowledge is analysed by Henry and Pinch (Chapter 5) with regard to so-called 'architectural knowledge', and is also related to Bellandi's analysis of cluster-specific public goods (Chapter 4). Such locations are, therefore, attractive for knowledge-sourcing MNEs, providing that they are able to foster cooperative relationships with local firms. Kogut and Chang (1991) and Neven and Siotis (1996) point out that the possibility of technology sourcing has exercised the minds of policy makers in the USA and the EU, with concerns that host economies' technological bases may be undermined by technology sourcing by Japanese and US corporations respectively. The literature on the internationalisation of R&D also contains an increasing amount of evidence that technology sourcing may be a motive for FDI (Cantwell, 1995; Cantwell and Janne, 1999; Pearce, 1999). This literature stresses a range of reasons for FDI in R&D, much of which is concerned with the relative technological strengths of the capital-exporting (i.e. 'home') firm or country versus that of the host. For example, Kuemmerle (1999) distinguishes between 'home-base exploiting' (HBE) FDI and 'home-base augmenting' (HBA) FDI. The former is undertaken in order to exploit firm-specific advantages abroad, while the latter is FDI undertaken to access unique resources and capture externalities created locally. Van Pottelsberghe de la Potterie and Lichtenberg (2001) find positive spillovers effects from outward FDI arising from accessing the R&D capital stock of host countries, leading them to conclude that FDI flows are predominantly technology sourcing in nature. Le Bas and Sierra (2002) develop such arguments further and demonstrate that domestic clusters are important for technology sourcing FDI by MNEs, as do De Propris and Driffield (2005), who show that productivity spillovers in both directions between MNEs and domestic firms are significantly greater for clusters. This is discussed in more detail in the following section.

Based on the above discussion, it is important to focus not merely on the creation of clusters dependent on the large inward investment, but on a hitherto almost completely ignored question, that of the relationship between inward investors and pre-existing indigenous clusters. These localised centres of accumulated knowledge can be very attractive to outside firms. Further, the work that has been done in this area highlights the need for a more sensitive treatment of agglomeration economies, in terms of their importance for attracting FDI and fostering linkages. The very general classification of agglomeration economies so far adopted in FDI location choice models is likely to underestimate the specific role of LPSs and MIDs in explaining the location of inward investment. This is addressed in more detail in De Propris et al. (2005) in terms of highlighting the varying

importance of LPS effects, MID effects and more general urbanisation effects in attracting FDI.

# 6. MORE RECENT EVIDENCE

In this section, we present the findings of some recent work carried out on both the UK and Italy on the links between inward investment and cluster development. Essentially, this sets out to address two fundamental questions:

1. Are pre-existing clusters important for attracting inward investment?
2. Is the link between clusters and inward investors important in explaining the existence of spillovers from inward investment?

## 6.1 Pre-existing Clusters and Inward Investment Penetration at the Regional Level

This section examines the link between pre-existing cluster development and the attraction of inward investors. This extends the existing literature in this area to discussing the extent to which the specific nature of firm agglomeration is important in attracting FDI. Previous work in this area has, for example, employed some very basic measures of agglomeration, such as employment or population density, or urbanisation, rather than more specific measures of clustering, focusing on MID or LPS formation, for example. Such analysis can be considered to fit not only within the context of the importance of cluster development, discussed above, but also within the wider literature concerned with the importance of location in explaining inward investment penetration.

It is particularly of interest to consider the role of MIDs in attracting FDI in the case of Italy. MIDs in Italy have been extensively researched to understand their geographical distribution, their dynamics/functioning, and their evolution over the last 20 years. However, little has been written on the interaction between MIDs and foreign investment. As already mentioned, the literature on FDI location choice has recently started to look to the importance of agglomeration economies, but only in terms of the geographical proximity of production activities. Our study goes further and takes into account the wider literature on local industrial systems and more precisely on MIDs (De Propris et al., 2005).

Employing detailed data on local production systems, trade and FDI, De Propris et al. (2005) explore the conditions affecting the location choice of MNEs by considering LISs and MIDs as attractive locations for foreign

investment. The database combines information on foreign entry[5] with Census of Industry and Services statistics, both stratified by location and industry. The territorial units of analysis are 20 Italian standard regions which are disaggregated into 103 provinces. LISs and MIDs are defined at the provincial and industry level by means of combining two indicators: manufacturing density and industry specialisation. This generates a set of industry-specific dummy variables that vary across provinces and identify 311 LISs with respect to more than 2150 potential industry and province combinations. On the other hand, drawing on Becattini and Menghinello (1998), 40 distinct MIDs are identified.

The analysis demonstrates that LISs are important in explaining the variations in inward investment penetration across regions. Specifically, both LIS and MID locations are positively associated with foreign entry. These results were also considered within the context of alternative indicators of local industrial development, such as firm size and export performance. Not surprisingly, perhaps, the existence of large domestic firms in such locations deters foreign entry, while superior export-performing LISs appear to present additional chances to attract or keep FDI. These findings are consistent with the 'location advantages' approach to the location of activity, such that LISs generate certain competitive advantages that act as a catalyst to attract and maintain FDI. In high-technology industries, foreign firms will benefit from the externalities generated in specialised LISs through their engagement in formal and informal linkages with local high-tech firms or institutions. In other industries, foreign firms are very likely to benefit from location spillovers through learning-by-interacting processes, mainly realised via user–producer linkages with other local firms along the local production *filière*. The LIS effects are also relevant in low-technology sectors where knowledge sourcing from these LISs is viewed as very risky but also very profitable.

The suggested importance of agglomeration for attracting inward investment is highlighted further when one considers the different types of LISs. De Propris et al. (2005) illustrate that MIDs exert an additional influence in attracting FDI, over and above the more generic LIS effects. This suggests that the superior competitive advantages of MIDs are at least in part a result of the more efficient system of local governance that such clusters tend to foster. This finding is interesting from two points of view. One is that it shows that the location choice of MNEs can be driven by the competitive advantages, in terms of knowledge and specialisation, that certain localities are able to offer regardless of cheap labour or subsidies. It is worth reminding ourselves that the sources of such competitive advantages are location specific. Related to that, the other interesting point is that regions' competition/race to attract FDI can therefore be redefined so

that regions have greater bargaining power with foreign firms. Regions no longer have to sell themselves cheap by enticing MNEs with cheap land, tax breaks or subsidies, but they ought to be able to attract MNEs on the basis of mutual interest and compatibility. Embedded, immobile and intangible factors constitute a location-specific competitive advantage that gives localities the opportunity to enter a virtuous circle of growth with the MNE.

## 6.2 Clusters and Spillovers from FDI

The link between inward investors entering or linking to pre-existing clusters and the creation of (potentially mutually beneficial) spillovers has seldom been discussed, either in the international business or regional development literature. Further, the literature that does exist tends to focus on the importance of technology sourcing and the motivation for foreign entry, rather than seeking to quantify the potential benefits to either the cluster of the inward investors.

Addressing such crucial issues not only enables us to understand better the link between local development and foreign inward investment, but also to rethink the objectives and drivers of an FDI policy. Within a relatively standard framework, De Propris and Driffield (2005) compare spillovers between foreign and domestic firms in the UK in LPS and non-LPS cases, based on De Propris's (2005) map of clusters in the UK. The approach taken by De Propris and Driffield (2005) is novel for three reasons. First, it seeks to link the incidence of FDI within pre-existing clusters to its impact, and second it considers not only the spillover effects that flow from the foreign to the domestic sectors, but also those that flow in the opposite direction, based on the analysis of clusters discussed above. Third, these effects are considered within a simultaneous framework.

The first thing that one notices from these data is that productivity growth is significantly higher in clusters than elsewhere, this difference being particularly marked for the UK-owned firms. This suggests that in general the policy (however it is carried out) of seeking to foster cluster development within the UK is worthwhile. Equally, the importance of experience effects (or accumulated knowledge) in generating productivity growth is greater for clusters, the difference being the greatest when comparing inward investment inside and outside clusters. The marked difference between the LPS and non-LPS groups becomes apparent when one considers the spillover effects. Spillovers from FDI do exist, but are largely limited to those industry/region combinations that possess significant LPSs. Firms in LPSs gain significantly from local FDI, both within the industry of the domestic firm and across other industries in the region. In the non-LPS

case, however, there are no such spillovers, with domestic firms experiencing an adverse effect of FDI as they are forced to compete with newer, more efficient entrants.

Considering the inward investors as potential recipients of spillovers, appropriating gains as a result of investment by domestic firms, the pattern is very similar. Such spillovers are present in locations with clusters, and absent elsewhere. When one considers these results in conjunction with those concerned with the distribution of FDI, this provides clear evidence that not only are clusters an attractive location for inward investors, but that inward investors are successful in accessing the knowledge contained therein. Indeed, the results suggest that the key distinction to be made in determining the importance of external investment for generating spillovers is not between foreign and domestic firms, but between LPS and non-LPS. As well as having significant policy implications, this may also shed some light on why results regarding localities' productivity growth from inward investment are so varied.

## 7. FDI, CLUSTERS AND CURRENT POLICY

The literature discussed and the empirical evidence provided above suggests that UK policies concerned with fostering cluster formation are rather misguided. Regional policy and more recently cluster policy have had regional competitiveness as their main objective and clusters as the main instrument to deliver it; for instance almost all regional development agencies in England, Scotland and Wales mention clusters in their regional strategies. However, how can clusters be created or sustained? The answer is thought to be, among other things, inward investment.

However, case study analysis based on the UK has highlighted examples of the failure of a cluster policy based on the attraction of FDI. As already mentioned, FDI-generated clusters have often proven to be fragile and short-term: the MNE does not embed itself in the locality but uproots itself and relocates if economic conditions change; there is no or little technology transfer; and, finally, if there are spin-offs from the MNE these tend to be subcontractors for whom the MNE is the only buyer. The outcome is a monopsonistic cluster whose survival depends on the MNE only.

For example, in Sedgefield, it was found that 35 per cent of the borough employment depended on the presence of two large MNEs: Electrolux and Black & Decker; restructuring Electrolux cost the region 650 jobs (Pyke and Tomaney, 1999). Similarly, Bailey (2003) reports that the supply chain in the car component industry around BMW–Rover (MG–Rover now) accounted for up to 50 000 jobs in the West Midlands, so that the downsizing

or closure of the firm would have a major impact on the local economy. Finally, the closure of the Motorola mobile phone plant in West Lothian in Scotland in 2001 cost the region 3000 jobs. Turok (1993) has argued that the beneficial impact on the electronics industry due to the entry of MNEs is limited, while Siler et al. (2003) also find that MNEs in Scotland have not generated an automatic technology transfer. Extending this line of argument, Rugman and D'Cruz (2000) argue that MNEs have failed to develop high-value-added activities, rather an agglomeration of small firms based on low labour costs and incentives. In more general terms, they argue that US and Japanese MNEs have located in Scotland as a low-cost manufacturing base in view of supplying European markets. Indeed, these factors still appear to be the main attraction for inward investors in the UK. As a result, as the UK faces increased competition from lower-cost producers such as Taiwan and Singapore, the survival of the electronics cluster is in jeopardy.[6]

Rather than seeking to focus on inward investment as a catalyst for development, cluster policy should seek to focus on strengthening local competencies. As such this should then encourage the integration of inward investors within the local production system on the basis of the foreign firms' production complementarity and specialisation. In so doing, inward investment will become part of the system's collective learning process. The long-term positive impact of inward investment can be guaranteed by the presence of location-specific factors (against mobile factors) that provide the incentive for the MNE to commit itself to a particular locality. Typical location-specific factors are knowledge and information, in particular, tacit knowledge and uncodified knowledge that cannot be disseminated outside the cluster. Such knowledge and information constitute clusters' intangible assets and as such are immobile and embedded. The interest of an MNE to access these intangible assets would mean that it has to locate in a specific place and nowhere else. Location-specific intangible and immobile factors enable localities not to be easily replaceable and reduce the incentive of MNEs to be footloose.

## 8. CONCLUSIONS

British national and regional policy makers have consistently stressed the importance of foreign investment in stimulating industrial development and regeneration of less favoured regions. The UK Government *Competitiveness White Paper* (DTI, 1998), as well as the *White Paper on Enterprise, Skills and Innovation* (DTI, 2001) and the *Innovation Report* (DTI, 2003) discuss the

role of clusters for innovation, productivity and therefore competitiveness. These objectives are often pursued via the attraction of foreign investors.

Industrial performance and competitive advantages are important determinants of FDI into the UK. Further, the positive impact of inward investment on the UK is highlighted in terms of the impact on productivity in the UK-owned sector. Equally, competitive advantages at the industry level are related to technology spillovers, and the possible agglomeration economies from the clustering of similar manufacturing plants. There is every indication that regional agglomerations of foreign manufacturing capital can make regions more productive, and the challenge for the UK regions is to attract foreign manufacturing in sectors appropriate for the location.

This also indicates that it may be possible to target inward investment promotion activities to international sectors where there is a greater possibility of success. In order to maximise the benefits of inward investment, emphasis should be placed on seeking to attract inward investors whose activities are complementary with domestic activity. This implies that the cost-effective deployment of marketing resources should be focused upon localities where the UK possesses a relative competitive advantage.

Among the various motives for FDI, technology and knowledge sourcing is the one that seems to be associated with positive spillovers on the host economy. This prompts a rethink of the aims and objectives of both cluster policy and FDI policy. FDI-generated clusters are fragile and have often proven unable to provide the sustainable development of localities because multinational enterprises are intrinsically footloose. On the contrary, our findings seem to suggest that there is scope to reconsider the role of FDI for regional development especially if the impact of FDI is expected to be sustainable, rather than being a short-term job creation panacea.

Regional development cannot be pursued via a cluster policy which merely develops collections of small firms that become dependent on the inward investor. Rather, cluster policy should focus on the attraction of 'quality' FDI in conjunction with compatible domestic activity, with prospects for mutual benefits rather than a dependent relationship. To an extent, therefore, cluster policy needs to be pursued separately from policies merely designed to attract FDI. There are undeniable reasons why local or national agencies should wish to attract internationally mobile capital to disadvantaged regions, but this has to be seen as a separate policy from the fostering of clusters. Cluster policy crucially requires the supporting and development of local and embedded competencies. As centres of accumulated knowledge, these will then become attractive localities for MNEs. In this context, however, the MNEs are attracted not by cheap labour or investment incentives, but by location-specific production inputs. In other words, cluster policy has to set the scene for a strategic and selective

process of targeting and attracting FDI. It is in such situations that the benefits of inward investment to the host economy will be maximised.

## NOTES

* The authors gratefully acknowledge the financial support of the Nuffield Foundation for the funding of this research (grant number: SGS/00741/A). Thanks are also due to Jim Love, David Bailey and Roger Sugden as well as participants at the EUNIP 2003 International Conference for comments on earlier drafts of this chapter. All disclaimers apply.

1. The existence of a relationship between clusters and local competitiveness is reflected in some of the other contributions to this volume, and is analysed in particular depth in the chapter by Pitelis and Pseiridis (Chapter 2).
2. See, in particular, the chapter in this volume by Bellandi (Chapter 4) for more on the characteristics of MIDs, and the distinction between these and LPSs. The chapter by Aranguren et al. (Chapter 12) also provides an analysis of MIDs specific to the Basque region of Spain.
3. Related discussion on the governance structures of clusters can be found in the contributions to this volume by Sacchetti and Tomlinson (Chapter 11) and Sugden et al. (Chapter 3).
4. Fosfuri and Motta prefer the term 'technology acquisition'.
5. Data provided by CNEL–ICE – Politecnico di Milano.
6. The chapter in this volume by Sacchetti and Tomlinson (Chapter 11) addresses such issues in the specific contexts of challenges facing the North Staffordshire ceramics industry in the UK and the Prato textile district in Italy.

## REFERENCES

Bailey D. (2003), 'Globalisation, regions and cluster policies: the case of the Rover task force', *Policy Studies*, **24** (2/3), 67–86.

Barrell, R. and Pain, N. (1997), 'Foreign direct investment, technological change, and economic growth within Europe', *Economic Journal*, **107**, 1770–86.

Basile, R. (2002), 'The locational determinants of foreign-owned manufacturing plants in Italy: preliminary results', *Rivista di Politica economica*, **34** (1) July–August, 3–25.

Basile, R. (2004), 'Acquisition versus greenfield investment: the location of foreign manufacturers in Italy', *Regional Science and Urban Economics*, **34**, 3–25.

Becattini, G. (1979), 'Dal "Settore" Industriale Al "Distretto" Industriale. Alcune Considerazioni Sull'unità Di Indagine Dell'economia Industriale', *Rivista di Economia e Politica Industriale*, (1), 7–21.

Becattini, G. (1987), *Mercato e Forze Locali: Il Distretto Industriale*, Bologna: Il Mulino.

Becattini, G. (1990), 'The Marshallian industrial district as a socio-economic notion', in F. Pyke, G. Becattini, and W. Sengenberger (eds), *Industrial Districts and Inter-firm Co-operation in Italy*, Geneva: International Institute for Labour Studies, pp. 37–51.

Becattini, G. (2000), *Il Distretto Industriale*, Turin: Rosenburg and Sellier.

Becattini, G. (2004), *Industrial Districts. A New Approach to Industrial Change*, Cheltenham: Edward Elgar.

Becattini, G. and Menghinello, S. (1998), 'Il *Made in Italy* distrettuale', *Sviluppo Locale* **V** (9), Torino, Rosenberg & Sellier.

Bellandi, M. (2001), 'Local development and embedded large firms', *Entrepreneurship & Regional Development,* **13** (3), 189–210.

Belussi, F. and Arcangeli, F. (1998), 'A typology of networks: flexible and evolutionary firms', *Research Policy*, **27**, 415–28.

Bjorn, A. and Isaksen, A. (1997), 'Location, agglomeration and innovation: towards regional innovation systems in Norway', *European Planning Studies*, **5** (3), 299–331.

Blomström, M. and Kokko, A. (1996), 'Multinational corporations and spillovers.' CEPR discussion paper no. 1365.

Blomström M., Kokku A. and Globerman, S. (2001), 'The determinants of host country spillovers from FDI: A review and synthesis of the literature', in N. Pain (ed.), *Inward Investment, Technological Change and Growth*, Basingstoke: Palgrave.

Buckley, P.J. and Casson, M.C. (1976), *The Future of the Multinational Enterprise.* London: Macmillan.

Cantwell, J.A. (1991), 'The international agglomeration of R&D', in M.C. Casson (ed.), *Global Research Strategy and International Competitiveness*, Oxford: Blackwell.

Cantwell, J. (1995), 'The globalization of technology: what remains of the product life cycle model?' *Cambridge Journal of Economics*, **19**, 155–74.

Cantwell, J. and Iammarino, S. (2002), 'The technological relationships between indigenous firms and foreign-owned MNCs in the European regions', in P. McCann (ed.), *Industrial Location Economics*, Cheltenham: Edward Elgar.

Cantwell, J. and Santangelo, G.D. (1999), 'The frontier of international technology networks: sourcing abroad the most highly tacit capabilities', *Information Economics and Policy*, **11** (1), 101–23.

Caves, R.E. (1996), *Multinational Enterprise and Economic Analysis*, Cambridge: Cambridge University Press.

Chew, Y.T. and Yeung, H.W.C. (2001), 'The SME advantage: adding local touch to foreign transnational corporations in Singapore', *Regional Studies*, **35** (5), 431–48.

Cossentino, F. et al. (1996), *Local and Regional Responses to Global Pressure: The Case of Italy and its Industrial Districts*, Geneva: International Institute for Labour Studies.

Coughlin, C.C. and Segev, E. (2000), 'Location determinants of new foreign-owned manufacturing plants', *Journal of Regional Science*, **40** (2), 323–51.

Coughlin, C.C., Terza, J. and Arromdee, V. (1991), 'State characteristics and the location of foreign direct investment within the United States', *Review of Economics and Statistics*, **73** (4), 675–83.

Crozet, M., T. Mayer and J. Mucchielli (2004), 'How do firms agglomerate? A study of FDI in France', *Regional Science and Urban Economics*, **34**, 27–54.

De Propris, L. (2001), 'Systemic flexibility, production fragmentation and cluster governance', *European Planning Studies*, **9** (6), 739–53.

De Propris, L. (2005), 'Mapping local production systems in the UK: methodology and application', *Regional Studies*, **39** (1), 197–212.

De Propris, L. and N. Driffield (2005), 'The importance of cluster for spillover from FDI and technology sourcing', *Cambridge Journal of Economics*, **29** (6).

De Propris, L., Driffield, N. and Menghinello, S. (2003), 'Localised Competitive Advantages and Local Industrial Systems in Italy', Working Paper No. 29, Birmingham Business School Series, University of Birmingham, UK.

De Propris, L., Driffield, N. and Menghinello, S. (2005), 'Local industrial systems and the location of FDI in Italy', *International Journal of the Economics of Business*, **12** (1), 105–21.

Department of Trade and Industry (1998), *Competitiveness White Paper*, London: HMSO.

Department of Trade and Industry (2001), *White Paper on Enterprise, Skills and Innovation*, London: HMSO.

Department of Trade and Industry (2003), *Innovation Report. Competing in the Global Economy: The Innovation Challenge,* London: HMSO.

Devereux, M. and Griffith, R. (1998), 'Taxes and the location of production: evidence from a panel of US multinationals', *Journal of Public Economics*, **68**, 335–67.

Dicken, P. (1998), *Global Shifts: Transforming the World Economy*, London: Paul Chapman.

Driffield, N.L. (2004), 'Regional policy and spillovers from FDI in the UK', *Annals of Regional Science*, **38** (4), 579–94.

Driffield, N.L. and Love, J.H. (2002), 'Does the motivation for foreign direct investment affect productivity spillovers to the domestic sector?', available at: http://research.abs.aston.ac.uk/working_papers/0201.pdf

Driffield, N.L. and Munday, M.C. (2000), 'Industrial performance, agglomeration, and foreign manufacturing investment in the UK', *Journal of International Business Studies*, **31** (1), 21–37.

Driffield, N.L. and Munday, M.C. (2001), 'Technical efficiency in UK industries: a stochastic production frontier approach', *Regional Studies*, **35** (5), 431–48.

Driffield, N.L., Munday, M. and Roberts, A. (2004), 'Inward investment, transactions linkages and productivity spillovers', *Papers in Regional Science*, **83** (4), 699–722.

Dunning, J.H. (1958), *American Investment in British Manufacturing Industry*, London: Allen & Unwin.

Dunning, John H. (1993), *Multinational Enterprises and the Global Economy*. Reading: Addison Wesley.

Dunning, J.H. (1998), 'Location and the multinational enterprise: a neglected factor?', *Journal of International Business Studies*, **29** (1), 45–66.

Fosfuri, A. and Motta, M. (1999), 'Multinationals without advantages', *Scandinavian Journal of Economics*, **101**, 617–30.

Gordon, I. and McCann, P. (2000), Industrial clusters: complexes, agglomeration and/or social networks?', *Urban Studies*, **37** (3), 513–32.

Görg, H. and Greenaway, D. (2002), 'Much ado about nothing? Do domestic firms really benefit from foreign investment?', CEPR Discussion Paper, no. 3485.

Görg, H. and Strobl, E. (2001), 'Multinational companies and productivity spillovers: a meta-analysis', *Economic Journal,* **111F**, 723–39.

Görg, H. and Strobl, E. (2003), 'Footloose multinationals?', *The Manchester School*, **71** (1), 1–19.

Guerrieri, P. et al. (2001), *The Global Change and Industrial Districts*, Cheltenham: Edward Elgar.

Guimarães, P., Figueiredo, O. and Woodward, D. (2000), 'Agglomeration and the location of foreign direct investment in Portugal', *Journal of Urban Economics*, **47** (1), 115–35.

Haskel, J., Pereira, S. and Slaughter, M. (2001), 'Does inward FDI boost the productivity of domestic firms?' NBER Working Paper 8724.

He, C. (2003), 'Location of foreign manufacturers in China: agglomeration economies and country of origin effects', *Papers in Regional Science*, **82** (3), 351–72.

Head, K., Ries, J. and Swenson, D. (1995), 'Agglomeration benefits and location choice: evidence from Japanese manufacturing investments in the United States', *Journal of International Economics*, **38**, 223–47.

Hymer, S. (1975), The multinational corporation and the law of uneven development', IN Hugo Radice (ed.), *International Firms and Modern Imperialism*. Harmondsworth: Penguin.

Kogut, B. and Chang, S.J. (1991), 'Technological capabilities and Japanese foreign direct investment in the United States', *Review of Economics and Statistics*, **73**, 401–13.

Krugman, P. (1991), 'Increasing returns and economic geography', *Journal of Political Economy*, **99** (3), 483–99.

Kuemmerle, W. (1999), 'Foreign direct investment in industrial research in the pharmaceuticals and electronics industries – results of a survey of multinational firms', *Research Policy*, **28**, 179–93.

Le Bas, C. and Sierra, C. (2002), 'Location versus home country advantages in R&D activities: some further results on multinationals' locational strategies', *Research Policy*, **31**, 589–609.

Leonardi, R. and Nanetti, R. (1994), *Regional Development in a Modern European Economy: The Case of Tuscany*, London: Pinter.

List, J. (2001), 'US county-level determinants of inbound FDI: evidence from a two-step modified count data model', *International Journal of Industrial Organization*, **19**, 953–73.

Longhi, C. (1999), 'Networks, collective learning and technology development in innovative high technology regions: the case of Sophia Antipolis', *Regional Studies*, **33** (4), 333–42.

Mariotti, S. and Piscitello, L. (1995), 'Information costs and location of FDIs within the host country: empirical evidence from Italy', *Journal of International Business Studies*, **26**, 815–41.

Markusen, A. (1996), 'Sticky places in slippery space: a typology of industrial districts', *Economic Geography*, **72** (3), 293–313.

Markusen, J. and Venables, A. (1999), 'Foreign direct investment as a catalyst for industrial development', *European Economic Review*, **43**, 335–56.

Martin, R. and Sunley, P. (2003), 'Deconstructing clusters: chaotic concept or policy panacea?', *Journal of Economic Geography*, **3**, 5–35.

McAleese, D. and Counahan, M. (1979), '"Stickers" or "Snatchers"? Employment in multinational corporations during the recession', *Oxford Bulletin of Economics and Statistics*, **41**, 345–58.

Morgan, K. (1997), 'The learning region: institutions, innovation and regional renewal', *Regional Studies*, **31** (5), 491–503.

Munday, M. (1990), *Japanese Manufacturing Investment In Wales*, Cardiff: University of Wales Press.

Nachum, L. (2000), 'Economic geography and the location of TNCs: financial and professional service FDI into the USA', *Journal of International Business Studies*, **32** (3), 367–85.

Nalebuff, B. (1996), *Co-opetition*, London: HarperCollins Business.

Neven, D. and Siotis, G. (1993), 'Foreign direct investment in the European Community – some policy issues', *Oxford Review of Economic Policy*, **9** (2), 72–93.

Neven, D. and Siotis, G. (1996), 'Technology sourcing and FDI in the EC: an empirical evaluation', *International Journal of Industrial Organization*, **14**, 543–60.

Pantzalis, C. (2001), 'Does location matter? An empirical analysis of the geographic scope and MNC market valuation', *Journal of International Business Studies*, **32** (1), 133–55.

Pearce, R.D. (1999), 'Decentralised R&D and strategic competitiveness: globalised approaches to generation and use of technology in multinational enterprises (MNEs)', *Research Policy*, **28**, 157–78.

Phelps, N.A. (1993), 'Branch plants and the evolving spatial division of labour: a study of material linkage in the Northern region of England', *Regional Studies*, **27**, 87–101.

Porter, M.E. (1996), 'Competitive advantage, agglomeration economies and regional policy', *International Regional Science Review*, **19** (1), 85–90.

Porter M.P. (1998) Clusters and the new economics competition, *Harvard Business Review*, November–December, 77–90.

Porter, M.P. (2000), 'Location, competition and economic development: local clusters in a global economy', *Economic Development Quarterly*, **14 (**1), 15–24.

Pyke, A. and Tomaney, J. (1999), 'Industrial regions? Trans-national corporations and economic development in Sedgefield borough', *European Planning Studies*, **7** (4), 407–29.

Pyke, F., Becattini, G. and Sengenberger, W. (1990), *Industrial Districts and Inter-firm Cooperation in Italy*, Geneva: International Institute for Labour Studies.

Rabellotti, R. (1997), *External Economies and Cooperation in Industrial Districts*, Basingstoke: Macmillan.

Rugman, A.M. and D'Cruz, J.R. (2000). *Multinationals as Flagship Firms: Regional Business Networks*, New York: Oxford University Press.

Shaver, Myles J. (1998), 'Do foreign owned and US owned establishments exhibit the same location pattern in US manufacturing industries?', *Journal of International Business Studies*, **29** (3), 469–92.

Shirlow, P. (1995), 'Transnational corporations in the Republic of Ireland and the illusion of economic well-being', *Regional Studies*, **29**, 687–705.

Siler, P., Wang, C.Q. and Liu, X.M. (2003), 'Technology transfer within multinational firms and its impact on the productivity of Scottish subsidiaries', *Regional Studies*, **37** (1), 15–25.

Storper, M. (1995), 'The resurgence of regional economies, ten years later', *European Urban and Regional Studies*, **2**, 191–221.

Simmie, J. and Sennett, J. (1999), 'Innovative clusters: global or local linkages?', *National Institute Economic Review*, **170**, 87–98.

Siotis, G. (1999), 'Foreign direct investment strategies and firms' capabilities', *Journal of Economics and Management Strategy*, **8**, 251–70.

Taylor, J. and Wren, C. (1997) 'UK regional policy, an evaluation', *Regional Studies*, **31** (9), 835–48.

Togo, K. and Arikawa, Y. (2002), 'Agglomeration effects versus policy effects: the case of the electronics industry in Malaysia', *Asian Economic Journal*, **16** (3), 229–45.

Turok, I. (1993), 'Inward investment and local linkages: how deeply embedded in silicon glen?', *Regional Studies*, **27** (5), 401–17.

Turok, I. (1997), 'Linkages in the Scottish electronics industry: Further evidence', *Regional Studies*, **31**, 705–11.

Van Pottelsberghe de la Potterie, B. and Lichtenberg, F. (2001), 'Does foreign direct investment transfer technology across borders?', *Review of Economics & Statistics*, **83** (3), 490–97.

Vernon, R. (1966), 'International investment and international trade in the product cycle', *Quarterly Journal of Economics*, **80**, 190–207.

Wheeler, D. and Mody, A. (1992) 'International investment location decisions: the case of US firms', *Journal of International Economics*, **33** (1–2) 57–76.

Young, S., Hood, N., and Dunlop, S. (1988), 'Global strategies, multinational subsidiary roles and economic impact in Scotland', *Regional Studies*, **22**, 487–97.

Zaheer, S. and Manrakhan, S. (2001), 'Concentration and dispersion in global industries: remote electronic access and the location of economic activities', *Journal of International Business Studies*, **32** (4), 667–86.

# 7. The institutional dynamics at work in territories: between local governance and global regulation

**Jean-Pierre Gilly and Jacques Perrat**

## INTRODUCTION

In a similar vein to earlier chapters, this chapter addresses conceptual approaches to the issue of local development, the territorial scale into which 'clusters' are most commonly seen to exist. Its perspective is not an endogenous one, in the strictest sense of this term. Quite the contrary: in our conception, territories, and the agents within them, are highly exposed to their (national and/or international) economic and institutional environments.

This explains our purpose, which is to reflect upon and elucidate the economic and institutional interconnections between territorial and global dynamics, specifically the links between the different spatial scales at which economic systems are regulated. After all, understanding such institutional mechanisms is crucial to our ability to analyse both local dynamics and the impacts of recent changes partly associated with so-called globalisation. In turn, these have potentially important implications for the role and impacts of clusters of firms, which by their nature operate within and yet act across distinct territories.

The first section introduces the analytical bases of our approach:

- territory is conceived of here in proximity terms, and as part of a dynamic vision. In other words, it is defined as a socio-economic construct produced by interactions between economic, technical, social and institutional local actors who are helping to solve a productive problem, or who are carrying out a joint development project. More specifically, a territory is characterised by its local governance. This is defined as the institutional processes that help regulate a territory's economic system at a local level, processes being taken as a whole;

- the forms assumed by the links between local governance and global regulation are manifested through the roles that the key actors fulfil. This is because local governance is never a mere transposition, on a reduced territorial scale, of a global regulation. It is the dynamic outcome of the tension between the vertical (sectorial or macro-institutional) and horizontal patterns that characterise a given territory.

The second section then tries to ascertain how this interrelationship between local governance and global regulation functions nowadays, in an era marked by changes in the exercise or transmission of power and/or authority. The issues at stake in these reshufflings can be broken down into three main questions, related to:

- the transformations of states;
- the broadening of firms' externalisation strategies;
- the new functioning modes of labour relations.

# 1. TERRITORIAL DYNAMICS, LOCAL GOVERNANCE AND GLOBAL REGULATION: METHODOLOGICAL PRECISION

## 1.1 The Concept of Territory: Proximities and Governance

Following previous work by the 'proximity school' (Gilly and Torre, 2000), we define territory as resulting from a combination of the three dimensions of proximity: geographic, organisational and institutional.

Geographic proximity refers to the way in which actors and activities are separated in space. Functionally expressed in cost and/or time terms, clearly this depends on transportation infrastructure and on communications technology. Organisational proximity refers to the interactions between actors who will be bringing complementary assets to the table when participating in a given finalised activity, be it inside the same organisation (i.e. a large group, a network, etc.) or between different ones, such as in a cluster of firms. Organisational proximity is grounded on institutional proximity, which stems from actors' adherence to rules of action and, in certain contexts, from their sharing of the system of representations that serves to orient collective behaviour.

In any event, institutional proximity is part of a contradictory power relationship, be it between employers and staff (as in a capital–labour

relation), between different firms (competition versus cooperation), or between private and public actors (profit logic versus common good logic). Hence the coherence it enables is always provisional in nature.

With the wide variety of local institutional and organisational contexts, three diametrically opposed categories of more or less territorialised productive organisations can then be highlighted:

1. *The agglomeration process* is based on a spatial concentration of heterogeneous economic activities that *a priori* lack complementarities. This concentration results from (and creates) external economies for companies, mainly in the form of 'pecuniary externalities' caused by a concentration of activities and actors. In price terms, these will have a direct knock-on effect on production inputs. The particularity of the agglomeration process, which is mainly characterised by geographic proximity, is its production of external effects that respond neither to industrial logic nor to systemic dynamics.
2. *The specialisation process* stems from the strong organisational structuring (i.e. between large transaction principals and subcontractors) of a local economic fabric dominated by one industrial activity or product. The process structuring this economic fabric is based on an industrial logic that lends itself to a geographic concentration of complementary activities. As such, it encompasses geographical and organisational proximities that do not require any great institutional proximity.
3. *The specification process* is typical of a territory that, thanks to the very close institutional proximity between its actors, offers economic agents coordination modes enabling a flexible deployment of resources, activities and competencies (in addition to organisational proximity effects), without tearing the territorial context apart. This process functions differently from the agglomeration and specialisation processes and is mainly based on the capacity for collective learning wherein strategies to reorient the territory's economic destiny along new developmental trajectories can be implemented by organising a flexible (re)combination of resources and assets.

These three categories of territory demonstrate the increasingly dense overlapping of the three forms of proximity, which range from agglomeration to specification via specialisation. To analyse these three forms and the types of coordination they encompass (market, non-market, or mixed), we still have to broaden the concept of institutional proximity by connecting it to that of local governance.

'Local governance' will be defined as a process used to create compatibility when a number of institutional proximities bring geographically proximate

(economic, institutional, social, etc.) actors together in order to solve a productive problem or carry out a local development project.[1]

Basically, this kind of definition stresses the idea of a process, that is, that of collective institutional dynamics interlinking (always singularly) the divergent logics of actors vying and/or cooperating with one another in a given territory. The process is not necessarily a virtuous one, as some institutional deconstruction processes (e.g. territorial reconversions) correspond to situations of 'weak' governance.

Local governance materialises through the development of local compromises between (private and public) actors. It is characterised by the extent of interlinkage and cohesion between the various institutional proximities that make up a territory, whether the labour relation, the confrontation between individual capital holdings, or the relationships between private and public actors.

As a result, local governance always combines elements of stability and instability whose relative importance will vary over time, thus defining shifts in the territory's developmental trajectory. However, to be able to talk about local governance, elements of stability will have to predominate, meaning that the inter-actor compromises have to be sufficiently stable and coherent to eliminate, at least for the time being, the uncertainty that is inherent to collective action, thus alleviating rivalries and conflicts. This is a prerequisite for setting up a system of social interdependencies, and indeed even a system of rules (the shared representations generating the localised productive patterns people call governance structures). Inversely, where elements of instability (i.e. rivalries and conflicts) undermine earlier compromises, what we have is a new era marked by a crisis of local governance. This can lead to a destructuring of the territory.

Among all the actors taking part in territorial dynamics, key private and/or public actors are catalysts inasmuch as they constitute institutional yardsticks for all the other actors (whose coordination mechanisms they structure). In this conception, key actors are those that help local governance to emerge and stabilise. They come indifferently out of the economic (corporate entities, associations of companies, etc.), institutional (regional authorities, the state, chambers of commerce, etc.) or social (labour unions, associations, etc.) spheres. What this means is that governance is not a configuration of strictly economic or socio-political types of coordination. Instead, it is a combination of these dimensions, characterised by the variable density of the interactions between all three categories of actors.

These interactions are particularly complex, notably due to the fact that the areas where local authorities intervene administratively do not coincide with the ones where economic and social actors operate. In addition, strategic temporal horizons or timeframes can differ greatly between public

and private actors. These differences generate a territorial commitment that can vary widely from one actor to the next. For example, institutional actors often play a key role in building up local governance, specifically through the formal institutions in charge of coordinating and networking (e.g. the '*contrats de pays*' system in France).[2]

We can distinguish between three main local governance structures by the nature of their key actors, objectives and ways of appropriating locally produced resources:

1. *Private governance*: private actors galvanise and orient resource coordination and creation mechanisms so as to achieve their goals of private appropriation. This is how it works with catalyst firms, for example, through the establishment of a large group that will try to structure the productive space of its facilities' site along economic and institutional lines.
2. *Collective private governance*: here the key actor is a formal institution uniting private operators and driving strategy coordination. Examples include chambers of commerce, professional associations and all forms of private operator clubs.
3. *Public governance*: public institutions have resource management modes that differ from private appropriation, notably through their production of goods or services that are collective in nature and which can therefore by definition be used by all actors without any competition or exclusivity (see Bellandi in Chapter 4 of this volume for more detail on different forms of public goods). This begins with the state and moves on to include local authorities and all their collective forms (intercommunality), as well as public research centres and so on.

In reality there are few 'pure' situations such as the aforementioned cases. What is usually found is an association of such forms (here we would talk about 'mixed governance'), with one being dominant.[3] This means that we can characterise each territory as if it were a particular case in a general category that can be more or less public or private in nature, depending on elements that are both specific and variable.

Like any topology, this one is static and based on stabilised structures of governance. In actual fact, what we should primarily retain from our definition is the idea that local governance is a process that imbues a territory with its fundamental dynamic dimension. This is because the compromises that stabilise inter-actor coordination are not set once and for all, and because we always end up with contradiction/conflict whenever actors can no longer solve a given productive problem collectively.

## 1.2 Local Governance and Global Regulation

Our conception of local governance is based on an open and non-'localist' vision of territory. As a matter of fact, actors (and notably key actors) located in a space develop interactions on both a local and global scale. This means that the level (the 'register') at which their actions are carried out transcends their localisation and causes them to be present both 'here and elsewhere' (Rallet, 2003). This is particularly true with actors such as major business group entities and decentralised state administrations, all of whom can be key actors in territorial dynamics.

Indeed, such actors simultaneously develop localised as well as 'remote' institutional proximities with 'external' actors who operate on a global stage. By so doing, they help to create a link between local governance and global patterns, thus reinforcing the idea of an interconnection of the different spatial scales of regulation. This makes local governance more dynamic, not only because of the interactions between these localised compromises and balances of power, but also due to the tension between the more sectorial and macro-institutional types of 'vertical' patterns and the 'horizontal' ones that characterise a given local economic space. The duality of the conventions governing the branch of a company's labour relations on one hand, and the employment relationship in a local job market on the other, constitute an essential modality of this tension.

In its institutional dimension, the nature of the relationship between the local and the global is therefore based both on the extent to which the macroeconomic regulation modes are stable,[4] and also on the ability to resist or innovate, which is related in turn to the mode of local governance. Between these two levels, there is no determinism of one or the other. Instead there is a reciprocal influence that is variable in space and time. In this respect, we should distinguish between a couple of situations:

- one in which we might observe a correspondence between local institutional patterns and global patterns in the mode of regulation; and between the local economic dynamics and the accumulation regime dynamics. The two levels of regulation are mutually reinforcing, and in this kind of situation local actors adopt routine-centred behaviours, since this is in their interest;
- another in which we might observe a de-phasing and even a disjunction between local governance and the mode of global regulation. Here local actors are encouraged to adopt innovative behaviours that can lead to two further different situations, depending on whether local crises can be resolved within the framework of existing local governance mechanisms. When the crisis is long-lasting, the issue becomes whether

the local transformations are bearers of new principles of productive organisation; and whether they convey the kinds of institutional mechanisms that are apt to disseminate throughout the economic system, thereby generating a new mode of development.

This institutional dialectic between the local and the global involves building 'vertical' compromises between actors. For example, compromises can be reached between the local policy of one of a multinational group's entities and its overall strategy; between the local actions of a state's county-level economic development units and its global policies; between one firm and the other actors in a network or cluster of industrial cooperation; between a local employment relationship and a branch-wide collective agreement and so on.

We can summarise our approach as in Figure 7.1. This diagram includes the idea of a twofold register where the key actors present in a territory can carry out their actions. This level is usually local and global at the same time. This is because key actors, in so far as they constitute institutional yardsticks for all the actors present in a given territory, are the only ones capable of creating the social mediations that will smooth out or else heighten the tensions that can exist between local governance and global regulation. These local/global relationships should therefore be viewed dynamically, from a perspective based on a dynamic articulation of these two levels of regulation, and comprising periods when the institutional proximities that

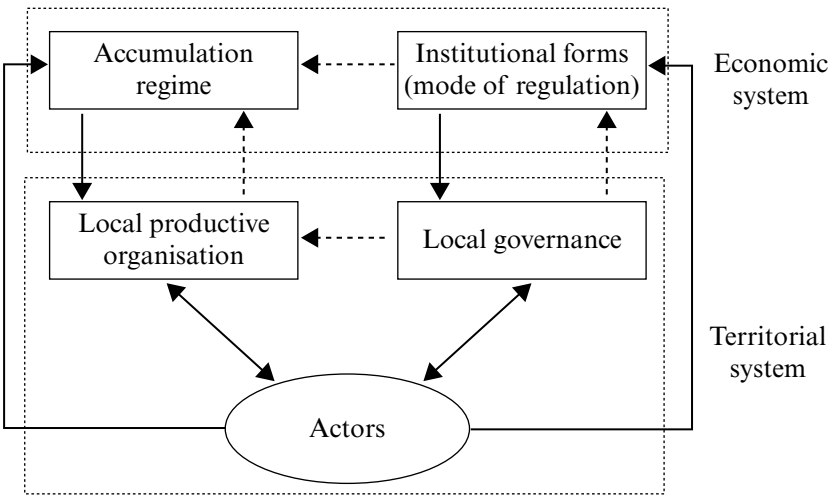



*Figure 7.1 Local governance and global regulation*

key actors have agreed with local or extra-local actors will either be adjusted to or else de-phased from one another.

We have previously described this process (Gilly and Wallet, 2001) as a hybridisation that will be either essentially organisational, whenever stability reigns (involving an adaptation of local rules within a framework of global economic and institutional principles), or mainly institutional during times of change (whenever the prevailing local governance can no longer sustain the territory's dynamics). In this case the rules and local compromises need to be transformed. This is the situation in which we find ourselves at present, and it will be analysed in the section below.

## 2. CONTEMPORARY INSTITUTIONAL TRANSFORMATIONS: BETWEEN THE LOCAL AND THE GLOBAL

In recent years, a number of questions have been raised about the spatial scales around which public and private sector actors traditionally used to coordinate their actions during the Fordist era. For the moment at least, the worldwide constructs remain partial and precarious (with the exception of those relating to financial globalisation). At the same time, the national level has ostensibly been weakened by the rising power of the 'intermediate' level (i.e. Europe, in our part of the world) and the 'local' one (which has tended to consolidate steadily, in France for example, with the institutional reinforcement of the role of regions, and with the enhancement of intercommunality and '*pays*').[5] This kind of process also affects firms' strategies, notably regarding major industrial groups decentralising their activities in space so as to be able to take advantage of the proximity effects that territorial dynamics create.

These transformations have not stabilised yet, and questions remain as to what extent their effects in regulation terms will be transitory or permanent. As such, the change in scale also translates into a change in the nature and management of the coordinations involved, the problem being to ascertain all the implications thereof in terms of the interlinkages that exist between local governance and global regulation. Clearly these are issues that have a strong bearing on the ways in which clusters of firms are able to operate in local systems that are themselves embedded in a global economy.

### 2.1 The State's Transformation and the Rising Power of Territorial Institutions

The territorialisation of state interventions that started in France around 20 years ago is part of a process that organises 'the shift from a substantialist

definition of general interest as conveyed by the State to a mainly procedural conception, meaning that the common good is built collectively, the risk being a relative dilution of responsibilities' (Azema and Parthenay, 2001).

Henceforth the state no longer appears to be the sole bearer of the general interest. Other actors, from both the private and the public sectors, have become more autonomous and are now helping to develop and negotiate rules and the applications thereof. It may be true that substantial logic has forced a certain number of rights and guarantees upon local agreements at the macro-social level, by enabling improvements that 'descend' from one level to the next. But, by the same token, procedural logic may be seen as involving no more than merely rubber-stamping 'binding' agreements, taken close to the point of impact, that is, perfunctorily accepting the institutionalisation of very general guarantees provided at the most global levels. We should keep this in mind when analysing the current success of the 'best practice' concept. Coming directly out of a corporate context, this idea has tended to become an overriding factor in the development of rules to govern relationships between social partners, between the various actors involved in a territorial project, between territories, between countries and so on. Furthermore, European institutions have explicitly retained this concept as the prime logic underlying their establishment of a normative system that is based on the notion of subsidiarity.

However, the 'ascending' logic used when linking levels of rules to one another must also be connected to a 'descending' logic, one that obliges the actors at a given decisional level to comply with both institutional orientation criteria and functional norms that have been set by actors operating at another level. This logic, which permeates the decision chain driving Europe, states, regions, '*pays*' and cities, should be comprehended in all of its dimensions. It could turn out to be an efficient vehicle for disseminating innovative norms at the environmental, social and societal levels. But it can also reinforce the tendency of local decisions to manifest themselves mainly in their technical forms, with their more political aspects being pushed back to other levels. This can lead to a transposition to the territorial level of a corporate mode of coordination, where discussions/negotiations are increasingly carried out under the constraint of the obligation to comply with norms (quality, delays, costs, etc.) that have been decided in other locations (Ughetto, 2001).

As such, albeit little by little and in a non-linear and contradictory fashion, what we are witnessing is a transformation of the previously prevalent situation, wherein the state certified and guaranteed the application (if not the establishment) of all the rules via their hierarchic diffusion towards infra-national levels. The rise of the subsidiarity principle and its contractual implementation has led to the emergence of new local configurations

wherein the state and local public actors tend to be situated at the same level, each being (or tending to be) the master of its own area of regulatory competency (Perrat, 2002).

In this sort of situation – at the intersection of the descending and ascending logics – what we find are tensions between actors whose scope of action can be national (the state) and/or European (EU) and others whose prerogatives are regional and local (territorial authorities, chambers of commerce, etc.). These tensions are factors of territorial dynamics, as are the appropriation of competency and legitimacy conflicts that break out between institutional actors engaging locally so as to solve a specific problem.

## 2.2 The Broadening of Firms' Spatial Externalisation Strategies

Large firms have been developing the practice of outsourcing, the nature of which has changed in recent times. This no longer involves simply asking a subcontractor to carry out a trivial kind of production, but instead asking it to assume real responsibilities in terms not only of quality, delays and costs, but also technological and organisational innovations. It is this new reciprocal positioning that is characterised by the concept of 'externality relationship' (Perrat, 1997). To a large extent, this concept covers firms' need to establish technological, organisational and institutional continuities with outside actors (to ensure their techno-productive efficiency and profitability), integrating them into the said firms' decisions and objectives while allowing them to 'be true to themselves', in other words to continue to 'function' and pursue their own aims.

The notion of outsourcing thus characterises a new type of relationship between the firm and all of the resources it intends to mobilise and/or develop, especially at the territorial level. At the same time, it also characterises a way of exercising power and/or authority, one that enables firms (notably when they are the key actors in a territory) to sustain objectives that will relate to the interests they are defending. The consequences are anything but unilateral, as the externality relationship actually combines subordination and autonomy and can (for certain actors) generate more room to manoeuvre than a purely hierarchical or commercial relationship can.

In several earlier studies we showed how large firms have increasingly tended to replace a spatial strategy based on the predation of local generic resources with another one that is geared towards the territorial development of specific resources, implying a narrow and lasting cooperation with a whole set of local actors (SMEs, service companies, research centres, public or local para-public institutions, etc.).[6] The end effect of this latter strategy

is to embed a group's establishment in a territory, at least for as long as its technological needs have not been met.[7]

A whole array of company positions can be defined in this manner, ranging from simple 'localisation' (warehouse, mine, the search for tax exemptions, a selective internalisation of the production factors that can be found in a given territory) to 'territorial embeddedness', an idea that expresses a deep involvement in the co-building of external resources that are to be mobilised on site, with a significant boomerang effect for the territory in question. In essence, this is how the forms of a reciprocal endogenisation of externalities can be deployed between a firm and a territory. An intermediate position can also exist, where the firm combines the resources available in a territory with its own internal resources, the logic being to ensure consolidation of the latter. This approach helps us to identify the different 'trajectories' that firms can follow as regards their relationship to the territory in question, since for any given firm the three positions defined above are far from mutually exclusive, and, above all, since the said trajectories are not necessarily linear. After all, firms can 'advance' or 'retreat', shifting by means of a number of successive repositionings.

## 2.3 New Modalities for Managing the Local Employment Relationship

The labour relationship, as defined in regulation theory, engenders the national rule system within which the localised work relationship is concretised. Over the past few years, we have gone from a situation featuring an overall acceptance of this rule system (involving branch-wide national bargaining) to one marked by the emergence of management rules based on a more individualised type of employment relationship, and on modes of negotiation that come closer to the plant and territorial level.

Nowadays firms need to build flexible links that are grounded in technical and industrial cooperation, especially where innovation and technological transfer processes imply the existence of an employment relationship that is based on learning (whether individual or collective) and not on frozen competencies. These kinds of cooperation, which signify new social compromises between employers and employees, are facilitated by geographic proximity between actors. As the dominant institutional benchmarks, the key actors in a territory (firms, public institutions) will then participate in the building of a specific employment relationship.

This is what is now emerging, with the new roles being ascribed to regions (seen as strategic levels) and local echelons (inter-communities and/or '*pays*', seen as levels whose implementation is closer to the point of contact). Such roles relate to employment, management, training, careers orientation and placement, and are played out in configurations whereby the state,

territorial authorities, professional branches, firms, labour unions and so on are repeatedly mobilised. Clearly we need further studies to improve our understanding of the effects of these developments.[8]

## 2.4 What Dynamics for Local Governance and Global Regulation?

The deployment of the aforementioned forms drives local governance as well as new modalities for their interlinkage at a more global level – be it national, European or even worldwide.

These developments are mainly characterised by a tendency to decentralise the resolution of productive and institutional problems at a territorial level. At the same time, however, these problems depend on places where a power that is external to the territory in question is being exercised: large firms' parent companies, the state, the EU and so on. These then become the ultimate decision-making centres for the most strategic aspects of such problems. In processes of that kind, organisational and geographic proximities are combined by means of a functional and pragmatic logic. As such, territorially generated institutional proximities are relatively weak, while local governance is unstable and subject to global institutional constraint. This is related in part to the theoretical concerns underlying Sugden et al.'s proposal for 'governance' assuming a central role in the analysis of clusters (Chapter 3), and also to the argument in Pitelis and Psieridis (Chapter 2) that local clusters of firms may potentially avoid some of the 'strategic failure' implied by dominant transnational firms and assist in creating a healthier industrial structure.

The increasingly pervasive contract–project tandem, something that has become the favoured mode for coordinating actors' interventions (at the level of a given territory or between different levels on the spatial scale) typifies these developments. The main usefulness of this tandem is that it offers a functional network for dividing up and coordinating tasks, thus facilitating the achievement of specific aims. But on the whole, it masks the domination logic that is at work, as it sometimes induces local actors to set aside their differences and to look for agreement on concrete decisions. Such a functionalist treatment of the problems overlooks some of the more contradictory aspects of the aims being pursued. Thus what we are witnessing is a weakening of practices based on negotiation and on the development of true social compromises, to be replaced by a concerted drive towards 'problem-solving' logic. In this context, negotiation does seem less necessary, and is therefore avoidable (and even replaceable) by other practices. So Jobert (2000) is right to point out that in today's contractual procedures, 'what counts more is the contract elaboration process and not the act itself, i.e., the partners' commitment is more important than the

product they come up with'; the goal being to 'get actors involved in wider and more global projects than the actual object in question'.

In conditions such as these, local governance tends to be reduced to a mainly organisational dynamic comprising a sum and/or succession of contracts–projects, supported by local institutions on an *ad hoc* basis, and leading to a specific local work management mode. In other words, the local space obeys a functional logic,[9] one that meshes with the corporate world. This makes it very hard to build up institutional compatibilities and compromises between public and private sectors' actors with different (and even diverging) interests. Yet it is the stability and coherence of these compromises that guarantees the success of the local projects in question; and even more importantly that supports, in the long run, truly territorial types of dynamics based on a coverage and/or interlinkage of geographic, organisational and institutional proximities.

It remains the case that dynamics of this sort are not entirely absent from today's territorial reality. In fact, a 'meeting' between these three forms of proximity is always possible, and the aforementioned tendencies are not univocal. It is therefore possible to combine an organisational dynamic locally with a strong institutional dynamic. This creates a territory-building process that is not only capable of adapting to norms coming from above, but can also change the direction of (and even transform) orientations, objectives and rules whose impact is more global. One example is the way in which the Toulouse Science Centre was able to develop, and actually push through, its SPOT satellite project when dealing with France's national CNES research authorities (Colletis et al., 1999).[10]

A context of this sort raises a number of questions relating specifically to key actors' positioning, and a territory's degree of openness to other levels of regulation.

As already mentioned, the issue of how key actors (like big companies) are positioned is a crucial one, both in terms of the way local governance functions and also with regard to its articulations with the other levels of regulation. In reality, these firms' strategic decisions have a strong influence on local dynamics, but this can be either positive (investments, creation of jobs, participation in the creation of local resources, etc.) or negative (decision to sell or close a site, etc.). Yet at the same time, these decisions usually remain completely outside of the field where local governance is actually taking place, and can require of the local actors that they base their productive development on material and/or organisational investments, refusing almost systematically to entertain questions about the strategic options or intentions being manifested as regards the territory concerned; this is a problem specifically identified by Sacchetti and Tomlinson in the cases of the North Staffordshire ceramic and Prato textile clusters,

for example, in Chapter 11 of this volume. As such, the local actors do not possess all the elements enabling them to monitor the coherency and longevity of the projects that are being implemented in this manner (Perrat, 1998). This raises an issue in terms of articulating the various 'company territories', and regional and local territories, in the institutional sense of the term.

The other crucial issue is whether or not local governance is interlinked with the other levels that will be taking part in the emergence and dynamics of such broader spatial regulations. In fact, this articulation is not only the doing of large companies, but also of the state and other major actors (labour unions etc.) impacting on the territory and the overall socio-economic system. How is it possible, in this sort of context, to ensure the global viability of compromises that are agreed locally by a territory's key actors? Is the emergence of a new model of cooperation between the state, large (industrial and financial) firms and other key actors likely to foster the coherence that this viability requires? Are the economic and institutional dynamics featuring in the specification of territories (see Section 1) precursors of new compromises and new coherencies at a macro level?

## CONCLUSION

This chapter did not set out to provide answers to these questions, but we do believe that the headway we have made casts light on the conditions currently determining how actors' coordinations can develop at a socio-economic level (territory, region, nation, group of nations) and between several of these levels. In particular we have illustrated the need not to construe such coordinations as merely functional, organisational and procedural types of logic. We have to discuss the issues they raise in terms of power, but also with respect to the rights that will have to be (re)built in order to combat the ongoing trend towards subordination, with the inequality that such logics convey.

In a phase of capitalism that calls for new modalities of regulation (whether at a national, continental or worldwide level), a need has emerged for regulations that are interlinked, in order to produce territorial dynamics and create local resources. This is how we can counter the purely financial logic that many parties pursue nowadays – a logic that has increased polarisation phenomena and reinforced spatial inequality.

Giving thought to the interlinkage between the different scales of regulation could help us to imagine the bases for an economic policy whose purpose would be to encourage a more balanced type of local development, one that is marked by greater solidarity. In our opinion, this kind of policy

cannot be based on a market logic alone. Instead it would have to fit into long-term policies aimed at building up specific territorial resources, notably organisational capabilities that are specific to local actors. These would guarantee a more autonomous type of local development, one within which public institutions would have a leading role to play. In turn, such observations have significant implications for the forms of clusters, and in particular the types of governance relationships required within and between clusters, that are likely to be successful in a globalised economy.

## NOTES

1. The relationship between trust and proximity, as analysed in detail by Dupuy and Torre in this volume (Chapter 8), is likely to be significant for this process, as are various issues surrounding the provision of public goods discussed in the chapter by Bellandi (Chapter 4).
2. A system by which actors of a '*pays*', that is, a local area around a medium-sized town, must agree on a development project and contract with the regional authorities in order to receive subsidies to realise it.
3. Again, see also Bellandi in Chapter 4. Different mixes of governance in local production systems are also analysed by De Propris and Driffield in Chapter 6.
4. Here we refer to the regulation theory, cf., *inter alia*, Boyer and Sallard (2001).
5. See note 3. See also the chapter in this volume by Aranguren et al. (Chapter 12), which discusses issues of territorial dynamics with specific regard to application of cluster policy in the Basque Country region of Spain.
6. See Gilly and Dupuy (2005).
7. See, for example, Henry and Pinch in this volume (Chapter 5) on the concept of 'architectural knowledge' at different territorial scales, and also the chapter by Di Tommaso et al. (Chapter 13) on spatial concentration in 'high-tech' industries.
8. The chapter in this volume by Quintana and Pulignano (Chapter 9) explicitly examines the interface between industrial relations and the emergence of clusters of firms operating in a local territorial context.
9. The 'Voynet' Law demands managing '*pays*' in a 'mission' logic. Lettre de la DATAR, No. 167 (Autumn 1999).
10. See also the chapter by Di Tommaso et al. in this volume (Chapter 13) for a brief discussion of the role of government intervention in developing bio-tech clusters in France.

## REFERENCES

Azema, A. and Parthenay, D. (2001), 'Les schémas de services collectifs, poisson pilote des politiques publiques territoriales', *Territoires 2020*, No. 4, DATAR, La Documentation Française, pp. 45–9.

Boyer, R. and Sallard, Y. (eds) (2001), *Regulation Theory: The State of the Art*, London and New York: Routledge.

Colletis, G. and Gilly, J.-P. et al. (1999), 'Construction territoriale et dynamiques économiques', *Sciences de la Société*, No. 48, October.

Gilly, J.-P. and Dupuy, Y. (2005), 'D'un espace d'agglomération à un territoire de spécification: la dynamique des activités aéronautiques à Toulouse', in *Les régulations secteur-territoire*, Paris: La Découverte.

Gilly, J.-P. and Torre A. (eds) (2000), *Dynamiques de Proximité*, Paris: L'Harmattan.

Gilly, J.-P. and Wallet F. (2001), 'Proximities, local governance and the dynamics of local economic spaces: the case of industrial conversion process', *International Journal of Urban and Regional Research*, **23**(3), 553–70.

Jobert, A. (2000), *Les Espaces de la Négociation Collective, Branches et Territoires*, Paris: Octares Editions.

Perrat, J. (1997), 'Une clé de lecture du rapport firmes/territoires: la notion d'externalité', *Espaces et Sociétés*, No. 88–9, pp. 207–36.

Perrat, J. (1998), 'Stratégies globales des firmes, gestion locale des ressources et marge de manoeuvre des acteurs territoriaux', in G. Loinger and J.C. Némery, *Recomposition et développement des territoires – Enjeux économiques, processus, acteurs*, Paris: L'Harmattan.

Perrat, J. (2002), 'Dynamiques territoriales et dynamiques salariales: de nouvelles règles pour une nouvelle donne?', *Géographie, Economie, Société*, **4** (4), 405–26.

Rallet, A. (2003), 'L'économie de proximités', *Etudes et Recherches sur les Systèmes Agraires et le Développement*, (33), 11–25.

Ughetto, P. (2001), 'Tendances contradictoires de l'évolution du travail et renouvellement des analyses: une interprétation à partir des représentations de l'acteur patronal', *Revue de l'IRES*, No. 37, 31–58.

# 8. Local clusters, trust, confidence and proximity

**Claude Dupuy and André Torre**

## 1. INTRODUCTION

The question of trust, although seldom studied as such, is often at the heart of local development analyses. The term is frequently used in research studies about districts or local systems of innovation. For Camagni, for example, it is the family or cultural bond and the relation of trust that goes with it that explain the agglomeration process. As for Becattini (1992), he believes that trust plays an important part in the socio-economic construction of relations in industrial districts, thus following Marshall's (1898) hypothesis which suggests that 'informed' trust is generated by the relations between the actors of one group (firm, district) and is then diffused into this collectivity. Trust is often presented as an indispensable ingredient of collective action and of the group's constitution at local level, or, to put it more simply, as an element that is inseparable from local interactions. It is thus a crucial concept in analysing the requirements and impacts of local clusters, something that is reflected in many of the other contributions to this volume.

Researchers in spatial and regional economy are interested in trust relationships because they relate to two conjectures that can be summarised as follows:

1. Local interactions have a crucial advantage over long-distance relations.
2. Local interactions are based on relations of trust.

From the combination of these two propositions, many researchers deduce that the existence of trust relationships is a determining advantage in the success of local systems of production or groups of producers, in particular because it protects against the anonymous nature of long-distance relations.[1]

Interest in the concepts of trust and cooperation (two concepts that are often assimilated) is the result of Anglo-Saxon (Gambetta, 1988; Lazaric and Lorenz, 1998; Nooteboom, 2002; Weber and Carter, 2003) and then French (Aubert and Sylvestre, 2001; Laufer and Orillard, 2000; special issues of the *Revue du Mauss*, 1994 and of *Economies et Sociétés*, 1998) analyses of trust relationships and of the application of this concept to concrete situations. Indeed, this type of research provides opportunities to analyse the altruistic and super-cooperative behaviour of economic actors. These opportunities are exploited by researchers in spatial and regional economy because of their growing interest for questions related to learning and local organisational dynamics. Three main directions have been explored:

1. The analysis of *milieux* and innovating *milieux* (Hansen, 1992; Camagni, 1995). In this case, trust is considered as a commodity that generates solidarity between actors – a process that has more to do with the emergence of a collective behaviour than with an explicitly cooperative relation. From this point of view the definition of trust adopted is very close to the one proposed by Arrow (1974), who considers trust as a necessary lubricant of social relations.
2. A direction explored by conventionalist authors, and primarily by Storper (1995). They believe that the extreme complexity of inter-individual exchanges resulting from the high degree of uncertainty in transactions generates the need for interpretative intermediations, that is, local conventions or culture.
3. In the analysis proposed by researchers who study proximity dynamics (close to the spatial and regional economy described above but more evolutive), emphasis is put on the existence of community confidence, but also on determinants that are more related to individuals or even to the organisations in which they are embedded (Dupuy and Torre, 1998a, 1998b; Torre, 2000; Torre and Chia, 2001). In this case, a distinction is made between trust and rules inasmuch as trust is non-alienable and is therefore of great importance in face-to-face relations. It can thus help solve production-related problems.

These analyses highlight the link between trust and location, social relations being embedded in local contexts of interactions. However, they do not consider situations which go beyond a context of local interactions and which occur 'in a modernity that increasingly tears space away from place by fostering relationships between absent "others", locationally distant from any given situation of face-to-face interaction' (Giddens, 1994). To transcend this slightly naïve outlook on the trust concept and the idyllic role it is believed to play at local level, it is necessary to thoroughly analyse

the relation of trust generated between actors who are 'embedded' in social networks. We shall emphasise its importance in an analysis of the role of proximity in the collective dynamics that trust contributes and in the relations between organisations and territories.

## 2. THE RELATION OF TRUST: BEING CONFIDENT AND TRUSTING

Although attractive, the idea that successful local relations are founded on trust deserves careful examination, if only because it can be difficult to define terms such as trust/confidence, collective construction or proximity. In particular it raises the question of the construction of social relations, which largely conditions the establishment of rules of coordination among actors. Furthermore it supposes that the continuity of the system depends on trust, a concept that is often too vaguely defined. Thus there is an ambiguity between the concepts of trust and cooperation; they are often seen as causally related or even assimilated.

Arrow's cutting remarks (such as 'trust cannot be bought', 1974) can help in understanding relations of trust, but it is necessary to be a little more precise in order to make the concept operational. We note, first of all, that a relation of trust takes all its meaning when it is put in a context of uncertainty, in which the actors have imperfect or incomplete information (uncertainty that affects the present relation) or in which it is difficult to make accurate anticipations (uncertainty due to the difficulty of predicting the future actions of competitors or partners).

### Confidence, Risk and Uncertainty

The question of confidence would obviously be of no interest if the future were known with certainty. It is precisely because of the partly or totally uncertain nature of the future that economic actors may or may not be confident.

Before the Second World War, two important authors worked on the topic of action in contexts of uncertainty. Knight made a distinction between non-measurable uncertainty (uncertainty) and measurable uncertainty (risk), and Keynes distinguished the improbable future from the uncertain future. Nowadays, economists distinguish three forms of future:

- the certain future, for which confidence is unnecessary since economic actors are perfectly well informed about what is going to happen;

- the risky future, about which actors have some information and can anticipate different scenarios based on objective probabilities;
- the uncertain future (or radical uncertainty according to Keynes), to which actors can only accord subjective probabilities.

Thus there are situations when actions are 'risky'. The question of confidence is related to a subjective view of the future and to the existence of risk. It is a modern question: in traditional societies, the belief in cosmology, fate or divine intervention implies that the results of activities reflect the will of gods (Luhmann, 1979). In modern societies, on the contrary, 'acceptable' risk varies according to the context and takes two main forms. The first form is the one that is of interest to us here because it is directly related to proximity relations. Beyond this pattern, however, there can be relations between economic actors in contexts of anonymous commitments, and relations of confidence can also emerge in abstract systems of various natures: money, hygiene and quality rules, designations of origin in the field of agriculture (see below). Confidence in these abstract systems or in what may be called mechanisms depends on the reliability of the rules that govern them. They can be the belief in science and in the efficiency of monetary policies, for example, or in the rules of traceability in the field of food. Thus in the context of the stock exchange, for instance, institutional safeguards limit risk without eliminating it. Lyotard (1979) emphasises that postmodernity is characterised by doubt as to the efficiency of these abstract systems (BSE, for example), a doubt that can lead individuals to relocate their interactions.

Thus, to go beyond the phrase used by Guennif (2000), one could say that 'Confidence is the daughter of uncertainty and risk'.

## Being Confident

But how does an individual react in a context of uncertainty or risk? Let us imagine that an economic actor wishes to undertake an action although he does not possess all the available information (if the information is available), and that he does not wish to acquire this information (where this information can be purchased), nor spend time researching. As he undertakes the action in an uncertain environment he must make a subjective assessment based on incomplete information. If he believes that the information he possesses is sufficient, then he acts in a context of uncertainty.

For Knight, the actor reasons in a context of uncertainty. Keynes used the term 'animal spirits' to qualify this natural dynamic that urges economic actors to act even in uncertain situations. In both cases the actor adopts a confident attitude. This leads to a first definition (Guennif, 2000): being

confident means 'undertaking actions while accepting the possibility that the results of the actions might not be the ones expected. In other words, these anticipations might be met with disappointment. When an individual accepts this possibility, he proves confident'.

In short, confidence is the mother of action.

## To Trust (1): Community Confidence

The above definition of confidence is too general to characterise all social relations and does not include the direct relation of one individual with another. One way of describing this type of relation is to relate it to faith, which corresponds to what is commonly called 'blind trust'.

It corresponds to an absolute, domestic confidence and is summarised by Livet (1994) as follows:

- two actors X and Y are uncertain as to whether Y will carry out action A. This is presupposed but not specified explicitly;
- X puts aside this uncertainty and does not try to measure it or limit it by imposing additional constraints;
- neither X nor Y looks for guarantees.

'Blind' trust requires that no guarantees be demanded, giving them up being a proof of trust: if X asked for guarantees, he would damage the relation. This particular trust relationship corresponds to an 'oversocialised' relation between individuals whose actions are embedded in a set of generally informal rules governing the family or community to which they belong. It is a variable that is attached to a community (religious, ethnic, origin, etc.) rather than to a person. However, the trust thus given to a person can be damaged by this person's future actions.

## To Trust (2): Interpersonal Confidence

Trust may also be seen as interpersonal: in this case it concerns relations between individuals rather than with a community.

Interpersonal confidence is acquired through mutual commitments, signs that one sends to the others to justify his trust. It is a type of trust that is directed towards a person. Thus interpersonal confidence is not a commodity that exists before the social relation; nor is it stored information or a resource from which actors can draw. As we shall see below, this type of trust, for which proximity might play an important part in the case of tacit or informal face-to-face relations, has a dialectical relation with proximity and reciprocity.

We present it as follows (Dupuy and Torre, 1998a):

- X is uncertain as to whether Y will carry out action A, and Y is uncertain as to whether X will carry out action B;[2]
- X commits himself in order to limit uncertainty about his future behaviour and to prove his goodwill to Y, and reciprocally (this leads to cooperation); from the repetition of these actions and the interweaving of the commitments, the relation of trust is generated.

Trust is neither absolute, nor necessarily symmetrical, nor transitive.

Analysing a commitment between two individuals enables us to define more precisely the nature of their face-to-face relation. When an individual commits to undertake something, he responds to two preoccupations: first, limiting his behavioural freedom by providing in advance some indications about how he is going to react to certain evolutions in his environment; second, reducing uncertainty as to the behaviour of the other actor by diffusing information concerning his future decisions. When the commitment is public, it is easier to anticipate the other actor's behaviour, which is particularly important in the constitution of local systems that must also integrate a collective action dimension. Indeed, lifting some of the uncertainty might facilitate the common elaboration of a development policy, for example.[3] Naturally, commitment is not always used to generate trust, as shown by the example of the credible threat. But in the case of a cooperative relationship, it is made up of signals of goodwill that must show that one is prepared to collaborate in the medium term.

Thus, interpersonal confidence is the mother of interaction.

## To Trust (3): the Question of Pre-existing Trust

If the term 'interpersonal confidence' is taken literally, there cannot be any construction of trust. Indeed, this type of trust rests on an economic calculation that aims to eliminate uncertainty concerning the terms of the exchange, and this very calculation leads actors to distrust the actions thus undertaken. This approach intrinsically implies the existence of mistrust, and thus justifies the expression 'trust paradox'. Either one shows absolute trust from the start or one keeps away from trust relations.

In order to solve this dilemma, one must make a distinction between trusting a person or his/her future intentions from the start (a kind of trust that bears some uncertainty) and entering a trust relationship. Pre-existing trust, founded on the person's reputation or on community attributes, can be disappointed by future actions. From the point of view of the person who seeks to inspire trust (Mayer et al., 1995), the latter rests on different attributes that may be mobilised at different moments (the competence of

this person, his benevolence towards the possible believer (i.e. the extent to which he wants to be believed) and the integrity attributed to this person (i.e. how strictly he abides by the rules which the other believes in). One individual's commitment to collaborate with a person depends on his degree of initial trust in that person; and the introduction of trust is achieved by initially carrying out a calculation between the degree of risk perceived and the level of trust. As the relation develops, the individual acquires new information – in particular concerning the partner's integrity – which he uses to back up his judgement; and new attributes are thus mobilised.

The question that must be raised, then, is that of the degree of trust granted to the partner: do I trust him/her a little, entirely or not at all ? As Servet (1994) has shown through his imaginary trust axis, there are several types of relations ranging from distrust (no interaction) to faith:


## 3. BUILDING TRUST

How can an actor limit the risks related to interaction in the context of uncertainty?

One way of addressing the problem is to see trust as the result of a rational calculation by individuals. This is the path chosen by Kreps (1990), whose model has now become a reference (see Box 8.1).

### BOX 8.1 KREPS'S REPUTATION MODEL

Kreps's model is simple. An individual A1 must decide whether he should trust individual B. A1 will not meet B again. B must decide whether he will betray A1 or cooperate with him. B will subsequently meet A2, A3, A4. Individuals A1 must therefore choose whether or not they will cooperate with B. If B has honoured his commitments, then his reputation is intact; if he betrays one of the As during the following round, his reputation will be damaged forever. This simple model leads to an obvious strategy for B. If the game is repeated indefinitely, it will be in B's interest to honour his commitments. His 'honourable' strategy is a source of wealth because it provides him with the possibility of future interactions.

This model, which proves useful for analysis of the relation between trust and proximity, and is therefore of relevance for the issue of trust in clusters, is limited to the context of interpersonal confidence. The individual is anonymous; he has no reputation during his first interaction (no pre-existing trust). This is followed by a logic of self-reinforcement that encourages him not to betray trust.

Kreps's model has some limitations that are related to the chosen hypotheses:

- Actors A are informed about B's past behaviour; the relationship is interpersonal and not anonymous.
- The higher the degree of anonymity, the more betrayal can develop.
- The trust balance is jeopardised by occasional 'strategies of betrayal'.[4]
- The fact that the game is repeated infinitely influences the observed result. If the game had an end, actors A would be overwhelmed by the strategies of the 'deceiver' who hides his game until the last round and then suddenly betrays them, a strategy that is based on the increased trust resulting from the effect of reputation and the positive experience due to the repetitions.
- Actors A are informed about B's behaviour and this information is reliable (transitivity).

## Reputation

The punishment mechanism described in Kreps's model would not be sufficient to guarantee cooperation in a repeated game. What guarantees cooperation is what Kreps calls reputation, which corresponds to the actors' memory: in a situation of imperfect information about what a partner or adversary could gain by collaborating or betraying (i.e. of uncertainty about their future actions), a player's reputation is good if he has never cheated and it is irreparably damaged when he does. Reputation is acquired, and is never given beforehand. Thus common knowledge leads to a self-validation of the process (Orléan, 1994), trust resulting from the establishment of a virtuous circle that guarantees cooperation.

Each player invests resources in cooperation without knowing whether or not his adversary will take advantage of them, the process of coordination occurring through mutual observation of the partner's actions (which is essential here). The type of reputation highlighted here rests on a circular logic which forces the trusted party to honour the trust bestowed upon them inasmuch as, if they abuse it, they deprive themselves of future opportunities to engage in profitable transactions. Indeed, the commitment to cooperate

(and therefore to trust and anticipate that it will be honoured) must be evaluated according to past cooperations and therefore to the already acquired reputation (bad or good). This is true in a situation where two actors have already cooperated in the past and must now revise (or not) their commitments depending on past events. This rule also applies to new cooperation opportunities, but with other partners. In this case the repeated game no longer concerns two actors only: Kreps suggests the possibility of a reputation that can be transmitted to third parties and can be used in new relationships.

The distinction between trust and reputation rests on the fact that the latter can continue to exist even though it is damaged (bad reputation), whereas, in such a situation, trust disappears. Reputation can therefore represent one of the constitutive trust components, one of the attributes which, beside community recognition, for example, can be mobilised in order to engage (or not) in a trust relationship. It goes hand in hand with interpersonal confidence, and is built on repetition, but is not mobilised in the case of community trust. However, for Kreps, it is possible to engage in a relation in the absence of reputation or pre-existing trust. This puts his model under the yoke of the trust paradox mentioned above.

## Can Interpersonal Confidence Precede Action?

In Kreps's model interpersonal confidence is the result of action. If we eliminate the hypothesis according to which B's reputation must be intact during the first interaction, we can consider that there can be trust prior to the start of the relationship. Pre-existing trust does not rest on the succession of actions aimed to establish a reputation. In this case, A1 will trust all B1 (and no longer one B only), but possibly not C1.

Pre-existing trust is not attached to the person but to the community to which the latter belongs, and within which the individuals can learn and then transmit social and standard behavioural conventions that are easily recognisable, inside and outside the group. Therefore, if this information system (based on social communication) does not fail, it guarantees cultural homogeneity and is the foundation for the continuity of trust relationships, in which all partners have a sense of common identity. The circulation of information provides the basis for the individuals to recognise each other. Trust is then no longer only a commodity that exists before the start of the social relation; it is also developed by this relationship.

We can go further by saying that, in such relationships, an actor is never completely anonymous: not only can he benefit from the reputation he has acquired during previous interactions, but he is also attributed a number of community 'qualities', which enable him to reinforce the pre-existing

trust which others had previously shown him. 'When X tries to evaluate whether or not he should trust Y, what he analyses is the nature of Y's relationship with a certain community and its rules: is he a reliable member of this community?' (Orléan, 1994, p. 22). The action can be based on the reputation or on community signals, which rest on norms or conventions that the community members use to decide whether or not to act in a context of uncertainty. Economic rationality alone cannot explain all the actions undertaken by individuals.

**First Result: the Two Dimensions of a Trust Relationship**

There are therefore two dimensions in a trust relationship: an undersocialised dimension in which trust is only the product of a 'rational' interaction, and an oversocialised dimension in which it is 'completely' embedded in the social networks (see Table 8.1).

*Table 8.1 The two dimensions of a trust relationship*

| Undersocialised dimension (interpersonal confidence) | Oversocialised dimension (community confidence) |
|---|---|
| • Because transactions are repeated, they facilitate the relation of trust<br>• This repetition is self-reinforcing<br>• The relation is limited to an inter-individual context<br>• Trust is the result of an individual search for gains<br>• Reputation is 'public' information | • All human relations are 'embedded' in social networks<br>• The relation of trust rests on the reputation that lies within these networks<br>• Market rationality does not explain all economic behaviours |

Analysing both of these dimensions enables us to better understand the content and characteristics of a relation of trust, as described in the literature, and as related to local clusters:

1. It is set in the framework of a face-to-face interaction and thus can lead to 'strategic' constructions of trust.
2. An individual is never 'disembedded' from a social network; he is always 'located' and 'locatable' by other actors (through his origins, habits, reputation, etc.).

# 4. THE DIFFERENT LEVELS AND TYPES OF TRUST

The question of trust therefore oscillates between an 'incarnated' dimension in bilateral relations which Luhmann (1988) calls familiarity ('familiarity is an unavoidable fact which depends on experience and on the ability to symbolically cope with our perceptions universe', p. 236), and a wider vision which he calls 'confidence' ('confidence refers to some expectations and their distinction is based on the different perception and evaluation of possible happenings', p. 236).

Luhmann makes a clear distinction between these conceptions: 'confidence in the system and trust in the partners'. He also emphasises that the wider dimension of confidence implies a certain number of features:

1. The cognitive attitude of an actor relative to a viable way of acting in a structured but unpredictable environment.
2. Confidence implies a wider perspective of a larger, not necessarily relational context.
3. Confidence is particularly useful when describing an actor taking decisions or acting in a structured context without referring to relational contracting.

This distinction also refers to two levels of embeddedness of social relations: the first level (traditional in Granovetter's sociology of networks (1978)) is that of inter-individual relations; the second is that of a more structural embeddedness in the social system, in particular in the institutional architecture that partly controls individuals' behaviours. Figure 8.1 shows this distinction, which is essential to understanding different levels of trust.

We shall not discuss the interpersonal level which, as we have seen, has been the subject of many studies. Our aim is rather to show that trust is not limited to a contract but is 'each private actor's relationship with the community as a whole'. Inter-individual relations are also embedded in a wider dimension, which includes the institutions and the economic system as a whole.

Why is an individual confident? Because he trusts the rules of the institutional game in which he operates; but also because he trusts the economic system that provides a framework for the rules of the game. Whether his confidence is justified or not is irrelevant.

- He is confident, first, because there is a routine, a repetition of exchanges, and a 'framework of reference points and roles in which private actors fit' and feel protected against uncertainty. The actors interact

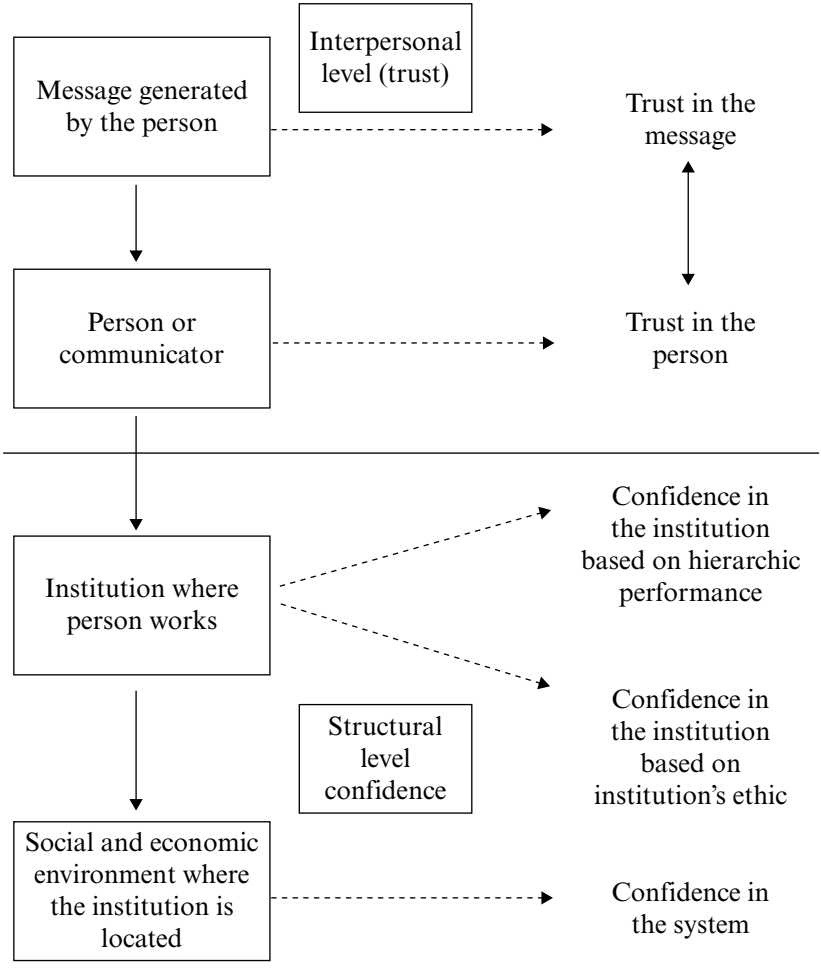



*Figure 8.1 The different levels of trust*

in a framework of adaptive anticipations, which above all requires learning processes and behavioural regularity, facilitating behavioural convergence (Krugman, 1991). This is 'methodical confidence'.

- Confidence also refers to the relationship with the institutions that govern the rules of the game. This type of confidence can only exist if individuals accept the legitimacy of the institutions that make the rules of the game. This type of confidence can be called 'hierarchical confidence'. The stability of these rules plays an essential part; 'they

provide a framework for the anticipations'. Unstable rules left to the arbitrary judgement of actors adversely affect the anticipations, which are then made in a context of radical uncertainty.

- The institutional game takes place within a normative system that defines conventional ethical rules and therefore plays an essential part in the making of the institutional rules. Therefore confidence is also ethical.
- Finally, actors and institutions are embedded in a socio-economic system whose overall dynamic is perceived by the actor. Confidence is therefore systemic.

## Euphoria and Systemic Confidence

The convergence of representations can lead to the localised development of a 'climate of confidence' that generates localised euphoria of various origins (the gold rush in the USA, speculative and real-estate euphoria in Silicon Valley at the end of the twentieth century, etc.). The development of these phenomena deserves our attention because it enables us to better analyse the possible relation between 'trusting' and 'being confident'. To take an example: in a situation of economic uncertainty actors minimise risks by seeking guarantees (the banker will ask for guarantees, the firm will limit its investments, etc.). Because they are not confident, the economic actors, in turn, do not trust. Conversely, if the situation improves, the actors will take more risks economically but also in their relations with other actors.

This dynamic, which combines both forms of confidence (interpersonal-level trust and structural-level confidence) can lead to collective states which Braudel qualifies as 'excesses of confidence' (1979). Everything starts with an event (economic or not, global or localised) that reinforces confidence. Then optimism sets in and reinforces itself because of the localised interaction among 'confident' actors. In this climate, the actors, prepared to take greater risks, progressively become the victims of what may be called the illusion of confidence, which can naturally translate into more risky transactions and a weakening of the demanded guarantees. The confidence is reinforced by the fact that, in this type of situation, interactions are important and facilitate the development of localised self-fulfilling prophecies, or by the fact that the actors belong to the same social networks.

## The Confidence Crisis

Conversely, when the situation is reversed, the actors try to get out of their risky positions; guarantees are required, and belonging to the same social

circle is no longer sufficient. Marshall (1898) describes this phenomenon very well:

> Adventurous transactions have consequences that rapidly go beyond those responsible … When the credibility of a bank is threatened by rumour they are the first to rush to exchange their notes. They were confident in complete ignorance, they challenge one another in ignorance and fury … this is how bankruptcies multiply and the crisis of confidence becomes general … The fire spreads from one house to the next … (p. 146).

Thus, we could mention many examples of localised crises that generate cumulative effects (firms or shops close down, followed by real-estate crises), all reflecting the important role of confidence in the processes of development or recession of local systems.

## 5. CONFIDENCE, PROXIMITY AND LOCAL NETWORKS' DYNAMICS OF EVOLUTION

As discussed above, interpersonal confidence rests on a learning process made up of mutual commitments and signals that one gives to the other to justify his trust. It is a dimension that is attached to the person. It is also subject to the risk of opportunism and to the emergence of conflict. Thus the question raised is that of the evolution of rules that enable actors' networks to function:

- Sometimes collective action involves implicit intentions of actions and rests on the personal reference points and values of each participant. In this case, trust is maintained thanks to a number of reference points and rules that govern the community or interpersonal relations.
- Sometimes collective action rests on intentions of actions that are explicitly stated and supported by structures of actions that are also explicitly formulated (such as rules enacted by the governance structure). In this case hierarchical confidence plays a central role. The networks 'get organised', and free themselves from the interpersonal relations game.

Figure 8.2 shows how a network founded on interpersonal relations (interpersonal confidence) or the sharing of certain values (community confidence) can evolve towards more organised forms (hierarchical confidence) when conflict or opportunism emerge. The most socialised forms of trust can no longer eliminate the risk of opportunism. It is therefore logical to accept that the conflict can be solved thanks to an institutionalisation of the network's rules.

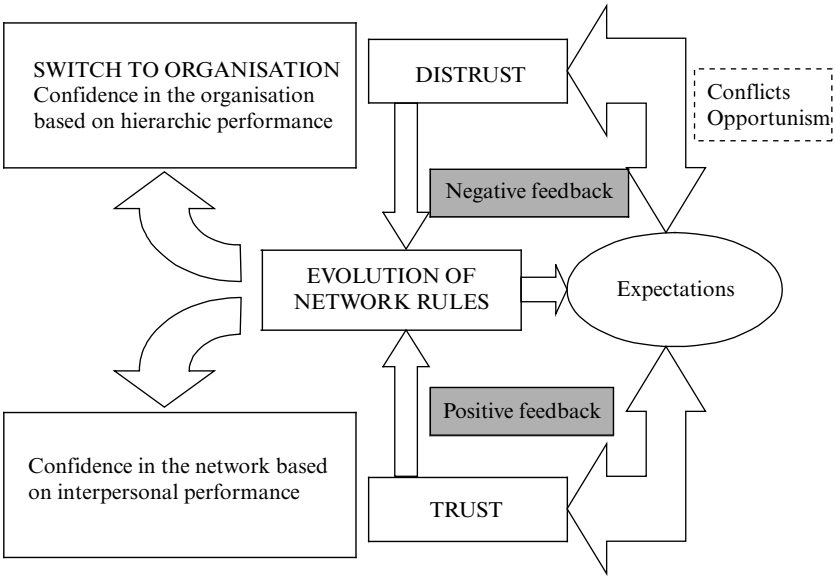



*Figure 8.2 The evolution of organised forms of confidence*

## Community Confidence and Proximity[5]

When local networks rest more on relations of community confidence, their spatial bond is generally strong. In this case, confidence goes hand in hand with proximity.[6] The network is fostered by solidarity between actors located in the same space, as is the case in industrial districts or even innovating *milieux*. The existence of a trust relationship between the actors enables them to anticipate more efficiently their common future, by reinforcing the preference for the future and by facilitating their quest for relationships that generate mutual benefits. From this point of view, trust is one of the elements that make it possible to better understand local dynamics, such as they appear at the domestic level.

However, it is important to bear in mind that the existence of community confidence in no way guarantees the total absence of problems in the future, first because a harmonious relationship does not prevent actors from engaging in other relationships that will lead to a betrayal of their present partners or from making errors in anticipating future developments. The anticipations made by actors are seldom rational (i.e. implying knowledge of the model). They anticipate with difficulty the future evolutions of the system, including changes coming from the outside, such as the introduction of new actors or new behaviours. Similarly, actors can get caught in harmful

processes that are irreversible because of the technical characteristics of the system (path dependency) and of phenomena of organisational learning (organisational inertia). Finally, trust can generate inertia that translates into monopoly rents or suboptimal routines, reproduced by the actors.

## Interpersonal Confidence and Proximity

If local organisations rest on interpersonal confidence, their spatial bond may be strong, but it is also more easily reversible. The relation that emerges between the actors is founded on the repetition of interactions and on the establishment of reputations.

Various studies have shown that a proximity relation can facilitate the setting up of cooperation or innovation networks at local level. In this case, trust is indeed the lubricant of social and economic relations, and the repetition of face-to-face relations, allowed by geographical proximity, is conducive to partnership relations.

Time plays a central role here. Indeed, trust is built progressively through interactions, and tends to reinforce itself when the relationships are positive.[7] As time goes by it becomes increasingly difficult for local actors to get out of this relation and to relocate elsewhere. Indeed, the risk calculation becomes straightforward: exchanging a relation of trust (which we assume is strong) for a situation of strong uncertainty somewhere else. In this case, it is the existence of other incentives (fiscal, localisation in the proximity of markets or competitors) that push actors to relocate elsewhere.

However, if the system in which an actor has been interacting is essentially characterised by relations of distrust, then the social cost of relocation is relatively low. Unlike in the case of community confidence, leaving the local system does not lead to conflict with the community of origin and can therefore be undertaken without too much difficulty. This is why technopoles or technological parks try to promote informal and personal relations among local actors, so as to integrate them in some degree into their local community and to limit the temptations to relocate (because of territorial competition, for example).

## Confidence and Local Network Dynamics

Taking into account the hierarchical dimension of confidence, which is essential to understanding production and industrial relations,[8] allows us to go beyond the opposition between over- and undersocialised conceptions of trust. Indeed, although the hierarchical approach must take into account interpersonal relations (present in the undersocialised version), it cannot be dissociated from a community dimension (present in the oversocialised

version), one that is easily seen in the case of relations within firms or between different organisations, as reflected by the terms 'firm culture' or 'community of interest'. Furthermore, the introduction of geographical proximity, which makes the analysis yet more complex, requires more than the oversimplistic dichotomy between two polar dimensions. This is why it is necessary to introduce a dimension of trust that is particularly well adapted to the case of production relations: hierarchical confidence integrates heterogeneously the over- and undersocialised dimensions of trust relationships.

Hierarchical confidence is an extension of the interpersonal trust relationship (face-to-face relation) to the principle of collective action. It is of great interest in the analysis of groups' behaviours and collective actions. It goes beyond the mere face-to-face relation, and takes into account rules applied in the organisation concerning the answers to provide or the procedures to implement according to predefined situations. In the case of a firm, these rules are related to the internal hierarchy, the wage calculation process and so on. In the case of network organisation, the rules concern compliance with norms of production, trade union membership and the like. As a result, the commitment can have two dimensions, explicit and implicit:

- It is explicit when the commitment was made beforehand, and when individuals commit to abide by internal rules. In this case the commitment is a strategy of collective action for the benefit of the production of a common good. When rules are tested and interpreted mutually, they facilitate the learning process of coordination.
- It is implicit in all circumstances because one does not have to declare beforehand that he is going to comply with a procedure. Participating in coordination becomes sufficient and imposes constraints. The actor must then show that he is prepared to comply with these constraints (Reynaud, 1998).

The implicit commitments are displayed and developed with the interactions, which implies a repetition and successive validations of the relationship thus established. However, in this case, it is the principle of collective action that prevails over face-to-face relations. It is therefore necessary to introduce a third term of collective action. The relation can be written as follows (Torre and Chia, 2001, inspired by Reynaud, 1998):

- Two coordinated actions A and B are necessary in order to carry out a collective action.
- X is uncertain as to whether Y will carry out A, and reciprocally (the same thing applies to any other members of the organisation).

- X participates in the coordinating action in order to limit the uncertainty about his future behaviour and prove his goodwill, and reciprocally (this leads to cooperative behaviours).
- This participation is interpreted as an implicit commitment that will generate trust.

### Explicitly Expressed Intentions of Action and Rules of Organisation

If local organisations rest on explicitly expressed intentions of actions and therefore require a highly formalised organisational dimension, the importance of proximity is very likely to be less pronounced.

It is the case for organisations that depend (partly or completely) on hierarchical confidence, such as organisations of producers regulated by very constraining rules that are not easily interpreted. The spatial dimension existing in this type of organisation (Controlled Designation of Origin, for example) is purely geographical and related to the controlled origin of the product. The producers are united by the formal rules of their organisation and their geographical origin.[9]

The system of power and of rules that are not open to interpretation is sufficient to coordinate the whole, and mistrust seems to prevail over trust. This type of organisation has the advantage of not requiring the actors to share the same anticipations beforehand. Furthermore, in this case, the system's continuity and stability rest primarily on the relationship-building process. However, regardless of the type of organisation, there can never be certainty as to the stability of the actors' behaviour. Opportunistic behaviour or bad faith can lead partners to dishonour their mutual commitments. The relations between the actors develop within this pre-existing framework where the relations of power and constraining rules put pressure on the members. The latter can no longer use their common reference points to coordinate themselves (in particular domestic confidence which can no longer play its role as the cement of the social relationship); coordination takes place through rules.

Everything then depends on how interpretable these rules are. The more interpretable rules are, the more able will the actors be to trust one another. However, in this case, the link between trust and proximity remains weak and is limited to secondary dimensions of the production relation.

## CONCLUSION

In this chapter we have aimed to explain the relationship between two complex concepts, trust and proximity. Given the common argument that

trust is an important factor in determining the advantages possessed by local systems of production (see various other chapters in this volume, for example), such analysis has the potential to yield insights with regard to the operation of successful clusters, which may or may not be spatially proximate in the context of globalisation. After presenting the main characteristics of a trust relationship, we have shown that beyond the standard concept of interpersonal confidence based on face-to-face relations, there is another approach that refers to a concept of community confidence, which is more centred on the ability of individuals to embed themselves in a social system. This convenient distinction makes it possible to understand the dynamics at work within local systems of production. One drawback of these approaches, however, is that they are too highly oversocialised and undersocialised respectively to cover the whole spectrum of relations of proximity, in particular in their productive dimension. The hierarchical confidence concept enables us to go further in this analysis and to reveal the type of relations that emerge in localised organisations. One can then understand why the relation between trust and proximity varies according to the types of confidence mobilised at local level. In systems based on domestic confidence, geographical proximity plays an important role. In those based on hierarchical confidence, commitments are more easily reversible and geographical proximity plays a lesser role.

# NOTES

1. See, for example, reference to trust in the frameworks for analysing clusters developed by Pitelis and Pseiridis (Chapter 2) and Sugden et al. (Chapter 3) in this volume, and also, in the specific contexts of knowledge and of public goods, in the chapters by Henry and Pinch (Chapter 5) and Bellandi (Chapter 4), respectively.
2. This uncertainty can refer to either the intentions or the competence of the other.
3. The chapter by Aranguren et al. in this volume (Chapter 12), for example, highlights the importance of generating confidence among actors in a policy context in the Basque Country region of Spain.
4. This result is very close to those obtained in our simulations with a 'prisoner's dilemma' (Dupuy and Torre, 1998b).
5. The cases presented here are obviously arbitrarily simplified for the sake of analytical simplicity. In reality, more complex situations, associating two or three of these forms, may exist.
6. Geographical proximity, in this particular case. But it can also be organisational proximity in the case of ethnic networks in which the reference to the same origin generates a relation of trust. This is in keeping with Giddens's remarks quoted in the introduction, and a potential implication with reference to clusters, for example, is that different forms of proximity may facilitate the operation of non-spatially bound clusters in the context of globalisation.
7. This is seen, for example, in the experience of 'cluster carriers' in the 'Future of Greek Industry' policy project evaluated by Pitelis and Psieridis in Chapter 2 of this volume, and also in the experience of cluster policy in the Basque region of Spain as analysed by Aranguren et al. in Chapter 12.

8. On industrial relations, see also Quintana and Pulignano in Chapter 9 of this volume.
9. The question of the origin of goods and persons deserves to be further examined, inasmuch as it highlights a connection with a territory. This may concern ethnic or community networks, the 'typical' characteristics of products, or reference to the ethical characteristics of a product (manufactured by children, etc.). For example, in the case of a product whose characteristics are related to its geographical origin, such as Controlled Designation of Origin products or food products, traceability is an important factor and, for this reason, confidence in this type of abstract system or mechanism is important. The connection with the territory might then be a distant or even symbolic relation.

# REFERENCES

Aubert, F. and Sylvestre, J.P. (eds) (2001), *Confiance et Rationalité*, Paris: INRA éditions.

Arrow, K. (1974), *The Limits of Organisation*, New York: W.W. Norton.

Becattini, G. (1992), 'Le district Marshallien: une notion socio-économique', in G. Benko and A. Lipietz (eds), *Les régions qui gagnent*, Paris: PUF.

Braudel, F. (1979), *Civilisation Matérielle, Economie et Capitalisme*, Paris: Armand Colin.

Camagni, R. (1995), 'Espace et temps dans le concept de milieu innovateur', in A. Rallet and A. Torre (eds), *Economie Industrielle et Economie Spatiale*, Paris: Economica.

Dupuy, C. and Torre, A. (1998a), 'Liens de proximité et relations de confiance', in M. Bellet, Th. Kirat and Ch. Largeron-Leteno (eds), *Proximités: Approches Multiformes*, Paris: Hermès.

Dupuy, C. and Torre, A. (1998b), 'Cooperation and trust in spatially clustered firms', in N. Lazaric and E. Lorenz (eds), *Trust and Economic Learning*, Cheltenham: Edward Elgar.

Gambetta, N. (1988), *Trust: Making and Breaking Cooperative Relations*, Oxford: Basil Blackwell.

Granovetter, M. (1978), 'Threshold models of collective behavior', *American Journal of Sociology*, **83**, 1420–43.

Giddens, A. (1994), *Les Conséquences de la Modernité*, Paris: L'Harmattan.

Guennif, S. (2000), 'Incertitude, Confiance et Institution en Échange Marchand: Recherche sur les Fondements de la Confiance et Application au cas de la Sous-Traitance dans le Secteur de la Mécanique de Précision', Thèse de doctorat en Sciences économiques, Paris.

Hansen, N. (1992), 'Competition, trust and reciprocity in the development of innovative regional milieux', *Papers in Regional Science*, **71** (2), 95–105.

Kreps, D.M. (1990), 'Corporate culture and economic theory', in J. Alt and K. Shepsle (eds), *Perspective on Positive Political Economy*, Cambridge: Cambridge University Press.

Krugman, P. (1991), 'Increasing returns and economic geography', *Journal of Political Economy*, **99** (3), 483–99.

Laufer, R. and Orillard, M. (eds) (2000), *La Confiance en Question*, Paris: L'Harmattan.

Lazaric, N. and Lorenz, N. (eds) (1998), *Trust and Economic Learning*, Cheltenham: Edward Elgar.

Luhmann, N. (1979), *Trust and Power*, New York: John Wiley.

Luhmann, N. (1988), 'Familiarity, confidence, trust: problems and alternatives', in D. Gambetta (ed.), *Trust: Making and Breaking Cooperative Relations*, Oxford: Basil Blackwell.

Lyotard, J.F. (1979), *La condition Post-Moderne*, Paris: Ed. de Minuit.

Marshall, A. (1898), *Principles of Economics*, London: Macmillan.

Mayer, R.C., Davis, J.H. and David Schoorman, F. (1995), 'An integrative model of organizational trust', *Academy of Management Review*, **20** (3), 709–34.

Nooteboom, B. (2002), *Trust. Forms, Foundations, Functions, Failures and Figures*, Cheltenham, UK and Northampton, MA, USA: Edward Elgar.

Orléan, A. (1994), 'Sur le rôle respectif de la confiance et de l'intérêt dans la constitution de l'ordre marchand', *Revue du Mauss*, **4**, 17–36.

Reynaud, B. (1998), 'Les conditions de la confiance. Réflexion à partir du rapport salariat', *Revue Economique*, **49** (6), 1455–71.

Servet, J.M. (1994), 'Paroles données: le lien de confiance', *Revue du Mauss*, **4**, 37–56.

Storper, M. (1995), 'La géographie des conventions: proximité territoriale, interdépendances non-marchandes at dévelopment économique', in A. Rallet and A. Torre (eds), *Economie Industrielle et Economie Spatiale*, Paris: Economica.

Torre, A. (2000), 'Faut-il avoir confiance dans les techniques de production de la confiance? Liens de proximité et stratégies des acteurs', in R. Laufer and M. Orillard, *La Confiance en Question*, Paris: L'Harmattan.

Torre, A. and Chia, E. (2001), 'Le pilotage d'une AOC par la confiance', *Gérer & Comprendre*, **65**, September, 55–68.

Weber, L.R. and Carter, A.I. (2003), *The Social Construction of Trust*, New York: Kluwer.

# 9. Clustering of productive activities: a terrain for employment relations

**Miriam Quintana and Valeria Pulignano**

## 1. INTRODUCTION

In parallel with the study of globalisation, local systems of production have received considerable attention over recent decades. The study of local economies as alternative systems of production was notoriously fuelled following a period of recession and stagnation in the major world economies towards the end of the 1970s and during the 1980s. Places such as the centre and north parts of Italy, Baden-Württemberg in Germany and Silicon Valley in North America emerged as economic centres characterised by their superior performance and by firms with a particular role as flexible and efficient entities. Studies in this area have drawn attention to a mode of decentralised cooperative production popularised as flexible specialisation. Moreover, despite the disparity found in their specific features and locations, common elements such as locally owned firms, highly flexible workforces in a local labour market context, and shared locally provided services in technical expertise (Piore and Sabel, 1984) have led to this type of system being studied as a model for the promotion of geographical areas. Indeed, it can be argued that the combination of high rates of economic growth and international competitiveness, which are thought to be associated with local cooperation, territorial agglomeration effects and flexible forms of production, make such systems attractive models of industrial organisation for the future. In particular, such thoughts break with previously established functional and territorial divisions of labour, with the concept of geographical proximity becoming as, if not more, important.

A number of terms have been used in relation to the study of local systems of production, such as 'learning regions' (Morgan, 1997), 'new industrial spaces' (Scott, 1998) or, most famously, 'industrial districts' (Marshall, 1919).[1] While acknowledging the wide range of definitions around the concept of clusters of firms, for the purposes of this contribution we follow Porter's (1998) general definition of a 'cluster' as a geographic

concentration of interconnected companies and institutions in a particular field. Accordingly, a cluster is an alternative way of organising the value chain that lies between arm's-length markets and vertical integration. Thus, networks create conditions whereby small and medium-sized firms have been able to compete successfully in national and international markets. The economic success of clusters has been assessed and generally attributed to the geographical proximity of the firms and the social advantage of their location. In particular, geographical proximity is said to be a key base for the development of trust and cooperation, analysed in detail by Dupuy and Torre in this volume (Chapter 8). In turn, these are considered to be essential social and organisational factors for the sustainability of the specific organisational forms of firm clusters.

Most of the research on clusters of firms has focused on analysing how these agglomerations, guided by the principle of cooperation, can be a resource for economic competitiveness, a topic that is analysed in detail by Pitelis and Pseiridis in Chapter 2 of this volume. Traditionally, the disadvantage of smaller firms in competing in national and international markets has been their isolation. Clusters, as new organisational forms and industrial contexts based on well-developed networks and communication structures, provide smaller firms with a more supportive context in which to exercise their flexibility and gain comparative advantage in wider markets.

Very little attention, however, has been paid to the nature and extent of formalisation and regulation of the employment relationship within clusters, and the extent to which such relations are an element in, if not an important determinant for, the success of firm clusters. The dynamics surrounding the nature of the employment relationship can indeed be expected to be very important for the success of firms that are highly dependent on the social context in which they are embedded. In the few exceptions where reference has been made to labour conditions and work practices within clusters of firms, diverging views have been expressed. Amin and Robins (1992) draw attention to cases where development has been achieved at the expense of low salaries and non-skilled workers, whereas Trigilia (1992) makes reference to districts with high labour standards and salaries. These different realities suggest that there is probably more to the common argument that informal relations are at the base of regulating social and economic activities within industrial districts. In the context of labour relations such a statement needs to be further investigated. Indeed, as Streeck (1993) notes, there is little account of how work standards, where good, have been set and maintained within the context of industrial districts, for example.

In this chapter we attempt to address this gap by stressing the importance of the nature of the employment relationship, which can be very place-specific, and in doing so highlighting different realities and experiences of

clustering activities. In particular we draw from a case study in the motor manufacturing sector in Italy to illustrate how clustering of production activities around the disintegration of large firms and the emergence of 'supply network parks' has potential implications for employment relations and opens up a new agenda for the actors involved. The introduction of new management practices at the Fiat car plant in Melfi at the beginning of the 1990s led to just-in-time delivery and production by partnership suppliers becoming a relevant issue. As a result, reflection on the impact of those practices for employment relations was needed. The case illustrates that harmonious employment conditions and consultation between management and labour proved to be crucial to guarantee organisational efficiency and social peace among the diverse firms of the cluster.

The chapter is structured as follows. Section 2 presents a selective discussion of the literature surrounding clusters, drawing out particular issues concerning the employment relations within such clusters. Section 3 continues the discussion by widening its remit to consider situations where small and medium firms cluster around a large leading firm. Section 4 then draws on a specific case study to illustrate the importance of certain employment and industrial relations aspects (such as collective bargaining and systems of employee representation). Finally, we draw conclusions in Section 5.

## 2. SMALL AND MEDIUM FIRM CLUSTERS AND EMPLOYMENT RELATIONS

The international interest in clusters formed by small and medium-sized enterprises (SMEs) initially emerged from the experiences of what has been termed by Bagnasco (1974) the 'Third Italy' (*Terza Italia*). This concept started to be used in Italy in the late 1970s and became associated with the more traditional concept of 'industrial districts'. In certain sectors such as textiles, leather and furniture, in the central and north-eastern parts of Italy, where SMEs were the norm, groups of firms developed links and collaboration agreements of certain kinds.

It is reasonable to think that size and other firm-level organisational features influence the type of employment relations to be found in a firm, which implies differences in the employment relations between SMEs on one hand, and larger firms on the other. Research on the employment relationship has generally concentrated on large firms, but the last two decades or so have seen the emergence of studies on the subject of SMEs (Goss, 1991; Rainnie, 1989; Wilkinson, 1999). Whereas we would not suggest that there are homogeneous employment relations practices across SMEs, and indeed variation in the employment relationship within SMEs has been

indicated by various studies in the field (Storey, 1994; Goss, 1991), certain patterns have been identified which distinguish employment relations in SMEs from those in larger firms.

Differences occur in particular because the size of small firms often implies scarcity of resources, including money and people. This tends to be associated with the non-existence of a personnel department and lack of well-developed human resource practices, and with no union recognition or a lack of union members and collective bargaining tradition (Storey, 1994). These features reflect a recurrent feature often mentioned in the literature on SMEs, which is the existence of a family-type culture, which substitutes a procedural-type system for a more personal-based relation underlying the employment relationship. In line with this, workers in industrial district labour markets, and more generally in SMEs, are believed to have more opportunity for face-to-face discussion with their employers than those in larger organisations (Roberts et al., 1992). In particular, family-run firms have traditionally been associated with a closer and more amicable employee–employer working relationship, given proximity and more flexible communication arrangements, a view that has often been put forward in explaining the positive experiences of the traditional types of clustering activities with regard to the labour–management relationship. Indeed, the multiple connections between production activity and day-to-day life potentially widen the scope of the labour market from that based only on formal work contracts.

Taking the analysis further in linking it with skill levels, Dei Ottati (2003, p. 192) argues that a, if not the most, significant consequence of the intermingling of productive and social relations relates to knowledge production and learning. In other words, a significant amount of on-the-job training and interaction through lack of social barriers is done in districts as compared with more standard models of production in larger firms. Given that skills levels are an important determinant of the capacity of employees to move between firms, it can be argued that higher skill levels among district workers make them less dependent on the employer, even if they should still be subject to the constraints of limited geographical mobility. The combination of stronger social interaction and lower dependence on the employer can be argued to lower the need for the existence of more formal relationships embedded in trade unions, again a recurrent feature of traditional districts literature.

Typologies of industrial districts have flourished as the study of these forms of economic organisation progressively gained in relevance. Brusco (1992), for example, distinguishes four main categories, namely the 'artisan' model, the 'dependent subcontractor' model, the 'industrial district Mark I' model, and the 'industrial district Mark II' model, which follow

developments around small firms in Italy over the last 50 years.[2] Likewise Perry (1999) differentiates between two types of industrial districts. The first type concerns the traditional clusters, which date from Italy's first industrialisation and includes examples such as the wool and silk industries.[3] Given their collective reputation, their localities are recognised as places of industry leadership resulting in a common marketing image from which they benefit as a whole. The second type are the districts which emerged in the 1950s and 1960s as the result of a relatively free context of foreign competition due to their perceived limited opportunities for technological developments (Perry, 2001, p. 93). In the latter, firms are capital-intensive and small in terms of employment. The firms' advantages are their individual product leadership and limited inter-firm cooperation despite their geographical concentration.

As the attempts to categorise suggest, literature on the traditional type of industrial districts embraces perhaps more varied experiences than are often considered when referring to industrial districts as a 'single' concept. In practice, different districts each have their own features and peculiarities. It is reasonable, therefore, to think that similar variation can be found in terms of the nature and dynamics of employment relations found within districts. For example, in contrast with the situation of amicable employment relations presented earlier, Brusco (1990) has noted that because of the informal and paternalistic nature of employer–employee relations within clusters of SMEs, the system of employment relations has developed outside a regulatory framework. Such a framework could in principle have protected workers from facing disadvantages such as differences in wages and working conditions compared to larger firms. Thus it has been suggested that those apparently informal ways to run employment relations in SMEs might not always result in benefits for workers, with informality covering more abusive employment relations below the surface (Rainnie, 1989). This view has contributed to the labelling of employment relations in SMEs as paternalistic and authoritarian (Wray, 1996). Brutti and Calistri (1990), for example, are alert to cases of breaches of labour contracts, poor labour conditions and the use (or misuse) of flexible forms of employment in SME clusters. Similarly, Amin and Robins (1992) maintain that in some districts, development might have been based on the provision of cheap rather than highly skilled labour.

Indeed, from the scarce evidence available there seem to be divergent views and realities about the nature and 'quality' of the employment relationship in industrial districts. Moreover, the variety found within industrial districts can be extended to the wider concept of firm clusters, where no doubt ample variation can also be expected, especially given the wide range of phenomena that are often labelled as clusters.[4] This, we argue, is an

aspect which needs to be further examined, both with regard to factors related to the firms themselves, and to the wider context in which firms are embedded, and which contributes to shaping the different outcomes in terms of employment relations.

In searching for potential factors shaping differing employment relations in clusters of firms, some hypotheses have been advanced. For example, Graziani, cited in Brusco (1990, p. 11), points to factors relating to location and firm size in order to explain differences found among firms existing in the Italian cluster context. Location was found relevant in explaining the dualism found between Northern Italy, more open to foreign competition (which in turn facilitated investment, efficiency, unionisation and high wages), and Southern Italy, where firms are more locally or nationally oriented (with a subsequent stifling effect on investment, technology, unionisation and wages, which remained low). The firm size and end market also appear relevant in helping to shape employment relations. In what Graziani (1972) calls the 'dependent subcontractor' model, the core labour in larger firms is surrounded by a periphery of smaller firms whose employment conditions were based on low wages, bad conditions of work, and lack of mobility and career prospects. This is argued to be a result of strong competition between the small firms, which, although indirectly, are producing for the national or international markets which the leading firm serves.

A further observation relates to the presence and role of organised labour, namely trade unions, in the experiences of firm clusters. As discussed earlier, literature on industrial districts has tended to omit issues around the nature and type of employment relations, in the belief that informal, family-oriented and paternalistic types of practices prevail. Part of this approach can be associated with the widespread omission of organised labour in the industrial district literature and more generally in cluster studies, in particular with reference to the role of trade unions at company level. Little attention has, for example, been paid to the extent to which unions have contributed to the establishment and/or maintenance of existing labour and working standards within firms. While non-union presence in smaller firms is definitely more abundant than in those of larger size, it is also true that in certain national contexts low unionisation levels are not necessarily a sign of lack of union strength. Union membership and presence at firm level is usually low (with variations between sectors) in Southern European countries when compared to those of their Central and Northern counterparts, but unions in these countries are more institutionally engrained, with higher dialogue power at higher institutional levels. Thus it is reasonable to argue that unions might have played a larger role than is commonly assumed in employment relations practices in clusters.

Reference has indeed been made in the relevant literature to trade unions as organisations whose role within the community and specifically within clusters of firms has been mainly that of providing particular services for the firms, perhaps the most common being research and development, or training and education. However, possibly more important is their role within the local concertation, the dialogue between employer associations and worker associations, which is often central to the formation and maintenance of firm clusters. This is related to what Dei Ottati (2003, p. 195) calls 'political-associative regulation', the dialogue and 'bargaining' that take place between different interest groups in the locality (one of them being trade unions or their softer forms of 'artisan associations' etc.) to maintain the competitiveness of local industry based on what are essentially cooperative employer–employee relations.

The institutional and regulatory framework must not indeed be underestimated in determining the governance of employment relations within firm clusters, and it is arguably the most important factor. Indeed the factors already mentioned will often take a different dimension depending on the institutional conditions of the place in which the cluster is located. Conversely, institutional conditions will vary according to some of the factors mentioned earlier, such as firm size; that is, institutional conditions might be different for small or larger firms as certain elements of policy making are tailored to differences in size. For example, elements influencing the employment relationship, such as wage determination systems where they exist, tend to differ. They are usually more regulated in larger firms than in smaller firms.

More generally, the institutional and regulatory framework can be defined at a number of levels – country, region and locality are the most important ones – but often with cross-dependencies among them.[5] Glassmann and Voelzhow (2001, p. 214), for example, report on Germany where co-determination rights are reflected in the clustering experiences in the German context. Also within Germany, initiatives from the state in terms of continuous training and so on have helped to shape the operation of the craft sector where small and medium firms cluster. In France, however, the lack of collective agreements and more flexible labour policies are reflected in the firm clusters of that country (Amadieu, 1992, p. 115). Another dimension of the regulatory framework is the sectoral level, which can introduce considerable variation within and across the geographical levels mentioned above. For example, while it is acknowledged that salary differences tend to exist between different firm sizes, this gap is lower in firms located in Germany and some Northern European countries where collective agreements at sector level cover all employees within that

particular sector (Weimer, 1992, p. 142). In turn this will influence the wages of workers in firm clusters if these fall within a regulated sector.

The above discussion illustrates that the circumstances determining employment relations within a firm and indeed firm clusters is complex and can be shaped by a wide range of factors, some of which have been explicitly addressed. In particular the location of the cluster being analysed, determining its employment relations context, is likely to be crucial. Additionally, what has often been missing from cluster analysis is the role of leading larger firms (Cantwell, 2001), a presence that can potentially interact strongly with employment relations practices of the surrounding smaller firms. The next section seeks to address this issue.

## 3. 'DEPENDENT'-TYPE CLUSTERS AND EMPLOYMENT RELATIONS: EXAMINING SUPPLY NETWORK RELATIONSHIPS

The introduction of new management practices since the mid-1980s in line with time- and quality-related production methods such as 'just-in-time' (JIT) and 'total quality management' (TQM), particularly in the manufacturing sector, has raised awareness around the implications for those supplying firms that cluster around leading firms. As a result the study of supply chains has received significant attention, emerging as a specific discipline within the management field. Within the so-called 'supply chain management literature', Croom et al. (2000) have developed an interesting framework to analyse supply management according to two dimensions: the content matrix defined by the level of analysis (dyadic, chain, network); and the element of exchange considered (assets, information, knowledge and relationships). In starting by distinguishing supply relationships between level of market and level of individual organisation, and in so doing recalling Coase's (1937) and Williamson's (1975) theoretical assumptions on transaction cost economics, the authors maintain that supply chain organisational relationships are arguably the most important element of an exchange relation since they are the effective keys for management of material, information and knowledge flows. Moreover, examining supply chains in terms of organisation basically implies looking at supplier–customer relationships as 'partnerships' within the supply network. In addition, analysis of supply networks has also focused on the logistical aspects of inter-firm relations, and within this the concept of 'supply chain' has been examined from a variety of perspectives and bodies of knowledge. These include, for example, strategic management (supply network design,

strategic alliances, strategic purchasing), logistics (JIT, planning and control of material and information flows), marketing (Internet supply chains), relationships and partnerships (supplier involvement, pragmatic collaboration, partnership performance, vertical disintegration), and organisational behaviour (knowledge transfer, organisational learning).

Despite the growing importance of supply chain management and a growing literature addressing various issues surrounding in particular the organisational aspects of supply network relationships, there is very little exploration of the impact of those relationships within the individual organisations themselves. As Saunders (1995), cited in Croom et al. (2000, p. 68), argues, while there is little clarity concerning the remit and definitional constructs of 'supply chain management', most definitions concur in that 'they focus on the external environment of an organisation, with the boundaries of the latter defined conventionally in terms of an entity identified legally as a company or some other form of business unit'. From an industrial relations perspective, it might be argued that this lack of focus on the internal organisation and dynamics of the firm is associated with weak attention to the analysis of the impact of supply networks, and changes in production networks as the result of the introduction of the new management strategies, on employment and industrial relations within those firms. It is in this aspect that our interest lies.

Given the central importance attributed to the study of human resources by the new management practices in organisations, the weak attention to employment and industrial relations elements is perhaps surprising. This is even more so given that the desire to establish different forms of production networks has often been developed explicitly in the context of the implementation of new management practices. Again, for these to be successful, effective employment and industrial relations are a key consideration. This has been partly addressed by some studies which have examined the importance of the human resource factor within new management practices (Scarbrough, 2000; Carter et al., 2001; McAfee et al., 2002). Thus, moves towards the JIT or TQM philosophies have been particularly associated with the introduction of innovative working methods such as team-working arrangements which are directly related to the firm's workforce and the nature of the employment relationship. In other words, changes in work organisation and human resource practices become key to building the necessary internal infrastructure in which to support the relationships to be developed within (and among) firms of the supply network. In this sense, the supply chain generates important demands on the firm in securing the necessary skills, levels of flexibility and employee commitment to support greater levels of cross-firm integration.

In contrast to the 'partnership'-oriented approach, which sees as key the two-way benefits resulting from greater levels of integration between firms, research on the implications of supply networks for human resource management has emphasised the unbalanced and exploitative nature of leading firm–supplier relationships. They have therefore analysed the fragmented effects on the labour force of the leading firm ('core') and the suppliers ('periphery') (Rainnie, 1991; Turnbull et al., 1993). This is explained with reference to the dependent nature of power relations between large 'leading' firms and smaller 'depending' suppliers, something that might suggest a unilateral or 'top–down' approach to decision making between the leading firm and the suppliers within the supply network which would enduringly favour the more powerful leading firm.[6]

However, as Hunter et al. (1996) argue, if we use the organisational approach to characterise a dependent supply-based framework, then the relation between the large and the small firms might be defined within a 'partnership' context where both the larger and the smaller firms are having to reshape their existence. This is due to the introduction of new requirements involving the organisation of production as new ways of delivery such as JIT are introduced. In doing so there is a move away from a situation dominated by clearly defined lines of power along the supply network to one where those lines are blurred by the emergence of an interdependent set of structures and activities. Collectively such structures and activities play a key role in shaping and creating new forms of inter-organisational networks and relationships where power can be more a matter of subtle interplay than conscious and explicit coercion. A key question, therefore, is what are the implications of more interdependent systems of inter-firm organisation for employment relations within the supplier firms? How do workers and managers interact within these networks and how do worker representatives respond to the introduction of new management methods?

It is reasonable to assume that these implications may be shaped by the culture and history of the firms involved in the network and also by the context in which they are embedded. Moreover, as Kochan et al. (1997) argue, the nature of the industry itself may encourage evolution towards such forms of networks and favour a systematisation of employment relations effects. A case study on the network of supplier firms at the Fiat car plant in Melfi follows, and analysis of the dynamics which concur to regulate employment relations in such a context illustrates that the presence of interdependent supplier–customer relationships under the JIT system had an impact. In particular, the vulnerability that is implied by inter-firm dependence has entailed management in both the leading and supplier firms to accommodate management–labour relations, and thereby to shape the emergence of a regulatory framework for employment relations at Melfi.

# 4. THE RELEVANCE OF EMPLOYMENT RELATIONS FOR SUPPLY RELATIONSHIPS: THE CASE OF FIAT IN ITALY[7]

## Dependent Inter-firm Relations within a 'Supply Network'

At the end of the 1980s Fiat-Auto realised that the defensive strategy with which it approached the 1970s – reducing conflict by making production less dependent on labour as the result of the introduction of automation and also by moving production to other sites – had ceased to be the best means to achieve high levels of product quality and productivity. It became necessary therefore to combine the highly automated and the externalisation solution with new patterns of production organisation by taking into account the available evidence on work reorganisation and restructuring practices.

The reorganisation programme became the focus of a whole restructuring project, labelled 'Total Quality' and based on JIT and lean production techniques. In order to understand its rationale it is necessary to focus attention on the project: the 'Integrated Factory' (Fabbrica Integrata or IF). A comprehensive implementation of the IF programme was achieved only with the development of two new plants at Melfi and Pratola Serra in Italy. At Melfi a total of around $200 million was invested, with a planned production of 450 000 cars per year (1600 per day). The plant opened in 1993 on a greenfield site and was presented by Fiat as a major development in vehicle assembly. Local government financial backing enabled Fiat to move to one of the depressed regions in Southern Italy with a labour market characterised by a high rate of unemployment and a highly educated young workforce. Site employment was 6500 employees overall (car maker and supply chain), with an average of 30 per cent female workforce composition. In the integrated production system considerable attention has been paid to the role of the supply chain in the management of production. In the plant a revolutionary change took place as suppliers were brought into the supply park (called *comprensorio*) adjacent to the assembly plant. Here, their role was transformed into one of integrated supplier with involvement in the day-to-day supply of their components into the assembly process, according to the JIT principle. This contributed to enhancing the reciprocal dependence of suppliers to the car manufacturer as a result of the just-in-time principle, which requires components to be delivered to the assembly line at the exact time they are required by the customer. Accordingly, cost reduction is guaranteed through the cutback of buffers, while the risk of delivery problems becomes higher within the car manufacturer as the result of the absence of stocks.

In the *comprensorio* 20 first-tier and two second-tier suppliers were located, employing around 3000 employees. Most of the suppliers transferred their production from Northern to Southern Italy. They are auto-component firms, delivering 43 per cent of the car value and producing a range of electronic, chemical/plastic and manufacturing products. Moreover, they were directly involved in the construction of the new installation and contributed around $20 million of the initial $200 million invested in the plant. The ownership of the subcontracting firms inside the *comprensorio* is formally independent from Fiat, although such independence is nominal at Melfi since the system of production is still governed by the customer to whom suppliers dedicate their entire production. Suppliers have an average union density of 30 per cent, with the Italian trade union national federations in the metalworking sector FIM (Federazione Italiana Metallurgici) and FIOM (Federazione Impiegati Operai Metallurgici) constituting the largest union presence. In 1998 the UGL (ex-CISNAL) also established a presence, in addition to UILM (Unione Italiana dei Lavoratori Metallurgici), and FISMIC, a company union following the company's lead on all matters.

While operating the integrated production system with the suppliers, Fiat was aware that disparities in terms and conditions of employment in labour regulations might induce competition among employees doing the same job, to the detriment of cooperation, and in turn generate disputes and disrupt production. This aspect seems to be a country-based element, which is peculiar to the Italian situation since international evidence shows that disparities in wage contracts among the different enterprises clustered by the customer's production unit, and delivering JIT, have in fact become a distinctive feature in other countries. For instance, the Volkswagen truck and bus plant at Resende (Brazil) and the Renault car plant at Blainville (France), which both represent some of the most advanced examples of implementation of outsourcing practices in motor manufacturing, have adopted a system mainly based on the differentiation of wage levels and employment benefits leading to a reduction in labour costs. In contrast, the notion of 'harmonisation' seems to be a powerful one in the analysis of the nature of the relation between JIT and employment relations at the Melfi factory.

## Regulating Employment Relations in the 'Supply Network'

The harmonisation of employment relations across the suppliers at Melfi involved the carmaker in the development of innovative partnership deals, which provided for a participatory approach to cross-company employment relations. This approach was extended only to the 22 enterprises located in

the supply park (*comprensorio*), delivering components to the Melfi plant. As a consequence of the harmonisation process, wage levels and social benefits already established for Fiat's employees were extended to suppliers' employees clustered in the *comprensorio* and involving the consortium of ACM employers (Consorzio Auto Componentistica del Mezzogiorno). The consortium is an institution representing the employers of the *comprensorio* in negotiating with the three main trade unions federations in the metalworking sectors (CIGIL, CISL and UIL) over working conditions, wages, health and safety, working time, and vocational training with the union local federations.

The adoption of the harmonisation procedures was negotiated through local-level bargaining with the unions. Thus it is at this territorial level that the entire system of industrial relations has been carried out. This is an important change as opposed to the previous bargaining system in Fiat, which was focused upon the industry level. Indeed, the decentralised level of bargaining, whether at the company or territorial level, is emerging as the most appropriate arena for confronting processes of reorganisation and restructuring within Italian motor manufacturing. Nevertheless, the primacy of the industry level still persists and will not diminish in the foreseeable future, partly because of an explicit strategy of the unions, which believe it important to preserve institutions that prevent the excessive differentiation of employment conditions. As Katz and Darbishire (2000, p. 250) point out, Italian management and national unions in the metalworking sector have always searched for a bargaining structure that would maintain 'an effective degree of coordination across various levels and avoid the instability and disorganisation that might appear in a more free-for-all decentralised bargaining structure'.

The rules and the procedures involved in industrial relations at Melfi are set by two local agreements: the July 1994 and the May 1998 agreements between the ACM consortium and the metalworking union federations. The rationale is to integrate production organisation more closely between Fiat and the suppliers as a consequence of the introduction of JIT. The outcome is the extension of the effects of the integration in production to the regulation of capital–labour relations. In line with that, the July 1994 agreement recommended harmonising working conditions between Fiat and (among) the suppliers with regard to wages, working time, working hours, training and overtime. In particular, pay was homogenised across different sectors by considering the diverse firms' activities. Wages and any additional element of pay, such as the level of premium or performance assessment to be paid to nightshift and holiday workers, were harmonised. The system of awarding employees the so-called 'competitiveness bonus' as a result of the introduction of a performance-related pay system was also extended to

non-Fiat employees. This bonus provides for an additional annual payment to workers on the basis of plant and individual factors such as the level of productivity, absenteeism, overtime and so on.

The harmonisation of wage bargaining and social benefits was primarily aimed at reducing disputes at work, while the homogeneity of working time was seen as a means of establishing seven days per week on the basis of three shifts (including the nightshift). However, the agreement stipulates that working hours can further be regulated at individual company level. Further, all workers employed on combined work and training contracts will be regarded as permanent employees after three years' full employment, irrespective of the length of the original training contract. Both employers' organisations and trade union associations recognised the importance of training strategy and have therefore agreed to establish a procedure to provide workers with information and training opportunities within the consortium companies.

With regard to union rights, the 1998 agreement introduced a representative participation system through joint consultation committees, including those between union representatives and management. The rationale behind the agreement is to 'enhance the value of human resources, increase the opportunity for dialogue between union representatives and employers and reduce the possibility for conflict by anticipating and addressing problems of common interests in a constructive manner' (*Accord*, May 1998, p. 1), so that losses in production are minimised and JIT is enforced. To achieve that, bipartite bodies for a participatory model of employment relations were provided, consisting of a consultative body, inter-company committee, integrated plant-level commission and committees for the environment and health and safety. The consultative body informs workers' representatives of its deliberations and keeps them up to date on the development and progress of the participatory model and the resolution of social problems that could have a general impact on the working conditions of the employees in the *comprensorio.* The inter-company committee's main role is to encourage positive social dialogue and examine training provisions and monitoring measures aimed at preventing workplace accidents. Membership of the committees comprises, on the employers' side, representatives of the ACM consortium and individual company concerned, and, on the union side, one local union representative for each union. Finally, a committee for the environment and health and safety is established within each production unit. Its main role is organising training programmes to alert workers to the health and safety aspects of their work and any potential risks resulting from technological change, and informing employees of the cause of workplace accidents.

Overall, inter-company committees and integrated plant-level commissions were established to prevent potential industrial conflicts and encourage positive 'social dialogue'. Their main role is to examine employment and social production problems at the committee level, monitor the functioning of the production system and elaborate measures aimed at preventing workplace accidents for the smooth realisation of JIT. In this respect, the new industrial relations system at Melfi enables employers to emphasise worker flexibility through working time and the performance-related pay system, and more cooperative relations with unions, including 'no-strike' agreements and introducing bipartite bodies providing cross-company employee relations.

Coordination of employment issues in the industrial condominium is thus the result of formal bargaining through negotiation with the unions and management–labour joint regulation. The partnership-based union approach incorporates a belief that the new workplace agendas hold the prospect of forging common interests and cooperation between management and labour around issues such as health and safety and working time (Bogetti and Erliker, 1998). None the less, it is difficult, perhaps utopian, to believe that traditional 'structured antagonism' (Edwards, 1986) or 'conflict of interests' (Kelly, 1998) between employers and labour can simply be dissolved through discussion. The empirical evidence suggests that social partnership may be problematic because of the many points of discussion related to multi-tasking, job rotation and extended working hours as part of the new workplace agenda. This continues to reflect the nature of 'compromise' underlying social dialogue, according to which 'partnership cannot dissolve fundamental differences of interest and objective' (Hyman, 2001, p. 56). This is undermined by the evidence presented by most local union leaders in this case study who in many ways highlighted the inherent tensions of 'social dialogue' such as the lack of transparency in management–labour relations. The Fiat case study at Melfi illustrates that interdependent integration within a supply park includes and does not exclude employment and industrial relations arrangements. These are logically connected to organisational changes following the implementation of just-in-time.

## 5. CONCLUSION

Our analysis in this chapter, in line with various other chapters in the volume, has suggested that it is incorrect to think in terms of a single model of 'industrial district' or 'cluster'. This is also supported, for example, by Whitford (2001, p. 40), who, in his analysis of the restructuring of Italian industrial districts in the 1990s, argues that 'a changing external economic

context coupled with different districts' quite variant evolutionary trajectories has led some analysts … to argue that, while the districts literature has taught us something, it is time to move on, refocusing attention on the strategic capacities of the firms in the district'. Over time, districts and, more generally, clusters evolve, and the organisation of these forms of economic production is often shaped by a diversity of institutional arrangements around them. What is often missing in explaining the success and failure of a diverse range of clustering activities is a deeper analysis of labour and employment relations within and among firm clusters, a factor that we argue is highly influenced by the local, regional and/or national institutional arrangements in which the cluster is embedded.

A number of factors emerge from our analysis with regard to the potential significance of employment relations factors within clusters. We focus in particular on the importance of 'interdependence' within the 'dependent' dimension of clusters, and its social implications for employment relations. Our case of Fiat has provided evidence on these issues, and has shown that the emergence of new management practices within a global economic framework leads firms in the supply network to focus attention on the employment and industrial relations dimension in order to regulate human resources as the key factor shaping the new factory regime and cluster competitiveness. Key reasons explaining firms' willingness to engage in 'interdependence' and mutual collaboration around developing common employment strategies are twofold. First is the maintenance of workplace social relations, which aims at facilitating the implementation of the new management practices. This aspect is closely interlinked with issues around the history and culture of the firm and more broadly the institutional and regulatory framework in which firms are embedded. Second is the transfer of best practices and benchmarking activity across firms realising the possibility to use the employment rules as reference points to develop company policy.

In this case, the maintenance of workplace social relations and mutually beneficial collaboration among the firms is closely interlinked to the wider Italian institutional and regulatory framework, in particular in terms of the regulation of employment relations and the industrial relations system. While this does not exclude the importance of the sector, industry and firm history, it does suggest that the national employment relations context can have a strong impact on the development of employment relations in clusters. More broadly, in view of the analysis conducted in previous sections, it appears that further attention needs to be paid to labour and its social aspects in order to understand the complexities and the transformation surrounding the nature of clusters' activities.

# NOTES

1. Various other chapters in this volume discuss in further detail the different definitions of cluster that are in use. See, in particular, the chapters by Bellandi (Chapter 4), Henry and Pinch (Chapter 5) and Di Tommaso et al. (Chapter 13).
2. See also the chapter in this volume by Parrilli (Chapter 10), which establishes a methodological approach to cluster analysis based on a transformation of Brusco's categorisation into a sequence of 'stages' through which industrial districts are argued to pass on their trajectory of growth.
3. Sacchetti and Tomlinson in this volume (Chapter 11) provide a detailed case discussion of the Prato textile industrial district.
4. See, for example, discussion in Bellandi (Chapter 4) and Sugden et al. (Chapter 3) in this volume.
5. The chapter by Gilly and Perrat in this volume (Chapter 7) analyses the more general institutional dynamics at work within and across different territorial scales.
6. See also Chapter 3 by Sugden et al., where the authors suggest the need for a specific governance focus to the analysis of clusters.
7. A version of this analysis is contained in Pulignano (2002).

# REFERENCES

Amadieu, J.R. (1992), 'Francia', in W. Sengenberger, G.W. Loveman and M.J. Piore (eds), *Los Distritos Industriales y las Pequeñas Empresas II. El Resurgimiento de la Pequeña Empresa*, Madrid: Ministerio de Trabajo y Seguridad Social, pp. 89–130.

Amin, A. and Robins, K. (1992), 'Distritos industriales y desarrollo regional: limites y posibilidades', in F. Pyke, G. Becattini and W. Segenberger (eds), *Los Distritos Industriales y las Pequeñas Empresas I: Distritos industriales y cooperación Inter.-empresarial en Italia*, Madrid: Ministerio de Trabajo y Seguridad Social.

Auto Componentistica del Mezzogiorno (1998), Accordo Auto Componentistica del Mezzogiorno, May.

Bagnasco, A. (1974), *La terza Italia*, Milano: Angeli.

Bogetti, M. and Erliker, L. (1998), 'La progettazione formativa per lo stabilimento della Fiat-Sata a Melfi', Participation and Joint Training in European Automobile Industry: Trade Union-Enterprise Committee, Progetto Leonardo.

Brusco, S. (1990), 'The idea of the industrial district: its genesis', in F. Pyke, G. Becattini and W. Sengenberger (eds), *Industrial Districts and Inter-Firm Cooperation in Italy*, Geneva: International Institute for Labour Studies.

Brusco, S. (1992). 'Small firms and the provision of real services', in F. Pyke and W. Sengenberger (eds), *Industrial Districts and Local Economic Regeneration*, Geneva: International Institute for Labour Studies.

Brutti, P. and Calistri, F. (1990), 'Industrial districts and the unions', in F. Pyke, G. Becattini and W. Sengenberger (eds), *Industrial Districts and Inter-firm Cooperation in Italy*, Geneva: International Institute for Labour Studies.

Cantwell, J. (2001), 'Foreword', in P. Guerrieri, S. Iammarino and C. Pietrobelli (eds), *The Global Challenge to Industrial Districts: Small and Medium Sized Enterprises in Italy and Taiwan*, Cheltenham: Edward Elgar.

Carter, C., Mueller, F. and Swan, J. (2001), Social capital and the role of HR practices in the management of knowledge', Conversations and critiques, managing knowledge conference, April, University of Leicester.

Coase, R.H. (1937), 'The nature of the firm', *Economica*, **4**, 396–405.

Croom, S., Romano, P. and Giannakis, M. (2000), 'Supply chain management: an analytical framework for critical literature review', *European Journal of Purchasing and Supply Management*, **6**, 67–83.

Dei Ottati, G. (2003), 'Local governance and industrial districts' competitive advantage', in G. Becattini, M. Bellandi, G. Dei Ottati and F. Sforzi (eds), *From Industrial Districts to Local Development: An Itinerary of Research*, Cheltenham: Edward Elgar, pp. 184–209.

Edwards, P.K. (1986), *Conflict at Work*, Oxford: Blackwell.

Glassmann, U. and Voelzkow, H. (2001), 'The governance of local economies in Germany, in P. Le Gales, C. Trigilia, H. Voelzhow and C. Crouch (eds), *Local Production Systems in Europe: Rise or Demise?*, Oxford: Oxford University Press.

Goss, D. (1991), *Small Business and Society*, London: Routledge.

Graziani, A. (1972), *L'Economia Italiana: 1945–1970*, Bologna: Il Mulino.

Hunter, L.C., Beaumont, P.B. and Sinclair, D. (1996), 'A partnership route to human resource management', *Journal of Management Studies*, **33** (2), 235–57.

Hyman, R. (2001), 'Some problems of partnership and dilemmas of dialogue', in C. Kjaergaard and S. Westphalen (eds), *From Collective Bargaining to Social Partnership: New Roles of the Social Partners in Europe*, Copenhagen: The Copenhagen Centre.

Katz, H. and Darbishire, O. (2000), *Converging Divergences: Worldwide Changes in Employment Systems*, Ithaca, NY: Cornell University Press.

Kelly, J. (1998), *Rethinking Industrial Relations: Mobilisation, Collectivism and Long Waves*, London: Routledge.

Kochan, T.A., Landsbury, R.D. and MacDuffie, J.P. (eds) (1997), *After Lean Production. Evolving Employment Practices in the World Auto Industry*, Ithaca, NY: Cornell University Press.

Marshall, A. (1919), *Industry and Trade*, London.

McAfee, R.B., Bruce, R., Glasman, Myron and Honeycutt, Earl D. Jr. (2002), 'The effects of culture and human resource management policies on supply chain management strategy', *Journal of Business Logistics*, **23** (1), 1–18.

Morgan, K. (1997), 'The learning region: institutions, innovation and regional renewal', *Regional Studies*, **31**, 491–503.

Perry, M. (1999), 'Clusters last stand', *Planning, Practice and Research*, **14** (2), 149–52.

Piore, M. and Sabel, C.F. (1984), *The Second Industrial Divide: Possibilities for Prosperity*, New York: Basic Books.

Porter, M. (1998), 'Clusters and the new economics of competition', *Harvard Business Review*, **76** (6), 77–91.

Pulignano, V. (2002), 'Dynamic forms of control at work: a research note on integrated supply chains in the motor industry in southern Italy', *Work, Employment and Society*, **16** (1), 185–96.

Rainnie, A. (1989), *Industrial Relations in Small Firms*, London: Routledge.

Rainnie, A. (1991), 'Just in time, subcontracting and the small firm', *Work, Employment and Society*, **5** (3), 353–75.

Roberts, I., Sawbridge, D. and Bamber, G. (1992), 'Employee relations in smaller enterprises', in B. Towers (ed.), *Handbook of Industrial Relations Practice*, London: Kogan Page.

Saunders, M.J. (1995), 'Chains, Pipelines, Networks and Value Stream: The Role, Nature and Value of such Metaphors in Forming Perception of the Task of Purchasing and Supply Management', *First Worldwide Research Symposium on Purchasing and Supply Chain Management*, Temple, Arizona, pp. 476–85.

Scarbrough, H. (2000), 'The HR implication of supply relationships', *Human Resource Management Journal*, **10** (1), 5–17.

Storey, D.J. (1994), *Understanding the Small Business Sector*, London: Routledge.

Streeck, W. (1993), 'Industrial districts and local economic regeneration', *Industrial and Labor Relations Review*, July, 741–2.

Trigilia, C. (1992), 'Trabajo y politica en los distritos industriales de la tercera Italia', in F. Pyke, G. Becattini and W. Sengenberger (eds), *Los Distritos Industriales y las Pequeñas Empresas I: Distritos industriales y cooperación Inter.-empresarial en Italia*, Madrid: Ministerio de Trabajo y Seguridad Social.

Turnbull, P. et al. (1993). 'Winners and losers: the "tiering" of component suppliers in the UK automobile industry', *Journal of General Management*, **19** (1), 48–62.

Weimer, S. (1992), 'Republica federal de Alemania', in W. Segenberger, G.W. Loveman and M.J. Piore (eds), *Los Distritos Industriales y las Pequeñas Empresas II. El Resurgimiento de la Pequeña Empresa*, Madrid: Ministerio de Trabajo y Seguridad Social, pp. 131–80.

Whitford, J. (2001), 'The decline of a model? Challenge and response in the Italian industrial districts', *Economy and Society*, **30** (1), 38–65.

Wilkinson, A. (1999), 'Employment relations in SMEs', *Employee Relations*, **21** (3), 206–17.

Williamson, O.E. (1975), *Markets and Hierarchies: Analysis and Anti-trust Implications*, New York: Free Press.

Wray, D. (1996), 'Paternalism and its discontents: a case study', *Work, Employment and Society*, **10** (4), 701–15.

# 10. Cluster trajectories in developing countries: a stage and eclectic approach applied to survival clusters in Central America*

**Mario Davide Parrilli**

## 1. INTRODUCTION

The literature on clustering shows that this is an important means to promote the competitiveness of small and medium enterprises (SMEs) in global markets; see, for example, the discussion provided by Pitelis and Pseiridis in Chapter 2 of this volume. In the specific context of developing countries, if clustering is properly organised, it can also help to avoid the typical division of society that makes more difficult the way out of underdevelopment (Parrilli, 2004a). In this chapter the analysis focuses on survival clusters, a specific type of cluster that is quite common in developing countries. It identifies two main keys to interpret and promote competition in developing-country clusters.

Two hypotheses form the basis of the approach taken here. The first suggests that SME clusters pass through various stages in a trajectory of growth. Analyses on the history of industrial districts (IDs) in Italy open up the possibility that SME clusters in general tend to pass through stages in a process of social and economic upgrading (Parrilli, 2004b). This hypothesis introduces an opportunity for the development of many 'survival' (Altenburg and Meyer-Stamer, 1999) and 'satellite' (Knorringa, 2002; Guerrieri and Pietrobelli, 2004) clusters in developing countries, which can have the effect of dynamising policy support in those contexts. This approach represents a change with respect to existing literature, which tends to be more pessimistic about these kinds of clusters.

The second hypothesis refers to the different but complementary factors that contribute to the development of clusters. The chapter explores the key forces that are emphasised by the main theoretical and policy approaches to SME cluster development. However, the integration of these forces through

an 'eclectic' approach may help to explain why many clusters have not grown as desired, and assist in planning more effective support policies and actions. This second aspect also introduces a modification with respect to the main policy approaches to SME cluster development, which tend to be less comprehensive, but for this reason may also be less effective.

In the following section the theoretical framework is discussed. Thereafter, the empirical Section 3 investigates the impact of economic, social and policy factors on the growth process of developing-country clusters. The evidence is taken from two furniture clusters in Central America: Sarchí in Costa Rica, and Masaya in Nicaragua. A final section of conclusions is then presented.

# 2. THEORETICAL FRAMEWORK

## 2.1 Survival Clusters in Developing Countries

The academic literature on SME clusters essentially focuses on very successful clusters in both developed (Marshall, 1918; Brusco, 1982; Piore and Sabel, 1984; Best, 1990; Becattini, 2000) and developing countries (Schmitz, 1992; van Dijk et al., 1994; Nadvi and Schmitz, 1999; van Dijk and Sandee, 2002). More recently, new tendencies of development are being explored, such as the establishment of trans-local and trans-national networks of SMEs (Guerrieri and Pietrobelli, 2004; Rabellotti, 2001; Gilly and Torre, 1998; Storper, 1998; Bianchi, 1998), and urban trans-sectoral networks and clusters (Fujita et al., 2001; Krugman, 1998; Audretsch, 1998; Scott, 1998).

The major trend in research on clusters focuses on the new competitive and technological frontiers of the most advanced types of clusters; something that is reflected, for example, in the chapters by Henry and Pinch (Chapter 5) and Di Tommaso et al. (Chapter 13) in this volume. This research effort is motivated by the need to find a developmental answer to the situation of many national economies that are based upon traditionally strong local production systems (e.g. Italy, France, etc.), and which are struggling to maintain their share in the global market.

However, this focus leaves unanswered the problematic of other world regions and of kinds of clusters that do not work close to technology frontiers. In fact, the development role played by plenty of 'survival' clusters in developing countries is underscored from both a research and policy perspective. These clusters can be defined as local systems composed of many craft producers working independently from one another (i.e. no division and specialisation of labour) and elaborating individual products

of rather low quality (due to little use of machinery) for the low-income segment of local consumers. In general, these local firms do not grow, but tend to reproduce their own capital, giving to the owner's family merely the means to subsist (Altenburg and Meyer-Stamer, 1999). Such local systems are often neglected, in spite of their density and importance in the economic life of developing countries, and the large number of operations that many development agencies realise for SMEs in developing countries. That is why focusing on these cases seems to us worthwhile.

The chapter introduces its overall argument by widening the 1970s slogan on small enterprises, 'Small is beautiful' (Schumacher, 1972), to the core of this analysis, hypothesising that 'clustering is beautiful', of course under specific conditions. This approach underlines the good, although often small, steps that not-yet-competitive clusters also make with regard to local economic development. As a consequence, it justifies the setting up of a more complete and strong policy support in such cases.

A general perspective, however, would seem to contradict the reality, since SME clusters are not uniformly competitive: some are more competitive than others. Indeed, some theorists would argue that, among SME clusters, some have the capacity to grow while others do not. This view indicates that many clusters in developing countries are likely to be 'survival clusters', whose economic performance tends to stagnate (Altenburg and Meyer-Stamer, 1999; Knorringa, 2002; Amin, 1994).[1]

## 2.2 A Flexible Stage Approach

The general argument of this work is that all kinds of clusters, at different extents and speeds, can grow. This is what makes 'clustering beautiful'. This view is based upon a previous study indicating that even successful experiences, such as the Italian IDs, passed through a trajectory of growth that started from basic types of agglomerations (i.e. concentration of workshops), which very much resemble the category of 'survival clusters' in developing countries, and then upgraded into more developed ones, such as the present new competitive IDs (Parrilli, 2004b).

One of the objectives of the chapter is to establish a methodological approach which could have significant effects on policy making for clusters in developing countries. It is a stage approach that is based upon the transformation of Brusco's identification of four historic models that synthesised the debate on local production systems in Italy from the 1950s onwards (Brusco, 1990) into the effective sequence of stages IDs passed though in their trajectory of growth. The first of these models concerns the process of agglomeration of small workshops, specialised in traditional manufacturing activities, which started in the Third Italy a few years before

the Second World War (these are what most closely resemble 'survival clusters'). The second model relates to the 1950s and early 1960s, when a few large enterprises took the lead in local production systems, concentrating manufacturing activity, but also spurring the shift from craft to industrial production (i.e. scale economies for mass consumption).

The third model refers to the crisis of the Fordist system, which promoted an intense creation of dynamic SMEs capable of jointly producing and marketing their products abroad (Brusco calls it ID Mark I). This started at the end of the 1960s and went on until the end of the 1980s. A fourth model has been discussed in the last ten or fifteen years, referring to a global environment in which competition forces SMEs to shift up the technological frontier to avoid the 'low-road competition' of newcomers (Pyke and Sengenberger, 1990; Kaplinsky and Readman, 2001; Guerrieri and Pietrobelli, 2004). These are called ID Mark II (Brusco, 1990).

In my view, these four models represent the historic sequence of the stages of development of Italian IDs. This consideration leads to a hypothesis that 'survival clusters' in developing countries, which closely resemble the early agglomeration of craft enterprises of the first stage of ID development, have the same kind of opportunity to grow over time. Of course, this does not mean that those clusters are progressing in the best possible way, but that they represent a reality with an interesting potential.

The analysis of stages is a useful exercise, even in the context of developing countries, since it suggests that policy makers should avoid crossing too many stages at once during overly ambitious development efforts. This danger particularly occurs with those clusters that, for some researchers, do not show much potential for growth, such as the so-called 'survival clusters' (Altenburg and Meyer-Stamer; 1999; Knorringa, 2002).

Thinking in terms of development models (i.e. industrial districts) leads national and local governments, and parts of the private sector, to expect too much in the short term (Humphrey, 1995; Pietrobelli and Rabellotti, 2004). When positive outcomes do not arrive promptly, people tend to overreact. For instance, local craft producers start feeling inadequate to replicate the ID model and refuse to participate in governmental support programmes, making these programmes less effective.

Through the identification of the sequence of development of Italian IDs, this chapter proposes the most feasible short-term development steps for less dynamic clusters in developing countries, as well as the policy framework that can produce effective results in such a timeframe. This does not imply that every SME cluster must pass through all the above-mentioned stages of growth. It only reaffirms that the development of clusters is a stage process, whose steps and trajectory need to be analysed in detail to plan adequate steps ahead through appropriate development policies.

## 2.3 The Eclectic Approach

The first 'stages' hypothesis can be complemented with a parallel hypothesis, which refers to the factors that promote the growth of clusters. This second hypothesis indicates that growth (and its speed) depends on several factors, which are economic, political and social in essence, and can be related to the major streams of literature on SME cluster development in developing countries.

A first relevant stream of literature on clustering shows the importance of 'collective efficiency' for the success of many clusters. In these cases, joint actions and external economies are widely recognised factors that allow the local system to respond flexibly to market demand and to grow (Schmitz, 1992; Van Dijk et al., 1994; Nadvi and Schmitz, 1999; van Dijk and Sandee, 2002; Pietrobelli and Rabellotti, 2004).[2]

A second approach emphasises the social factors that support the development process. In particular, these social features include local social cohesion, which is visible in the tendency to maintain trustful and cooperative relations that ease transactions among local agents and reduce costs (Becattini, 1990; Trigilia, 1991; Lorenz, 1992; Dei Ottati, 1994; Platteau, 1994).[3]

This social approach to SME cluster development should also involve another element, to complement the first and shape a systemic approach to social development in SME clusters: the push to self-realisation. In the context of SME clusters this is represented by the tendency towards intense local entrepreneurship, spin-offs of new firms and innovation (Brusco, 1982; Bagnasco, 1988; Becattini, 2000; Bellandi, 2001). These differ from other contexts, where self-realisation is sought through careers in large corporations and public institutions.

The key point of this systemic attempt is that the two aforementioned elements are not to be seen in isolation from one another, but as interdependent factors that jointly produce a 'positive-sum game' for the local system as a whole. In fact, social cohesion alone can generate a socially comfortable but economically static society, while self-realisation alone can create a dualistic society, in which a smaller part can join the international market and the technology frontier, while a larger part remains linked to very traditional production and markets generating poor performances (Bianchi and Parrilli, 2002; Parrilli, 2004b).

A third group of scholars highlight the proactive policy and institutions that contribute to the success of SME clusters. The case of Italian IDs illustrates the several laws, incentives and institutions that have allowed the producers to achieve higher competitive standards over time (Capecchi,

1990; Arrighetti and Serravalli, 1997; Bianchi, 1998; Bertini, 1998; Cowling and Sugden, 1999).[4]

Alongside this, a further stream of literature focuses on the policy inducement of the development process but with a different emphasis, stressing the role of the governance system in which SME clusters are involved as a key influence of their growth opportunities. This aspect is based on the power relations in which they are involved, these being either hierarchical, network-based or market-based (Humphrey and Schmitz, 2000; Pietrobelli and Rabellotti, 2004). The governance-based methodology for analysing clusters proposed in Chapter 3 by Sugden et al. reflects such concerns, and the relationship between local and global governance is also discussed in detail by Gilly and Perrat in Chapter 7.

In our hypothesis, these three types of factors (collective efficiency, social embeddedness and policy inducement) spur development in a cumulative way. The history of successful SME clusters, particularly the Italian IDs, shows that such outstanding development has been promoted by many factors at work simultaneously (Parrilli, 2004b; Becattini, 2000; Brusco, 1982). In this sense, when these factors work together, the development process is likely to speed up. When they do not, growth is likely to slow down. This would also help to explain why some clusters are more developed than others (e.g. Italian IDs versus 'survival' clusters).[5] That is why, on the whole, an 'eclectic approach' to SME cluster development is likely to be very useful for setting up appropriate policies for the promotion of this important actor in developing countries.

## 3. EMPIRICAL EVIDENCE FROM TWO CLUSTERS IN COSTA RICA AND NICARAGUA

### 3.1 The Context

This section analyses data from two furniture clusters, located in two Central American countries: the clusters of Masaya in Nicaragua, and Sarchí in Costa Rica.

Considering standard indicators of performance (e.g. sales, income, export and fixed assets), it is evident that these clusters are not competitive within the global market. They represent different situations and development prospects.[6] However, following our theoretical framework, here we are not interested in analysing standard indicators of performance, but rather in understanding what development process these clusters have gone through, whether they can grow further, and what future steps/stages they can effectively target.

A simplified observation indicates that these Central American clusters represent something close to the craft mode of production, with attempts to upgrade to industrial production. In this sense, they represent examples of the aforementioned 'survival clusters'.

This preliminary consideration does not prove that all SME clusters will upgrade from lower to higher competitive stages. However, discussing this hypothesis is the first objective of this chapter, which should help to present the actual dynamism of each type of cluster, against the widespread idea that 'survival clusters' in developing countries do not grow (Altenburg and Meyer-Stamer, 1999; Knorringa, 2002).

The second objective refers to analysing the development of each of the clusters by adopting an eclectic approach that integrates three types of factors of development, which represent the main approaches to SME cluster development briefly summarised above (i.e. collective efficiency, policy inducement and social embeddedness). These aspects should help explain the different competitiveness of these clusters.

The analysis is based upon 63 case studies of micro, small and medium enterprises: 30 in Masaya and 33 in Sarchí. In both clusters only firms with less than 30 workers operate. These firms have been identified through a random selection based upon the universe of local enterprises (BCN, 1996; Murillo, 2002). The information that is presented does not focus specifically on performance indicators, but rather on those factors that the main approaches to SME cluster development identify (i.e. external economies and joint actions, social cohesion and self-realisation, national and local policies).

## 3.2 The 'Survival Clusters' of Sarchí, Costa Rica, and Masaya, Nicaragua

Both clusters are quite new, since furniture production was only undertaken on a significant scale in the 1980s. In this sense, a first similarity can be seen between these two clusters and Italian industrial districts in their first stage of craft agglomeration.

Sarchí is a small town (25 000 inhabitants) on the central mountains of Costa Rica, 50 km from the capital San José, and 30 km from the other main towns of the country, Alajuela and Heredia. It is an old cluster with traditions in oxcart production. It was only in the 1980s that some artisans started focusing on furniture, due to the fall in demand for oxcarts, which became more of a decorative art, and the growing demand for furniture expressed by national consumers (Perez-Sáinz, 1994). Little by little, the number of micro and small enterprises reached 120, producing various kinds of furniture, mainly for the national market, with limited projections into export markets (Murillo, 2002).

Masaya is a town of about 100 000 people. Typically, the people work in craft activities linked to production of shoes, clothes, hammocks and furniture. This town is situated 30 km from the capital, Managua. Like Sarchí, this is also a new cluster, since before the 1980s few workshops were producing furniture for local consumers. Through the 1980s many more workshops started operating and benefiting from the governmental institution delegated to the purchase of inputs and sale of products: the Chamber of the National Industry (CONAPI). With the election of liberal governments in the 1990s, CONAPI was substituted by a new governmental institution, INPYME (National Institute for supporting SMEs), which offered a more market-friendly support to SMEs. The number of SMEs increased to the present 120 micro and small enterprises (BCN, 1996). Nowadays, this cluster produces mainly for the local market, although production for national and international markets has been starting in recent years (e.g. Costa Rica, the USA).

Under the 'collective efficiency approach', a few remarks can be made about these two clusters. In Sarchí, two 'joint actions' are being implemented, one of which refers to a long-standing sales cooperative, which is having growing success. The other refers to a new municipal production committee, that in cooperation with the local department of the Health Ministry, studies new ways to promote local production (e.g. through attracting tourists to the local rainforest reserve), as well as the relocation of enterprises in industrial areas to prevent pollution problems to the population (i.e. dust and noise).

Informal exchanges are also very common among producers: 70 per cent of them are used to lending each other machinery, inputs and workers, in an atmosphere of mutual support. These relations ease daily operations and help to reduce overall transaction costs.

In Masaya the situation is more difficult with respect to cooperation. Only 30 per cent of the entrepreneurs experience an informal type of cooperation and no business association exists. These negative data can be explained by the recent history of Nicaragua. The military conflicts from the 1970s up to the early 1990s led to distrust among people. Moreover, the cooperative system that was developed by the socialist government in the 1980s fell into crisis with market liberalisation in the early 1990s. The associated producers started a struggle to capture some assets; some gained their share, but others did not. This whole story left bad feeling among many producers in the country and make it harder to develop joint actions now (Parrilli, 1999).

None the less, something seems to be changing. Growing efforts to organise public meetings among economic, social and political agents can be noticed within the municipality. These efforts have been leading to the creation of a municipal production committee, which involves representatives of the

SMEs as well as local NGOs, international agencies (i.e. UNIDO), and the local authority (i.e. the mayor). This committee is supposed to support the requests of the producers for more adequate services to local production (e.g. market promotion).

Considering external economies, Sarchí seems to be benefiting from a variety of spillovers, in terms of clients flowing into the locality (which has led the producers to start a recent wave of investments in retail shops), abundance of labour, and flows of innovations and information (e.g. visible in the progressively more extended use of newer materials). In general, withdrawing from standard analyses of performance (sales, exports, income, investments, etc.), Sarchí looks like a dynamic cluster in which local producers try to capture all the possible spillovers from each other's activities.

In Masaya, labour is abundant. This is due to the national recognition of this locality as a cluster for furniture production, a manufacturing activity that has the capacity to create growing employment conditions. The flow of clients has also been increasing in the past five to seven years, according to the growing stability of the country. This has created better commercial opportunities for producers.

In contrast, the entrepreneurs consider the flow of innovations and information quite poor. They often complain about the local tendency to imitation, which pushes them to be more secretive. Our interpretation suggests that innovations in these clusters are not qualitatively outstanding. All furniture makers manage similar technology, materials, components and often clients. This situation seems to explain why it becomes less relevant to capture these (incremental) innovations in the locality. In contrast, the recent birth of this cluster explains the attention that is paid to labour and clients/traders.

In social terms, the spirit of 'self-realisation' is expressed by the tendency to form new enterprises. In a significant measure, present SMEs in both Sarchí and Masaya have spun off a large number of micro and small firms over the past few years (respectively 75 per cent in Sarchí and 53 per cent in Masaya). These aspects are consistent with a strong local socio-economic dynamism, for two main reasons: on the one hand, the need to create new income opportunities in rather poor countries (it would be more the case of Masaya than Sarchí) (Tokman, 1992); on the other, the desire workers manifest to set up their own business, manage independently their own daily activity, and succeed as entrepreneurs (Hyalager, 1993).

The recent birth of these clusters promotes firm creation and spin-off, because know-how is accumulating and a large number of people (e.g. workers, young people) want to experiment with their abilities to succeed in the main local specialisation. They feel that there is a large market to

join and that clients constantly visit the locality. Thus they worry less about the costs of setting up an enterprise, since they will do it at the lowest cost by buying some basic machinery and/or contracting out the stages of production that are costly to make in house.

In the case of Sarchí, this strong tendency to firm creation is also rooted in the more stable political and economic environment of the country, which reduces risks and eases the calculation of returns to investments. In both Sarchí and Masaya, this tendency is also linked to the recognised leadership they have been acquiring in their own countries as the leading furniture clusters.

Innovation is another important indicator of the push to 'self-realisation' in clusters. Of course, this type of innovation does not refer to original inventions, but rather to the adoption and/or imitation of international benchmarking practices related to this specific sector (Romjin, 2002; Parrilli, 2002). The innovation efforts realised by the producers are relevant. On average, 50 per cent of the producers in these localities are making investments in product, process and market innovations, although often the amount is small, due to the poor availability of capital and the high cost of financial resources in the local market.

In Sarchí there are signs of firms undertaking innovation in terms of industrial specialisation (e.g. specific products), technology investments (e.g. new techniques and materials) and market orientation (e.g. 'green' certificates for inputs of production).

In Masaya, 49 per cent of the producers innovate. This means that they adopt better production and market practices. It is very common for producers to imitate newer products observed in the market, by adding some personal aspects that introduce some kind of product differentiation (Romjin, 2002). Of course, this differentiation is not very evident to ordinary consumers; nor does it permit the producer to avoid price competition. In marketing, innovation refers mainly to the search for new clients, possibly foreign traders, for which producers increasingly participate in international fairs. A higher international interest for local production is evident, as the growing number of exporting producers in the past five–six years shows.[7]

The simplicity of the innovative effort in Masaya and in Sarchí depends mostly on the severely restrained access to credit for investments. Annual interest rates in Central America are still higher than 20 per cent, and high guarantees are also required, which reduce sharply the possibility to apply for investment credit (BCN, 2002; BCCR, 2002).

In terms of social cohesion, there are extra-economic activities (e.g. sport, religious groups, ecology, schools). A significant 55 per cent of producers in Sarchí participate in these activities, which spur local social cohesion (about 25 per cent in Masaya). This indication supports the hypothesis that

these clusters are well endowed with elements that can spur joint actions and collective planning for development.

The length of work relationships within these clusters is relevant too. Sarchí and Masaya reach respectively 4 years and 3–3.5 years on average. This low result reflects the short life of these clusters and of most enterprises (13 years in Masaya and 16 in Sarchí). In the case of Masaya it also reflects the civil conflicts of the 1970s and 1980s, and the tensions following liberalisation in the 1990s.

In terms of policy inducement, public policy has not been supportive until now. In the case of Costa Rica, the first national policy for SME promotion was only approved in 2002. The related law is now going through a process of institutionalisation and implementation, with the creation of appropriate guarantee funds and technological funds, among other instruments.[8] Up to now, all industrial and development policies have been directed to sector development (e.g. high-tech sectors) and export, independently of the existence of clusters and SMEs (Aguilar et al., 1998).

At the local level, the most significant public policy impact in Sarchí is in terms of new costs. In fact, the local office of the Health Ministry requires an improvement of the working conditions to control emissions from workshops, while the municipal authority worries about the payment of production licences (Murillo, 2002). These pressures push the producers to relocate in appropriate industrial areas outside the town. Individual investments are taking place, while municipal and state support have not yet materialised. The talks about this held within the production committee represent a step towards the institutional consolidation of furniture production in Sarchí.

In Nicaragua, a law for SMEs has been discussed from the mid-1990s, but the coalition of forces (i.e. four associations of SMEs, and international agencies such as UNIDO and the German GTZ) has not been able to persuade Congress to approve the law (Parrilli, 2003; INCAE, 1997). In recent years, a growing number of international agencies and local NGOs have started to support SME and cluster development. However, they do not share a uniform approach and a common development plan, which is why they do not produce strong results (see Parrilli, 2003).

At the local level, many NGOs and governmental organisations are working with groups of firms in Masaya. These institutions tend to work in a fragmented way, each one supporting a group of producers through the delivery of business development services (e.g. training, technical assistance, credit). But they do not seem to worry about pulling together local entrepreneurs in sector and local collective initiatives (Barahona et al., 1998).

However, there are signs of a growing consciousness of this need. In fact, a few years ago the local authority promoted the restructuring of an old castle to make it a market for all types of craftworks, and it has become a point of reference for tourists. More recently, the mayor and UNIDO have been promoting the creation of a local production committee composed of representatives of producers, international agencies (i.e. UNIDO), governmental institutions (e.g. INPYME, PROSEDE – Program for Developing Services) and local NGOs. It is still early to assess the results of this initiative.

In synthesis, this analysis leaves aside standard indicators of performance (see note 6), which would make of Sarchí and Masaya two simple 'survival clusters', with little or no capacity to grow. In contrast, it shows elements of interesting dynamism in these localities. Sarchí cannot be compared to competitive clusters in industrialised and industrialising countries, since its enterprises are all micro and small enterprises producing mainly for the small national market, but it may be compared to those clusters (e.g. Italian IDs) in their first stage of development (Parrilli, 2004b). It may seem even more dynamic than that kind of cluster. In fact, Sarchí shows several interesting aspects, such as the new wave of investment in retail shops (which occurred in Italian IDs in the 1980s, when the cluster had already opened the export market), and the various attempts at innovation in the use of materials and techniques more in line with international standards (e.g. green certificates, use of plantations). The policy support also shows significant changes towards a more supportive approach (e.g. the new law for SMEs) at the national level as well as at the local level, for example the recent local production committee set up to solve critical issues for local production.

Masaya shows as yet an ambivalent condition. Some joint actions are taking place, through the support of international agencies and local NGOs; labour abundance and client inflow constitute significant external economies; the spirit of entrepreneurship has been growing, while social cohesion still suffers from the long civil conflict of the 1970s and 1980s. Governmental policy is more significant at the local level, but it is rather poor at the national level. On the whole, Masaya shows new interesting elements of dynamism, which confirm the hypothesis that this supposed 'survival cluster' is developing and that 'clustering is beautiful' even for these less competitive clusters. Simultaneously, Masaya manifests weaknesses that need to be addressed to create a purposeful environment to push this cluster to higher development levels. This can be done through an eclectic policy approach that pulls together different types of complementary public support actions.

# 4. CONCLUDING REMARKS FOR POLICY MAKING

This study does not underestimate the substantial competitive differences that appear among SME clusters. Sarchí and Masaya do not achieve comparable competitiveness (e.g. production, exports, etc.) with respect to worldwide successful industrial districts and clusters. However, this aspect is not the objective of this work, which rather emphasises the dynamic aspects of growth in these different contexts. Two main conclusions can be extracted from this analysis. The first is that the selected 'survival clusters' show several elements of dynamism and development. Competitive differences do not represent definitive gaps; they rather represent different stages of development which the clusters are passing through in their trajectory of growth.

The study of these two clusters clarifies that development is a complex process that implies upgrading through stages. Each of these clusters is passing through a specific stage. Sarchí and Masaya represent craft-type agglomerations attempting to shift to industrial production, while successful clusters are now passing through more advanced stages of growth (e.g. from traditional IDs to new competitive IDs). Other transitions are due, which need to be identified in each specific case in order to better plan the policy support and the feasible steps that can be expected from producers and the whole cluster in the short term.[9]

The common negative perception of the so-called 'survival clusters' can be readdressed to allow developing countries to reap more benefits from the presence of this kind of not-yet-competitive SME agglomeration. From an industrial policy perspective, this position stresses that more efforts can be made to identify feasible development steps for these kinds of clusters. This is more likely to motivate all local forces to join together (e.g. entrepreneurs, private and public agencies) and create higher economies of agglomeration, which will help them enter competitively in global markets.

The second conclusion addresses the determinants of growth at the cluster level. The evidence seems to confirm the hypothesis that a thorough approach to development includes types of factors extracted from the main bodies of literature on clustering: collective efficiency, social embeddedness and policy inducement. This approach can explain the diversified historical development of SME clusters and their present competitiveness, and do justice to the complexity of the development process, which takes place on the basis of the dynamic and reciprocal interrelations among these types of factors and their cumulative effect on local production systems.

When only a few of these factors work simultaneously, the outcome is likely to be less than optimal, which is what can be seen in 'survival clusters'.

Vice versa, when all these determinants work simultaneously, the outcome is more likely to be at a high level, which is what happened with the successful experience of Italian IDs (Parrilli, 2004b).

# NOTES

* I would like to thank Roger Sugden at the University of Birmingham, Peter Knorringa at the Institute of Social Studies in The Hague, Carlo Pietrobelli at the University of Rome 3 and Sandrine Labory at the University of Ferrara for the useful comments they gave me on previous versions of this chapter. I would also like to thank Patrizio Bianchi at the University of Ferrara and Marco Bellandi at the University of Florence for their important suggestions on this subject during informal meetings and discussions. Finally, I would like to thank the colleagues who participated in the workshops in Toulouse, March 2004, and Reus, March 2003, where earlier elaborations of this work were presented and discussed, and the colleagues and students who participated in the 5th Central American School in Industrial and SME Development Policy, held in San José de Costa Rica, in July 2004.

1. This overall argument could be used, to some extent, for another type of less competitive cluster: the satellite cluster described by Markusen (1996) in her study of the US economy, but that also exists in developing countries (Knorringa, 2002; Guerrieri and Pietrobelli, 2004).
2. See also the chapter by Bellandi in this volume (Chapter 4) specifically on the provision of public goods, and those by Henry and Pinch (Chapter 5) and Di Tommaso et al. (Chapter 13) on knowledge and technology dynamics.
3. This approach partially overlaps the first in the emphasis it puts on trustful local relations as a basis to lower transaction costs and increase efficiency (Humphrey and Schmitz, 1998; Nadvi, 1999). See also Pitelis and Pseiridis's framework for analysing productivity effects, and Dupuy and Torre's detailed analysis of trust relationships, both in this volume (Chapters 2 and 8 respectively).
4. In this volume, the chapters by Aranguren et al., Di Tommaso et al., and Sacchetti and Tomlinson are particularly relevent regarding discussion of policy-related factors (Chapters 12, 13 and 11 respectively).
5. Consistent with the objective of this chapter, this consideration does not reflect the meaningful effects that the macroeconomic structure and stability of the country certainly has on SME cluster development (Peres and Stumpo, 2000).
6. The mode for sales ranges from $3000 to $6000 in Sarchí (with higher peaks) to $2000 to $3500 in Masaya (with higher peaks). Fixed assets range very differently, from about $30 000 in Sarchí to about $10 000 in Masaya (author's survey).
7. Information comes from interviews with entrepreneurs and officers participating in the project PROFOR (Forestry Project) of the World Bank, in cooperation with the Ministry of Agriculture and Forestry of Nicaragua, which helped furniture producers to participate in international trade fairs in Köln in 1998 and Valencia in 1999.
8. Information obtained from a presentation of the Minister of Economy, Vilma Villalobos, during the Central American School in Industrial Development and SME Policy, held in San José, 4 August 2003.
9. Interestingly, the contribution by Sacchetti and Tomlinson to this volume (Chapter 11) implies the possibility that there is a 'stage too far' with regard to cluster development, something that might provide a warning for such survival clusters.

# REFERENCES

Aguilar, J., Cordero, J. and Trejos, S. (1998), *Estrategia tecnologica y desempeño exportador de la pequeña y mediana empresa: el caso de Costa Rica*, Serie

Divulgacion Economica no. 31, Instituto de Investigaciones en Ciencias Economicas, Universidad de Costa Rica, San José.

Altenburg, T. and Meyer-Stamer, J. (1999), 'How to promote clusters: policy experiencies from Latin America', *World Development*, **27** (9), September, 1693–714.

Amin, A. (1994), 'The difficult transition from informal economy to Marshallian industrial district', in UNCTAD, *Technological Dynamism in Industrial Districts*, Geneva, pp. 51–72.

Arrighetti, A. and Seravalli, G. (1997), 'Istituzioni e dualismo dimensionale dell'industria italiana', in F. Barca (ed.), *Storia del capitalismo italiano dal dopoguerra ad oggi*, Rome: Donzelli Editore, pp. 335–88.

Audretsch, D.B. (1998), 'Agglomeration and the location of innovative activity', *Oxford Review of Economic Policy*, **14** (2), 18–29.

Bagnasco, A. (1988), *Il mercato come costruzione sociale*, Bologna: Il Mulino.

Banco Central de Costa Rica (2002), *Indicadores económicos*, San José de Costa Rica, websiec.bccr.fi.cr/.

Banco Central de Nicaragua – Instituto Nacional de Estadística – Ministerio de Economía (1996), *Directorio nacional de las industrias manufactureras*, Managua.

Banco Central de Nicaragua (2002), *Informe Anual*, Managua.

Barahona, T., Parrilli, M.D. and Narvaez, E. (1998), *La cadena maderera: en busca de los eslabones perdidos*, Cuaderno de Investigación no. 6, Nitlapán, Universidad Centroamericana, Managua.

Becattini, G. (1990), 'The industrial district as a socioeconomic notion', in F. Pyke, G. Becattini and W. Sengenberger (eds), *Industrial Districts and Interfirm Cooperation*, Geneva: International Institute for Labour Studies.

Becattini, G. (2000), *Il distretto industriale*, Turin: Rosemberg & Sellier.

Bellandi, M. (2001), 'Local development and embedded large firms', *Entrepreneurship and Regional Development*, **13** (1), 189–210.

Bertini, S. (1998), 'SMEs, industrial development and competitiveness in Italy', in AESMEC Conference, Naples.

Best, M. (1990), *The New Competition*, London: Pinter.

Bianchi, P. (1998), *Industrial Policy and Economic Integration*, London: Routledge.

Bianchi, P. and Parrilli, M.D. (2002), *Obstaculos y oportunidades de inversion publica para el desarrollo de las pequeñas y medianas empresas en Chile*, Inter-American Development Bank, Santiago.

Brusco, S. (1982), 'The Emilian model: productive decentralistion and social integration', *Cambridge Journal of Economics*, **6**, 167–84.

Brusco, S. (1990), 'The idea of industrial districts', in F. Pyke, G. Becattini and W. Sengenberger (eds), *Industrial Districts and Interfirm Cooperation*, Geneva: International Institute for Labour Studies.

Capecchi, V. (1990), 'A history of flexible specialisation and industrial districts in Emilia-Romagna', in F. Pyke, G. Becattini and W. Sengenberger (eds), *Industrial Districts and Interfirm Cooperation in Italy*, Geneva: International Institute for Labour Studies, pp. 20–35.

Cowling, K. and Sugden, R. (1999), 'The wealth of the localities, regions and nations: developing multinational economies', *New Political Economy*, 4 (3), 361–78.

Dei Ottati, G. (1994), 'Trust and the interlinking of credit', *Cambridge Journal of Economics*, **18** (6), 529–46.

Fujita, M., Krugman, P. and Venables, A. (2001), *The Spatial Economy*, Cambridge, MA: MIT Press.

Gilly, J.-P. and Torre, A. (1998), 'Dinamiche di prossimità e reti: introduzione', *L'Industria*, **XIX** (3), 433–62.

Guerrieri, P. and Pietrobelli, C. (2004), 'Industrial districts' evolution and technological regimes: Italy and Taiwan', *Technovation*, 899–914.

Humphrey, J. (1995), 'Industrial reorganization in developing countries: from models to trajectories', *World Development*, **23** (1), 149–62.

Humphrey, J. and Schmitz, H. (1998), 'Trust and interfirm relations in developing and transition economies', *Journal of Development Studies*, April, 32–61.

Humphrey, J. and Schmitz, H. (2000), 'Governance and upgrading: linking industrial cluster and global value chains research', IDS Working Paper no. 120, Brighton, Institute of Development Studies.

Hyalager, A. (1993), 'Why not entrepreneurs', *Entrepreneurship and Regional Development*, **5** (1).

INCAE (1997), *Agenda de competitividad para Centroamerica*, Managua.

Kaplinsky, R. and Readman, J. (2001), *Integrating SMEs in Global Value Chains: Towards Partnership for Development*, Vienna: UNIDO Private Sector Development Branch.

Knorringa, P. (2002), 'Cluster trajectories and the likelihood of endogenous upgrading', in M.P. van Dijk and H. Sandee (eds), *Innovation and small enterprises in the Third World*, Cheltenham: Edward Elgar, pp. 48–65.

Krugman, P. (1998), 'What's new about the new economic geography?', *Oxford Review of Economic Policy*, **14** (2), 7–17.

Lorenz, K. (1992), 'Trust, community and cooperation', in M. Storper and A.J. Scott, *Pathways to Industrialisation and Regional Development*, London: Routledge.

Markusen, A. (1996), 'Sticky places in slippery space: a typology of industrial districts', *Economic Geography*, **72**, 293–313.

Marshall, A. (1918), *Industry and Trade*, London: Macmillan.

Murillo, I. (2002), *Diagnóstico de las empresas del sector muebles en Sarchí*, Ministerio de Salud (MINSA) de Costa Rica, Sarchí.

Nadvi, K. (1999), 'Shifting ties: social networks in the surgical instrument cluster of Sialkot, Pakistan', *Development and Change*, **30** (1), 143–77.

Parrilli, M.D. (1999), 'Apostando para un Nuevo actor del desarrollo en Nicaragua: las PYMEs industriales', *Revista Encuentro*, **XXX** (50), 5–16.

Parrilli, M.D. (2002), 'Innovation and competitiveness within the small furniture industry in Nicaragua', in M.P. van Dijk and H. Sandee (eds), *Innovation and Small Enterprises in the Third World*, Cheltenham: Edward Elgar, pp. 143–65.

Parrilli, M.D. (2003), 'Nicaragua: competitivdad de las MIPYME', in R. Hernández *Competitividad de las MIPYMEs en Centroamérica*, Mexico: CEPAL and GTZ, pp. 203–40.

Parrilli, M.D. (2004a), 'Integrating the national industrial system: the new challenge for Chile', *Review of International Political Economy*, **11** (5), 905–25.

Parrilli, M.D. (2004b), 'A stage and eclectic approach to industrial districts development: two policy keys for survival clusters in developing countries', *European Planning Studies*, **12** (8), 1115–131.

Peres, W. and Stumpo, G. (2000), 'Small and medium sized manufacturing enterprises in Latin America', *World Development*, **28** (9), 1643–55.

Perez-Sáinz, J.P. (1994), *Sarchí y el Capital Social*, San José, Costa Rica: FLACSO.

Pietrobelli, C. and Rabellotti, R. (eds) (2004), *Upgrading in Clusters and Global Value Chains*, Boston, MA: Inter-American Development Bank/MIT Press.

Piore, M. and Sabel, C. (1984), *The Second Industrial Divide*, New York: Basic Books.

Platteau, J.P. (1994), 'Behind the market, where real societies exist', *Journal of Development Studies*, **30** (3), 533–77.

Pyke, F. and Sengenberger, N. (1990), 'Introduction', in F. Pyke, G. Becattini and W. Sengenberger (eds), *Industrial Districts and Inter-firm Cooperation in Italy*, Geneva: International Institute for Labour Studies, pp. 1–9.

Rabellotti, R. (2001), 'The effects of globalisation on industrial districts in Italy: the case of Brenta', IDS Working Paper no. 144, Sussex University, forthcoming in H. Schmitz (ed.), *Local Enterprises in the Global Economy: Issues of Governance and Upgrading*, Cheltenham: Edward Elgar.

Romjin, H. (2002), 'Acquisition of technological capability in small firms in developing countries', in M.P. Van Dijk and H. Sandee, *Innovation and Small Firms in the Third World*, Cheltenham: Edward Elgar.

Schmitz, H. (1992), 'On the clustering of small firms', *IDS Bulletin*, **23**, 64–9.

Schumacher, E. (1972), *Small is Beautiful*, London: ITP Publications.

Scott, A.J. (1998), *Regions and the World Economy*, Oxford: Oxford University Press.

Storper, M. (1998), 'Innovazione come azione collettiva', *L'Industria*, **XIX** (3), 545–70.

Tokman, V. (1992), *Beyond regulation*, Geneva: ILO.

Trigilia, C. (1991), 'Italian industrial districts: neither myth nor interlude', in F. Pyke and W. Sengenberger, *Industrial Districts and Local Economic Regeneration*, Geneva: International Institute for Labour Studies.

Van Dijk, M.P., Pedersen, P.O. and Sverrisson, A. (eds) (1994), *Flexible Specialization in the Third World*, London: ITP Publications.

Van Dijk, M.P. and Sandee, H. (eds) (2002), *Innovation and Small Enterprises in the Third World*, Cheltenham: Edward Elgar.

# 11. Globalisation, governance and clusters: North Staffordshire ceramic and Prato textile industries*

**Silvia Sacchetti and Philip R. Tomlinson**

## 1. INTRODUCTION

In this chapter, we consider the experiences and challenges facing two European industrial clusters in the context of globalisation and increasing international competition. The cases chosen are both traditional, mature industries: the UK ceramics industry, which is concentrated in Stoke-on-Trent, North Staffordshire, and the Prato textile industry, based in Tuscany. Both regions have a long historical association with their respective industries and have been the focus of previous case studies, particularly in the literature on 'industrial districts'. While we recognise the usefulness of these previous studies, the scope of this chapter is not specifically to review this literature or to add more insights into the characteristics that define a typical 'industrial district'. Neither do we aim at assessing whether 'district experiences' may be transferred between different socio-economic environments.[1] Rather, given the mounting preoccupations of Western countries concerning the future of traditional industrial sectors in the global economy, we aim at assessing a possible future policy scenario for the North Staffordshire ceramics and Prato textile industries.

In each case, we specifically consider how each cluster is dealing with the challenges posed by globalisation and the effects that international competition is having upon each industry and the locality. A key theme in our analysis will be the question of governance within each cluster. This is an important issue since, as we shall argue, the nature of governance in a locality matters: it is interconnected with all of the challenges and issues that clusters and localities face in the global economy; see also the chapters by Sugden et al. (Chapter 3), De Propris and Driffield (Chapter 6), and Gilly and Perrat (Chapter 7). Moreover, governance issues are increasingly becoming the focus of public policy, particularly in Europe.[2]

In this respect, it seems relevant to adopt the strategic decision-making approach to industrial organisation (Zeitlin, 1974). Strategic decisions are those that govern the direction of firms, industries and essentially the long-term development of localities. If strategic decision making is more diffuse at the local and regional level, there is a greater likelihood that a locality may be able to achieve its collective interests.[3] However, if strategic decisions become concentrated among an elite subset of an industry's stakeholders, then there is a danger of a 'strategic failure' occurring: when strategic decisions taken by a corporate elite conflict with the wider public interest (see Cowling and Sugden, 1994, 1998). An understanding of governance structures and the nature of relationships between actors within an industry (and a locality) is therefore crucial in considering policy formulation to reduce the risks of 'strategic failure'.

In conducting our analysis, we follow the methodological framework for considering case studies set out in Branston et al. (2003) in the appendix to Chapter 3 of this volume, and as developed specifically for clusters by Sugden et al. in the main body of the chapter. We begin by briefly considering each cluster's social and economic background: specifically, its historical development, the composition of firms in the industry, the level and nature of employment, and the role of institutions and public agencies, before considering the questions of networking and governance. An analysis of the challenges posed by globalisation follows, leading to some discussion on possible future policy directions for each cluster. For clarity and consistency, each case is considered separately, although the reader will be able to draw similarities and comparisons throughout the discussion. Finally, Section 4 concludes.

## 2. CASE STUDY 1: THE NORTH STAFFORDSHIRE CERAMIC INDUSTRY

### 2.1 History, Institutions and Industrial Structure

Located between the Midlands and the North-West of England, the city of Stoke-on-Trent, in North Staffordshire, has a long tradition in the manufacture of ceramic products dating back to at least the late seventeenth century, the region's abundance of natural resources of clay, coal and river (and later canal) transport being favourable for the production of pottery.[4] Since then, it is estimated that over 1500 different pottery firms have operated in Stoke-on-Trent, with some firms (and famous brands) having a long history and association with the city, such as Aynsley (established 1775), Minton (1793), Wedgwood (1759) and Spode (1780) (see Keynote, 2003).

Indeed, the evolution of the UK pottery industry and its concentration in the city of Stoke-on-Trent helped to shape the industrial heritage and landscape and the social fabric of the region, with the industry providing long-standing employment for generations of the local population (Whipp, 1990). The historical developments of both the city and the ceramic industry are intrinsically linked, with the latter providing Stoke-on-Trent with its own unique regional identity – the city often being referred to as 'The Potteries'.[5]

Although both the industry and cluster may be considered as being 'mature', ceramics remains an important part of the North Staffordshire economy, with the fortunes of the sector continuing to have a significant impact upon the economic prosperity of Stoke-on-Trent and the surrounding area. This is reflected in the fact that the industry is the region's largest industrial employer, directly accounting for 15 per cent of total employment and approximately half of all manufacturing jobs in the city.[6] In addition, ceramics has become a 'heritage' industry, which has provided Stoke-on-Trent with the opportunity to develop a growing tourist sector: the industry's 'famous brands' attract visitors from all over the world.[7] The cluster also remains the nucleus of the UK ceramics industry, with the headquarters of the main industry bodies – the British Ceramic Confederation (BCC) and the Ceramic and Allied Trade Union (CATU) – and various ceramic research centres being based in the city.[8] The region accounts for over 73 per cent of all UK ceramics employment and retains 'a diversity of [ceramic] company types, sizes and wealth of occupations which have given the industry its character and nature' (Ceramic Innovations, 2003, p. 3). This industrial agglomeration of ceramics in North Staffordshire extends across all of the industry's subsectors – table and giftware, tiles and flag manufacture, sanitary ware, industrial ceramics and refractory products.[9] The most important of these subsectors is table and giftware, which accounts for 35 per cent of total industry output and 62 per cent of all industry employment (Keynote, 2003), and 84 per cent of all pottery workers in the area travel to Stoke to work (ECOTEC, 1999).

According to Keynote (2003), there are approximately 800 ceramic firms in the UK, with 310 being directly involved in the production of table and giftware. Again the majority of these firms are based in North Staffordshire and employ fewer than 250 workers, with a significant number employing fewer than 25. This may suggest that small firms propagate both the cluster and the industry, a characteristic consistent with the notion of an 'industrial district'.[10] The reality is that the industry's structure is a hybrid: small and medium-sized firms coexist alongside a few large firms that dominate the industry. For instance, the Waterford Wedgwood and Royal Doulton groups account for a third of total industry output and well over half

of the table and giftware market. As one would expect, the fortunes of these two dominant groups have a critical effect upon the whole industry's performance, while their corporate strategies – on investment, employment and output – have a major impact upon the 'shape' and 'direction' of the industry and the level of ceramic activity within the cluster (see Padley and Pugh, 2000, pp. 16–17).

The present industry structure primarily emerged as a result of rationalisation and a series of mergers and acquisitions in the industry, during the late 1960s and early 1970s (see Gay and Smyth, 1974), with the larger ceramics firms subsequently obtaining public listings. In terms of corporate governance, these changes have had important consequences for the cluster: strategic decision making not only became more concentrated in the leading firms, but was also effectively transferred from hierarchies of local businessmen to more distant corporate hierarchies (usually based outside of the locality) predominantly consisting of city and institutional shareholders. According to Padley and Pugh (2000), these ownership changes resulted in changes in corporate objectives that have had (adverse) implications for the cluster's long-term development. We will return to this issue in Section 2.4.

## 2.2 Recent Trends: Globalisation and the UK Ceramics Industry

Since the early 1980s, the UK ceramics industry has had to face rising international competition, mainly from competitors in the low-wage economies of East Asia. This competition intensified during the 1990s as, in many cases, foreign competitors began to combine relatively low-cost labour with investments in new capital equipment, while taking advantage of a more liberal world trading environment. The competition is expected to intensify even further after 2005, when China joins the World Trade Organisation (WTO) and Chinese manufacturers are allowed greater access to world markets. So far, the main impact of international competition has generally been upon the high-volume, low-value-added part of the table and giftware market (Day et al., 2000, pp. 10–11). However, for UK manufacturers, greater foreign competition has threatened both their traditional export markets (which are mainly in North America and Japan) and crucially their share of the UK market. The situation has been exacerbated by consumer lifestyle changes, with consumers increasingly placing less utility upon using (and purchasing) relatively expensive domestic tableware, and instead preferring cheaper alternatives. This has allowed low-cost foreign operators to increase their market share at the expense of UK firms. Consequently, during the late 1990s, the UK's traditional trade surplus in the table and giftware market

entered into a period of continual decline, falling from £216.3 million in 1996 to £38.9 million in 2001 (Keynote, 2003).

The impact of globalisation and greater foreign competition has contributed to the closure of a number of factories and significant job losses in the North Staffordshire cluster, as the larger UK manufacturers have rationalised and restructured their operations. An indication of the decline in employment is given by the declining membership of CATU, which fell from approximately 23 000 in 1992 to 12 500 in 2002.[11] More recently, the UK's leading manufacturers – notably Wedgwood and Royal Doulton – have begun to pursue a strategy of global outsourcing, utilising production facilities in the Far East. This has become a particularly attractive option since ceramics is a relatively labour-intensive industry and overseas production offers UK companies significant labour-cost savings, enabling them to retain a global competitive advantage (Jackson, 2000, p. 10). Not surprisingly, these strategies have further exacerbated the decline in employment in the cluster, with firms directly substituting foreign for domestic labour. The more high-profile cases involve both Wedgwood and Royal Doulton. In June 2003, Wedgwood announced the closure of two of its Stoke-on-Trent factories, with a loss of over 1000 jobs, and the complete transfer of the production of its Johnson Brothers brand to China (*Staffordshire Evening Sentinel*, 4 June 2003). Royal Doulton has gone even further and in March 2004 announced the closure of its last factory in Stoke-on-Trent, with production being transferred to the company's facilities in Indonesia (*Staffordshire Evening Sentinel*, 26 March 2004).

In addition to these job losses, there have also been concerns about the impact of international competition and global outsourcing upon the cluster's skills base, since the skills of displaced workers are often lost to the industry. For instance, Ceramic Innovations (2003, p. 16) report that a significant proportion of displaced workers have become reluctant to return to the industry, which is increasingly regarded as having a 'poor image, soured by one of insecure and unpredictable employment and a sense of pessimism' (Keynote, 2003, p. 17). These trends have exacerbated the shortage of skilled workers in the cluster such as 'gilders, dish-makers, lithographers, spongers/fettlers and semi-automotive hollow operators' (Ceramic Innovations, ibid.). In response, some firms have adopted a policy that they will only outsource work within the locality to try to protect the skills base, although tightening (labour) cost pressures mean that firms are increasingly seeking to outsource on a global scale (see also Carroll et al., 2002). For smaller firms remaining in the cluster, the growing skills shortages are a serious concern. They raise the locality's long-run average costs (in particular training costs) while diminishing the potential for future productivity gains, thus reducing the cluster's overall competitiveness.

## 2.3 Strategic Decision Making and 'Strategic Failure' in the North Staffordshire Cluster

The effects of global outsourcing have not surprisingly raised concerns about the long-term prospects for the ceramics industry in the North Staffordshire cluster. Such concerns are epitomised in Carroll et al. (2002, p. 341), who argue that global outsourcing threatens not only employment levels, but also long-standing regional ties and the social fabric of the region. There is a general consensus too that the UK industry will not be able to operate as a large-scale industry (with adverse implications for employment levels) as it has done previously, and for stakeholders, such as CATU, the issue has essentially become one of 'managing the decline'. These concerns are very real, particularly as since the mid- to late 1990s the UK industry has experienced a real decline in all the key economic variables – output, employment levels, investment and its trade balance (see Keynote, 2003). The wider impact has also been felt in Stoke-on-Trent, which, in recent years, has also lost a significant proportion of industrial capacity in other manufacturing sectors – most notably through the closure of the region's coalmines and steelworks and also rationalisation in the tyre industry. In attempting to address the problems posed by globalisation upon the North Staffordshire cluster, we return to the issue of corporate governance and consider the role played by the leading firms in the industry. We do so by drawing upon some revealing insights from Padley and Pugh's (2000) comprehensive study of the industry.

According to Padley and Pugh (2000), one of the UK industry's core problems has been that firms have been too eager to divest during an economic downturn. This problem has been exacerbated by the short-term objectives set by the UK stock market, which now primarily governs the industry (see Section 2.1). For instance, during downturns, there has been an increasing tendency for the larger publicly quoted companies to rationalise their operations and cut back upon capacity (possibly in the more innovative areas of the company) in order to improve their (short-run) return on capital. Yet, as Padley and Pugh (2000) go on to point out, such short-term (strategic) decisions often fail to account for the cyclical nature of the industry and can hasten decline since, in subsequent upturns, the industry has insufficient (domestic) capacity to meet rising demand, thus creating a void that has often been filled by foreign imports and/or by UK firms using global outsourcing. The authors contrast this situation with an earlier period 'when the majority of the industry was independent and family owned, they [firms] understood the short-term nature of the cycle and acted accordingly' (ibid., p. 15). By 'acting accordingly', Padley and Pugh (2000) suggest that family-owned firms took a longer-term view (as

opposed to City institutions) and were more likely to invest at the 'bottom of the cycle'. These firms were then able to take advantage of subsequent upturns while, in the aggregate, the cluster was in a stronger position to compete with foreign competition (ibid., pp. 15–17).

In their overall assessment of the industry, Padley and Pugh (2000) are quite clear that the structural changes of the 1960s and 1970s have not been beneficial for the long-term development of the North Staffordshire cluster. Indeed, their study concludes with the rather sober assessment that

> we cannot find one merger in the industry where the whole is greater than the sum of the parts before the companies were merged, whether measured in terms of increased profit, employment, output or the value of the firm. Thus all mergers have led to rationalisation but without the intended benefits. (ibid., p. 28)

From a theoretical perspective, Padley and Pugh's (2000) account is entirely consistent with the predictions of the strategic decision-making approach to industrial organisation: an increasing concentration of economic power among a remote, corporate elite is likely to lead to 'strategic failure' (Cowling and Sugden, 1994, 1998). In this case, the strategic interests of the larger ceramics firms and their associated corporate hierarchies appear to have taken precedence over the long-term development of the North Staffordshire cluster. While reversing this process will not be easy, it is worthwhile to consider some possible ways forward.

## 2.4 Future Possibilities for the North Staffordshire 'Potteries'

At first glance, the challenges posed by globalisation and the current competitive difficulties faced by UK ceramics firms paint a bleak future for the North Staffordshire cluster. However, we would not wish to paint an overly pessimistic picture: pessimism itself can become a self-fulfilling prophecy that can precipitate and extend industrial decline (Padley and Pugh, 2000). Indeed, there can be grounds for optimism. At this point, we should note that on the positive side, the UK industry remains a major player in the global ceramics market with, according to the BCC, a 'critical mass' of firms in all segments of the industry. There are also a number of success stories, most notably in the supply of hotel-ware and in the luxury goods end of the table and giftware market.[12] The cluster itself has inherent strengths, which can be further harnessed to its long-term competitive advantage, the cluster's long-standing tradition in ceramics, its ceramic research centres and expertise, combined with a reputation for quality and design being particularly significant. The 'Made in Stoke-on-Trent/England' back-stamp remains a valuable marketing tool, particularly

in traditional markets.[13] Nevertheless, if the cluster is to have a sustainable long-term future in the global economy, further structural changes and policy initiatives are necessary.

In this respect, advocates of the strategic decision-making approach favour a greater emphasis upon fostering small-firm development and encouraging greater networking between firms within and across localities. The attraction of this approach lies not only in the possibility of emulating the success of various clusters of small firms elsewhere (for instance, the Italian 'industrial districts'), but also in the fact that it may facilitate moves towards a less hierarchical industrial structure and a greater involvement of stakeholders at the local level (and thus reducing the risks of 'strategic failure' (see Cowling and Sugden, 1999)). To some extent, the North Staffordshire cluster is beginning to think along similar lines and has adopted appropriate measures. For instance, at the regional policy level, the issue of governance has become a key area of discussion and changes in attitudes in the cluster are now being openly encouraged: for example, firms are actively being encouraged to engage in far greater co-operation to foster innovation within the industry (ECOTEC, 1999; North Staffordshire Taskforce, 2003). It is also widely acknowledged that the future of the UK industry lies in encouraging smaller-scale production units and that competing on the low-cost, mass-produced wares of the past is no longer a viable option, since foreign operators will always hold an absolute cost advantage. Padley and Pugh (2000, p. 28) argue that in ceramics 'small is beautiful' and – echoing Piore and Sabel's (1984) general thesis – in the new global economy, smaller (ceramics) firms are likely to be more flexible and successful in reacting to changing market conditions.[14]

We would generally concur with such a vision. Indeed, in many respects, the revitalisation of the industry could well be along the lines of going 'back to the future', with an industrial structure resembling something from its earlier industrial heritage. Yet, while we support a stronger small-firm network, we should be quite clear that we do not advocate a cluster where competitiveness is based upon 'sweatshop' or 'Victorian' labour standards. We recognise that, in a relatively labour-intensive industry, labour costs are a conscious concern for all businesses operating in a global market, yet a 'race to the bottom' is not the basis for a successful cluster: indeed, such a strategy is likely to worsen the industry's 'poor image' (particularly for employment opportunities) and exacerbate industrial decline. Rather the focus should be upon engineering a constant sense of dynamism among small firms towards higher-value-added activities, with an emphasis upon aspiring to and setting world-class benchmarks in ceramics: in turn this should result in higher levels of productivity, greater financial rewards and higher wages.[15]

The achievement of a truly evolving, dynamic, innovative cluster of small ceramics firms in North Staffordshire has some way to go before it can become a reality. At the moment, small firms may propagate the cluster, but many are what Rowley (1998) has described as 'survivalists', employing strategies that merely enable them to 'keep their heads above water'. In rising to the challenges of international competition, these firms will have to be more proactive in their competitive strategy, perhaps becoming more design-conscious and giving greater attention to seeking and attaining new markets. For small firms, this transition might be aided through publicly funded initiatives such as the 'Hothouse' project, which was established in 1995 with European Union and local government funding. The 'Hothouse' is primarily a ceramic shape and pattern design centre, equipped with the latest technology which enables users to bring new designs to the market more quickly. It is a centre of excellence and is intended to serve the whole cluster, with all firms being able to take advantage of the centre's facilities (for a set fee) and expertise, without having to incur the high sunk costs associated with investing in specific technologies. The 'Hothouse' project is a welcome initiative, which can facilitate mutual learning, knowledge and technological transfers that are a key facet of any modern successful cluster (Morosini, 2003; see also the chapters by Henry and Pinch and Di Tommaso et al. in this volume – Chapters 5 and 13 respectively).[16] On the subject of collective initiatives, we are somewhat disappointed that, so far, there have been no developments with regard to the suggestion raised by the ECOTEC Report (1999) that a cooperative forecasting, marketing and distribution service be established for the cluster. Small firms often lack the expertise or resources to market and sell products on an international level. Yet, collectively there are significant scale economies that can be obtained from such activities, which could benefit the whole network (Brusco, 1982).

In nurturing a dynamic cluster of small firms, it is also important to foster a spirit of entrepreneurialism and encourage new entrants/investors into the sector, preferably with each entering on a small scale. One possibility here is that new potential entrants may come from the industry's pool of redundant workers from the larger manufacturers (ECOTEC, 1999). Of course, 'entrepreneurs' are not born overnight and, in addition to any financial support available, there is a role here for the region's universities, in collaboration with other public agencies, to develop and support appropriate enterprise and educational programmes for willing entrepreneurs.[17] In addition, an improvement in the industry's (and region's) 'image' is also required to attract and retain new young talent into the sector.[18]

While our focus has been upon fostering a more diffuse system of governance at the industry level, we would also argue that there should be changes at the firm level, with firms moving towards a less hierarchical

system of management than has typically been employed in the past. In particular, firms should seek to encourage their workforce to actively participate in the firm's development and should be rewarded appropriately: good employee relations and a 'feeling of involvement' among motivated employees are increasingly important tenets for success in the modern economy; see also the chapter in this volume by Quintana and Pulignano (Chapter 9). An example of such a ceramics firm that has adopted a 'flat' management structure is Moorcroft PLC, a small/medium-sized company, which specialises in producing and designing high-quality table and giftware. Although it is a publicly listed company, the majority of Moorcroft's shares are retained locally by the Edwards family (Keynote, 2003), and the firm operates (and encourages) an employee share ownership scheme. The philosophy at Moorcroft is that 'status' itself is not important: there are no company cars, for instance, and management itself is seen as an overhead, with employees being regarded as the firm's wealth creators.[19] An open dialogue between managers and employees exists, with conscious efforts made to involve the latter group in all aspects of decision making (Edwards, 2000). The company also encourages employees to develop new skills and pursue new ideas. In terms of financial rewards, the company embraces profit sharing, while wages and piecework rates are all above the industry norm.

The formula appears to work: Moorcroft is a very successful ceramics company, manufacturing much-sought-after wares that are world renowned for both quality and originality in shape and pattern design (Keynote, 2003). These products are designed and manufactured solely in Moorcroft's Burslem factories: global outsourcing is not considered a strategic option for the firm – it might 'devalue' the product's quality in the eyes of the consumer. Consequently, while other ceramics firms have been reducing their domestic employment levels, Moorcroft's labour force has risen from 17 in 1986 to just over 200 in 2001 (Keynote, 2003). Furthermore, the company's labour productivity levels are approximately twice the industry norm (Edwards, 2000). Moorcroft's approach might, therefore, be an example to other small firms in the industry: indeed the company's relatively successful performance suggests that it is possible for smaller firms to thrive in the North Staffordshire cluster.[20]

In summary, the North Staffordshire cluster faces some important challenges, particularly in the face of increasing international competition. Further structural changes are likely and the growth in global outsourcing by the larger manufacturers will have a significant (negative) impact upon employment levels within the industry. Indeed, given that the majority of employment is within the sector's larger firms, then current employment levels are particularly vulnerable. This will have implications for morale within the

industry and could adversely affect the cluster's skills base. Yet the pottery industry has traditionally been the 'focal point' of Stoke-on-Trent and it can play an important part in the region's future economic development. In order to do so, however, it is important that the cluster, collectively, takes positive action to respond to the challenges posed by globalisation. We have suggested some possible ways forward, with a greater emphasis upon less hierarchical production modes, greater cooperation between all industry stakeholders, and small-firm networking. If the city can retain and enhance its reputation as a centre for ceramic activity – based upon art, creativity and innovation – then this will not only improve the industry's image, but will also attract other firms and industries in related fields into the region, while also having benefits for the growing tourist sector.

## 3. CASE STUDY 2: THE PRATO TEXTILE INDUSTRIAL DISTRICT

### 3.1 History, Institutions and Industrial Structure

The textile and clothing industries[21] were one of the earliest manufacturing activities undertaken by European countries, the sector's growth primarily being driven by evolving fashion tastes, lower input prices and technological change. The transformation of raw cotton, wool, silk and flax provided a fundamental contribution to the development of craftsmanship in medieval cities, which remains within today's industrial districts. In Italy, in particular, the production and transformation of silk and the manufacture of cotton or woollen products supported the rise of the first industrial family-owned firms. During the twentieth century, and particularly following the Second World War, the number of firms undertaking complementary activities rose and began to cluster around earlier industrial establishments, such as the textile region of Prato in Tuscany. In the north and centre of Italy, this industrial awakening occurred in parallel with the mechanisation of agriculture which released a pool of skilled and experienced labour for the textile industry.[22]

Not far from Florence, Prato is the most important textile and clothing district in Italy, with 7400 firms[23] and 43 000 workers.[24] Historically, the manufacturing of textiles can be traced back to the twelfth century, when the production of clothes was regulated by the 'Corporazione dell'Arte e della Lana', the Guild of Art and Wool. The transition from artisan workshops to the factory occurred during the second half of the nineteenth century, largely due to the introduction of a number of innovations which promoted the mechanisation of textile factories. Later, the local industry received a

stimulus by military commissions, tariffs and the economic autarchy that was in place during the 1930s. The industry's economic 'boom' occurred later, after the Second World War. Between 1950 and 1981 the number of employees in Prato's textile industry rose from 22 000 to 60 000, while in other European regions the sector underwent stagnation and rationalisation. Prato was acknowledged as being a successful example of an industrial district, where firms are mainly family-owned and of very small size.[25,26] The longstanding tradition of production of woollen tissues, concentrated within an area of 700 $km^2$, created the conditions for the emergence of a social and economic system based upon a network of relationships that promoted and facilitated information flows, knowledge transfers, cooperation among firms and, through agglomeration economies, reduced firms' average costs.

Ironically – and contrary to traditional views that 'conflict' is absent in industrial districts – Dei Ottati (2003) has argued that the collective spirit that embodies the Prato district arose mainly out of tensions among the region's economic actors (mainly between the large mill owners and workers) during the 1940s. This occurred during the demand crises of 1948 which resulted in the lay-off of thousands of workers.[27] However, these lay-offs were accompanied by positive proposals (with accompanying financial support) to encourage the district's most skilled workers to become self-employed. According to Dei Ottati (2003, p. 504) 'within a short period of time, the structure of the Prato industry changed radically. With the vertical deintegration of the larger mills, the system based on the division of labour among specialised firms became the dominant one'. The massive exit of labour towards self-employment populated the local system with thousands of 'phase firms', firms specialised in one or two phases of the production process that gave rise to a complex system of 'interconnected local phase markets' mostly undertaking subcontracting activities (Dei Ottati, 2002, p. 451). As a consequence, prices for weaving and other operations dropped substantially, which led to Prato's self-employed workers organising their 'collective voice' through local artisans' associations.

This story of the behaviour of economic actors (namely final firms, 'phase' firms, workers, intermediate associations and local government) in response to demand fluctuations and subsequent periods of crisis denies the quite diffused 'harmonic' view of the industrial district, where actors reciprocally cooperate with each other while also competing. Moments of economic crises have recursively emphasised that actors retaining strategic decision-making power would individually pursue their own interests and objectives even if these were not in the wider public interest. However, as Dei Ottati (2003) emphasises, when 'individual voice' was not effective, it was the organisation and exercise of a 'collective voice' which contributed to the search for alternative solutions and mediation of the region's collective

interests. This represents an important lesson in the evolution of Prato's governance structure, an issue we will return to below.

### 3.2 Recent Trends: Prato's Industrial Crisis and International Competition

After 30 years of expansion (from 1950 to 1980), the Prato industrial district has, in line with other European textile industries, undergone a long period of economic rationalisation. While Prato's industrial restructuring has been relatively less severe than that of its European neighbours,[28] the region has, nevertheless, experienced a significant decline in both textile employment and the number of firms operating within the district (see Table 11.1). A number of factors have contributed to these trends. First, there has been a change in consumer demand patterns: household heating and the diffusion of different lifestyles have shifted consumers' preferences towards lighter materials such as flax, silk and cotton, and away from carded woollen textiles, in which Prato held a comparative advantage. Second, the larger textile firms introduced new technologies which increased the flexibility of their large-scale production processes. This allowed them to compete more directly with district firms, who found themselves at a distinct disadvantage. Finally, there has been increased competition from the so-called newly industrialised countries, where textiles and clothing products can be produced at lower labour costs (see below).

*Table 11.1 The textile and clothing industry in the Prato district: number of firms and employees, 1980–2002*

| | 1980 | 1996 | 2000 | 2002 |
|---|---|---|---|---|
| Firms | 16 000 | 9 600 | 9 000 | 8 600 |
| Employees | 60 000 | 50 000 | 45 000 | 43 000 |

*Source*: ISTAT and Unione Industriale Pratese, UIP.[29]

As a response to the industrial 'fallout', Prato's regional government began, in 1987, to activate a number of social policies, such as improving job mobility and introducing retraining schemes to mitigate the effects of declining textile employment for the region's labour force. The cooperation of both firms and unions in this phase of industrial restructuring was crucial, particularly in managing the labour market situation. As Dei Ottati (2003, p. 513) points out, 'positive results were obtained thanks to deliberate concerted action aimed at governing the massive exit of workers, whose aggregate effects would have been harmful to social cohesion, the latter

being an indispensable element for district survival'. Furthermore, and in retrospect, the carded wool crises enriched the product specialisation of firms, which became more market-oriented. Today, the product mix comprises knitted wool, cotton, viscose, flax and silk.[30] This change was also reflected in the reorganisation of production inside the district. The number of small artisan shops has significantly decreased, while final firms, in particular, have started to establish subcontracting agreements with phase firms outside the Prato district. Purchasing strategies have changed as well, with most of the fibres and yarn now being procured from external suppliers located in countries with lower labour costs. It is not by chance that Prato hosts one of the largest Chinese communities in Italy, which is engaged in the clothing industry. Chinese firms take on production phases that require 'very fast work', such as machine sewing and ironing of clothes. As a recent study emphasises,[31] this has contributed to a replacement of 'activities' that were decentralised in the south of Italy or abroad, and has brought them back inside the district.[32]

The presence of Chinese subcontractors is, in some respects, controversial. On the one hand, they may be regarded as being indispensable for the survival of the Italian textile industry and the 'Made in Italy' brand label, since they provide an opportunity to lower the costs of production and shorten the lead-time for orders that traditional Italian firms are not able to or do not wish to meet. At the same time, the 'ability' of the Chinese subcontractors to meet these 'standards' imposes social costs, since it invariably involves the exploitation of labour (mainly family members) under working conditions that sometimes cross the borderlines of legality (Ceccagno, 2003). Indeed, at this level, Chinese subcontractors often fiercely compete against each other, with many firms failing to survive: the annual firm volatility rate amounts to 35 per cent. This might suggest that the 'activities' brought back into the district by these firms are of the 'sweatshop kind' and do not enrich the opportunities of the district to re-launch its production with, for instance, new diversified and higher-value-added products. However, there are signs that the second generation of Chinese immigrants are developing their activities with an eye on selling a final product to the market, as opposed to being low-cost subcontractors.

More recently, the sector has again been affected by a marked reduction in consumer demand and declining export markets. Between 2000 and 2002, employment fell by 4.4 per cent, while the total production of yarn, textiles and clothing decreased by 7.5 per cent (see Table 11.1 and also Table 11.2). In 2002, exports were €3 billion (60 per cent of total output), although this was 6 per cent less than in 2000. The reduction of consumer demand for clothing has had an impact upon the district's activities and the organisation of production within. There are increasing demands upon

firms for shorter lead-times with respect to new orders and the district has experienced alternating phases of under- and over-utilisation of plants (UIP, 2003). Moreover, international competition has become particularly fierce: in 2002, world exports in textiles and clothing amounted to €350 billion (6 per cent of all world trade flows), with 50 per cent of these being serviced from developing countries (70 per cent for clothing).[33] In this respect, the ongoing liberalisation of trade which has ended in 2005 with the exhaustion of the MFA (Multifibre Arrangement) has exposed so-called developed market economies to competition from a large number of transition and developing countries, especially from Asia. Between 1990 and 1999 the degree of import penetration in the EU has increased from 12 per cent to 23 per cent in textiles and from 30 per cent to 46 per cent in clothing (Stengg, 2001, p. 3). The clothing industry is relatively more labour intensive than textiles and it is here, particularly, where low-cost operators from countries such as China (and to some extent India) have been able to take advantage of significantly lower costs to undercut their Western rivals.[34] The growth in international competition poses a real challenge for the Prato district, and it is to this issue that we now turn.

*Table 11.2 Recent production trends in the Prato district (textiles and clothing: turnover, €millions)*

| | 2000 | 2002 | Var. (%) |
|---|---|---|---|
| Fibres and spinning | 880 | 750 | –14.77 |
| Fabric manufacture | 3240 | 3150 | –2.78 |
| Knitwear and clothing | 1340 | 1150 | –14.18 |
| Total T&C | 5460 | 5050 | –7.51 |

*Source*: Authors' elaborations on UIP data.

### 3.3 The 'Global' Textile and Clothing Industry: a Scenario for International Networking?

One response to the challenges of globalisation has been a move towards greater consolidation within the Prato district through the creation of groups of firms linked by ever closer financial ties. According to Dei Ottati (2003, p. 517), these new arrangements have allowed firms to coordinate their activities and introduce new process and product innovations more effectively, since ownership – as a coordination mechanism – is a much quicker means by which firms can react to changes in market conditions, as opposed to relying upon traditional relationships (between many firms)

which were based upon nurturing trust. Nevertheless, these ownership changes have had an effect upon the nature of production activities within the district. In particular, it has been argued that this rising concentration will lead to a reduction in the number of final firms (as opposed to phase firms),[35] which specialise in the design and marketing of products, while production is, in turn, contracted out to other smaller firms.

The direction that has been taken for the textile and clothing sector points to the evolution of a structure where a few large client firms lead production decisions and compete on the international market. The production of fibres, yarn preparation and fabric manufacture, undertaken by phase firms, would therefore be orchestrated to serve the competitiveness of a few well-known clothing firms that, using their internationally renowned brand names, organisational capacity and experience, could successfully compete in the global marketplace and thus guarantee the district with a substantial demand flow:[36] this may provide the district with an opportunity to reinvigorate itself. This scenario, which has in part already been implemented, could be the viaticum through which the industry finds systemic coordination and a common strategy that creates the conditions for a substantial reorganisation of the industry. We suggest that this perspective is essentially about networking and, in particular, it envisages the restructuring of the industry by means of 'networks of direction', that is, networks of firms where coordination is achieved by replicating a hierarchical organisational structure among firms (Sacchetti and Sugden, 2003). Economic planning would be retained by a few large client firms, which would organise production and thus rely upon a qualified substratum of subcontracting firms, which follow their instructions. At the moment, this kind of networking appears to be the only strategic approach to counter the process of deindustrialisation that is currently afflicting Prato. Small and medium-sized firms have been losing out to international competition, so the new arrangements potentially offer a guaranteed demand flow, while the larger firms will be able to procure high-quality products (with high design standards), which are consistent with their own brand image.

The main risk in Prato's industrial restructuring process is that it will lead to a concentration of strategic decision making among an elite subset of firms within the district. As has occurred in other regions, the wider social interests of Prato may become peripheral to the strategic objectives of the new elite, raising the possibility of 'strategic failure'. For instance, with increasing globalisation, there is no guarantee that Prato's smaller firms will benefit from large-firm procurement. Indeed, the larger firms might increasingly seek to outsource production to overseas subcontractors, where factor prices are lower, as occurred during the late 1980s and early 1990s, in response to growing international competition. This outsourcing

was predominantly in Eastern Europe and North Africa, as opposed to Asia, mainly because of the region's geographical proximity and the higher-quality standards in production (Stengg, 2001, p. 4). Yet, as technological advances in Asia continue to improve (and with falling transport costs), the opportunities for global outsourcing are increasing, which in turn may threaten the future vitality of Prato.

The challenge for both Prato's business community and policy makers is to reverse the decline in firm numbers and employment opportunities, while also preventing the industry from becoming dominated by a few large client firms. This might be achieved if a margin of strategic decision-making power can be retained by local firms and institutional actors. One possibility is the active promotion of networks where relationships are based upon reciprocity and where dependence is mutual (see Sacchetti and Sugden, 2003). The idea is to organise and coordinate production processes within and outside the district through networks whose strategy is jointly decided by those actors affected by the outcomes of decision making. We might, therefore, envisage the creation of points of coordination inside the district which are identified not only with the large client firms, but with other affected parties. In this respect, Prato may be able to rely upon its past experience, since historically, social cohesion has played an important role in the region's development. This has involved trade unions, the association for large manufacturers, intermediate associations for the representation of self-employed workers and local governmental agencies depending on the type of problem to be solved.[37] The Prato experience, in particular, has shown that the mediation of local interests, the notion of 'fairness' and the discouragement of destructive forms of competition (such as 'cut-throat' competition to drive down the prices paid to subcontractors) were not spontaneous outcomes deriving from inter-firm cooperation (Dei Ottati, 2002). Rather, rules of behaviour were continuously redefined through local bargaining.[38] In the future, these experiences might be useful in guiding Prato's industrial strategy and safeguarding its productive specialisations that are crucial to its international competitiveness. Furthermore, to avoid the risk of strategic failure, it is vital for intermediary institutions and the local government to continue being active partners in industrial development.[39]

More generally, networking also implies that any industrial restructuring proceeds in accordance with some main priorities (see European Commission, 1997). First, it is important to create a flexible labour force, able to cope with 'old' and 'new' tasks required by the new organisation of production: this might, for instance, imply a wider and more diffuse use of information and communcation technologies (ITC) with other firms inside or outside the district area. Second, networking is consistent with the objective of developing and disseminating new products, methods and equipment,

including distribution, as it promotes the exchange of knowledge among producers through the whole production process (from yarn production to the design, preparation and production of garments). Third, networks can be at the forefront of high-quality standards in production and set the rules under which firms have to comply, thus 'ensuring a high level of protection for consumers and the environment' (ibid., p. 4). Fourth, networks represent a modality of production organisation that goes beyond clustering, as it is not confined to a geographical area but it promotes linkages within and across regions and nations – within the single European market but also outside it. By definition, this type of 'openness' implies that the organisation of production could involve firms located in developing countries. In order to avoid problems associated with firms exploiting low-cost labour, these types of open networks may have to be policed by an insistence on 'strict compliance with the rules and disciplines which have been freely accepted under international agreements' (ibid., p. 4).

At the local level, policy intervention has been trying to achieve some positive results through promoting the innovative capacity of firms. In this respect, funding has been made available through the EU Objective 2 Fund. It has primarily been oriented towards the improvement of infrastructure that supports textile manufacture, for instance into the development of new technologies for the treatment of the water used by textile firms. This project is supported by a network of actors coordinated by 'Tecnotessile', a service company for technological development in the Prato region. Firms, local universities, local business associations and public agencies within the network are all involved in the project. Other policy initiatives have also been supported through the same system. In essence, the local network has implemented projects for industrial research aimed at improving SMEs, technological innovation and for the development of ICTs (for further details, see Regione Toscana, 2003).

The turning point for the future of the Prato district will be in 2005, with the end of import quotas that were introduced in 1974, under WTO supervision. In a sense, the actors who will affect the future of Prato are not only local producers but also those of other countries. Policy action is therefore likely to be required both at the national and EU level, for setting clear and reciprocal rules to avoid the unwanted phenomenon of social and environmental 'dumping'. This would allow Italian (and also European) textile and clothing firms to compete on the quality of products, without compromising safety and environmental standards. In the face of the troublesome implications for Western countries (Europe, the USA and Canada), those who see the abolition of the Multifibre Arrangement as positive forecast increases in the scale of industry and estimate gains of around $2 billion per year in India from increasing productivity by 67

per cent in the clothing sector, which will bring it roughly into line with China (Kathuria et al., 2001, p. 21), and impressive lowering of consumer costs (François et al., 2000). In summary, the scenario for the textile sector in Prato, and elsewhere, is a difficult one. The restructuring of activities will probably cause the closure of more firms and there will be a further reduction in employment (mainly female employment).[40] However, if a new entrepreneurial spirit emerges, it could inject new energies into the locality, by bringing new abilities and an attitude to cooperation that exceeds local geographical spaces.

## 4. CONCLUDING COMMENTS: LESSONS LEARNED

The North Staffordshire ceramics cluster and the Prato textile district are two of Europe's oldest industrial clusters, with a long history in the design and manufacture of high-quality ceramics and clothing garments respectively. However, the future for these traditional clusters has become increasingly uncertain, as globalisation and global outsourcing, combined with the growth in international competition (particularly from low-cost operators in Asia), threaten the long-term viability of these relatively labour-intensive industries in each region. In response to these challenges, each cluster has had to readjust and has begun to undergo significant structural change. This has sometimes been painful, with the ensuing reduction in the number of firms and the level of employment. Furthermore, structural change alters the nature of governance in each cluster. As we have argued and as is clearly highlighted in each case study, the issue of governance matters in that those who control an industry's strategic decisions effectively determine a cluster's and/or locality's long-term direction and economic development.

In considering the wider implications of globalisation and structural change, each of these localities can possibly learn from each other's recent experiences. For instance, in North Staffordshire, it is becoming increasingly recognised (particularly among policy advisers), that the 'old' modes of industrial hierarchy are unlikely to be successful, and that the future vitality of the cluster depends upon greater cooperation and networking between actors within (and perhaps outside) the locality. These changing perceptions are partially in recognition of the successful nurturing of the traditional Italian 'industrial districts' where the issue of governance has long been addressed in favour of less hierarchical modes of production. If, as Padley and Pugh (2000) suggest, the future of North Staffordshire ceramics lies in encouraging an entrepreneurial cluster of small-firm production, then perhaps there are lessons to be learnt from the earlier development of Prato's small-firm sector. In Prato, the locality's 'collective voice' led to a positive

policy response that laid the foundations for a new set of entrepreneurs to emerge following the cluster's industrial crisis of the 1940s (see Section 3.1). While the present industrial 'shake-out' affecting North Staffordshire's larger firms is disconcerting for both workers and the wider community, it may provide a greater imperative for a similar re-focus in industrial policy making, perhaps towards nurturing the cluster's fragile small-firm base.

Similarly, Prato can learn from the experience of North Staffordshire. The recent moves in the Prato district towards a greater consolidation of production and a reduction in the number of 'final firms' possibly echoes the 1960s merger wave in the North Staffordshire cluster. This merger wave not only significantly reduced the local economy's (ceramic) small-firm base, but it also altered the nature of governance in the cluster which, in turn, has exacerbated the present industrial crisis (see Sections 2.2 and 2.3). As we have argued in this chapter, if Prato is to avoid a similar mistake and the spectre of 'strategic failure', then the challenge for its local policy makers, in the face of continual structural change, is to seek ways in which a significant degree of strategic decision making can be retained within the locality.

Finally, we would argue that the future for both clusters is in seeking to establish and maintain world-class standards/benchmarks in the manufacture of ceramics and textiles respectively. In the global economy, there is little to be gained from manufacturing mass-produced wares or garments, where low-cost operators from the Far East have secured a comparative (labour) cost advantage. Rather, the future prosperity of each region depends upon a combination of successful marketing and continual innovation in art, design and technology to produce high-value-added products for the world market. To achieve such a favourable scenario, we envisage a positive role for networks, institutions and public research units. Here, Prato has an inherent advantage, since such bodies have long underpinned the region's economic development. In North Staffordshire, attitudes are becoming more favourable towards such institutions: the 'Hothouse' project has been a welcome step forward, although, as we have noted, similar initiatives are required to improve and sustain the cluster's long-term competitiveness.

In conclusion, the case studies in this chapter highlight, more generally, some of the challenges currently facing traditional industrial clusters in Western economies. While such clusters can survive and indeed prosper in the global economy of the twenty-first century, it is apparent that this can only be achieved by first considering the nature of the governance structures that impact upon the respective localities. It is our view that such an appraisal is a prerequisite in the formulation of appropriate policy initiatives, which aim to mitigate the negative effects of increasing globalisation upon a locality's development. Furthermore, a review of governance structures, combined

with positive moves towards a diffusion of strategic decision making within a locality is more likely to serve the wider public interest.

# NOTES

* We would like to thank Geoff Bagnall, General Secretary of the Ceramic and Allied Trades Union (CATU) and Kevin Farrell, Chief Executive of the British Ceramic Confederation (BCC) for providing time for interviews in connection with this research.

1. On this issue, the debate has divided between scholars who believe that it is possible through policy action to replicate the organisation of production and labour that has been observed within certain districts and others who, on the contrary, are convinced that districts represent locally embedded experiences that, given the influence of cultural and historical processes for the evolution of behavioural rules, cannot be replicated everywhere (see, for example, Amin, 1989).
2. Indeed, and particularly pertinent to our study, it is interesting to note the following comments from a recent report of the North Staffordshire Taskforce (2003, Section 2.9): 'whilst funding constraints will always arise, a key issue to address is that of governance, both within the private and public sectors, and within civil society. This issue is pivotal to an understanding of both the problems and opportunities of North Staffordshire'. Furthermore, it is apparent that governance issues have begun to underpin recent European Union directives: see, for instance, the European Commission's (1997) directive on networking in relation to the textile industry (see Section 3.3).
3. On the notion of the public interest, see Long (1990). In particular, according to Long (1990, p. 171), the 'public interest' is defined as an evolving consensus among a set of people (a public) regarding private actions. Private actions are then assessed according to the standard agreed upon by the public. It is argued that the 'consequences of private parties' actions create a public interest as that public discovers its shared concern with the effects of private actions and the necessity for their control.
4. For a historical account of the development of the North Staffordshire potteries, see Thomas (1971).
5. Stoke-on-Trent was granted city status in 1910 and comprises six pottery towns – Longton, Fenton, Stoke, Hanley, Burslem and Tunstall. These towns provided the setting for many of the widely acclaimed novels of the (locally born) author Arnold Bennett, including *Clayhanger* and *Anna of the Five Towns*.
6. Data obtained from Stoke-on-Trent City Council (http://www.stoke.gov.uk). It is worth noting that the proportion of the local population directly employed in the ceramics industry has been in continual decline. In 1938, over half of the city's workforce were employed in the industry. By 1974 this figure had fallen to just over a third (Gay and Smyth, 1974, pp. 13–14).
7. The city attracts approximately 2.6 million annual visitors – 60 per cent primarily attracted by the 'pottery shopping' experience (ECOTEC, 1999).
8. The other main industry bodies whose headquarters are in the city are the Association for Ceramic Training and Development, the British Ceramic Plant and Machinery Manufacturers' Association, CERAM Research Ltd and the Ceramic Industry Forum.
9. This statement can be supported by reference to employment data in the industry: in the production of ceramic tiles, flags and sanitary ware, the North Staffordshire cluster accounts for 40 per cent of total UK employment; this figure rises to 60 per cent in both industrial ceramics and refractory products and then to approximately 80 per cent in the table and giftware sector (data provided by the Department of Trade and Industry (DTI) (http://www.dti.gov.uk/clusters/map/graphics/westmid.pdf)).
10. For a discussion on the literature on industrial districts and the North Staffordshire cluster see Day et al. (2000). More general discussion of the industrial districts literature

can be found in other chapters in this volume, for example those by Pitelis and Pseiridis (Chapter 2), Bellandi (Chapter 4) and Parrilli (Chaper 10).

11. These data are provided by CATU. They are a useful indicator of the decline in employment since union density is approximately 100 per cent (Carroll et al., 2002).
12. For instance, in hotel-ware, Stoke-based companies such as Steelite and Dudson have been successful in developing close long-term (and profitable) relationships with their clientele.
13. Concerns have been raised about the issue of 'back-stamping', where firms produce their wares overseas, and then place a 'Made in Stoke-on-Trent/England' transfer on the finished product at their Stoke factory. The legalities of this issue are often complicated and controversial (Carroll et al., 2002). At a macro level, the region's local MEP, Michael Cashman (2003), has been campaigning for greater international regulation and policing on the 'back-stamp' issue. He suggests that 'back-stamps' be applied where the product was originally fired. It is argued that such a move would provide consumers with greater information and might ensure a 'fairer' international competition (and reduce counterfeits) in ceramics.
14. See also the discussion in Pitelis and Pseiridis in this volume (Chapter 2).
15. It is interesting to view the argument that benefits might be generated from returning to an earlier industrial structure in the light of Parrilli's observations in Chapter 10 with regard to there being a series of 'stages' that clusters pass through. While Parrilli uses this to justify optimism on the part of so-called 'survival clusters' in less developed countries, these arguments may provide an extension to such an approach in the sense of there being a 'stage too far'; see also the later analysis of the Prato cluster.
16. As always there is the public goods issue of 'access' to such facilities, and there is always a danger that larger corporations might 'crowd out' smaller firms, as in the case of the Japanese Public Testing and Research Centres (see Cowling and Tomlinson, 2003, p. 40). Our wish is that such facilities are particularly made accessible to smaller firms within the cluster. Bellandi, in Chapter 4, discusses public goods in the context of clusters in some detail.
17. For an in-depth discussion of ways to nurture an entrepreneurial society, see Gavron et al. (1998).
18. Admittedly this is a long-term problem, and is a consequence of the current pessimism relating to the industry's present situation, but there is no reason why the industry's image may not be improved if appropriate initiatives are taken.
19. A simple example of this principle in practice is that Moorcroft only allows its designers and employees to appear in publicity shots of Moorcroft pottery: management and directors are not allowed to do so (Edwards, 2000).
20. It is worth noting that during the early 1980s, Moorcroft had twice been close to bankruptcy before being purchased by the Edwards family in 1986. The subsequent organisational changes – initiated by the new owners – towards a 'flat' management structure and the generation of a 'family-orientated atmosphere' within the company are in sharp contrast to structures evident in the larger ceramics firms (and, indeed, British industry more generally).
21. The textiles and clothing sector comprises firms involved in production in a number of markets and sub-markets. These are primarily (a) the extraction and preparation of raw materials (wool, raw cotton, artificial and synthetic fibres, etc.); (b) manufacturing processes (spinning, weaving, knitting, finishing); (c) the production of final products for the clothing industry (standard garments, fashion and luxury garments); (d) other final markets such as the household industry (furnishing, carpets) and industrial goods (such as belting, high tech materials for sailing). For further information see Dicken (2003, pp. 317–19).
22. A significant number of this new labour force were women from rural areas, who had domestic experience of textile processes, such as preparing the yarn, weaving, and making the family clothes.
23. Source: Infocamere-Movimprese (2004).
24. Source: Unione Industriale Pratese (UIP, 2004).

25. In Prato, only 1 per cent of firms have over 50 employees; 14 per cent are classed as small firms (10–49 employees), and 85 per cent are micro firms (1–9 employees). (Source: ISTAT, 1996.)
26. In 1996, the average number of employees in Prato firms was 7 (source: authors' elaborations on ISTAT). By comparison, in 1999, the average textile firm in the EU had 12 employees (source: authors' elaborations on Eurostat, 2004).
27. Between 1945 and 1948 the number of employees rose from approximately 10 000 to 22 000 workers. However, in 1948 the vertically integrated mills lost their export markets in South Africa, India and the Middle East, due to the introduction of protectionist policies in these countries and also to changes in the patterns of international trade after the war (see Dei Ottati, 2003).
28. Since the early 1980s, other European textile and clothing regions, such as Nord Pas de Calais in France, Tilburg in the Netherlands, the North West of England and Baden-Württemberg in the south-west of Germany have also undergone significant industrial restructuring with resulting falls in employment levels. Indeed, throughout the EU, between 1980 and 1995, the decline in employment was 47 per cent in textiles and 40 per cent in clothing (Stengg, 2001, p. 3). Over the same period, Prato has experienced a more moderate 17 per cent fall in employment.
29. ISTAT (1996). These are the latest national figures available from the national census office. More recent data are derived from the Unione Industriale Pratese (UIP) (2003).
30. It should be noted, however, that while Prato's entrepreneurs have diversified their products by looking to manufacture 'lighter tissues' of wool or by addressing new market segments such as the production of technical fabrics and garments, the core business in Prato remains the manufacture of woollen fabrics (indeed, the production of raw fibres and yarn preparation amounts to merely 15 per cent of total turnover, while the clothing industry accounts for 23 per cent – woollen fabrics account for the remainder).
31. See Ceccagno (2003).
32. With a presence of 10 000 people, the Chinese constitute 5 per cent of the inhabitants of Prato (population 190 000). The Chinese own 1500 firms, mainly undertaking subcontracting activities in the clothing sector. Prime contractors usually do not exceed three or four firms.
33. Data from the European Commission (2003).
34. For instance, in 1998, there were wide hourly wage differentials in the clothing industry. In Germany, for instance, hourly wage rates were US$18.00 but this dramatically fell to US$2.77 in Poland, US$1.36 in Morocco, and US$1.04 in Romania. In China, India, Indonesia, Pakistan and Vietnam labour costs are under US$0.45 per hour (source: ILO, 2000, p. 41). The average hourly wage in Italy for workers in textile and clothing was approximately US$17.00.
35. See Dei Ottati (2002) for the distinction between 'phase' and 'final' firms.
36. This might be compared also with the structure of the car industry cluster in the south of Italy set out in the chapter by Quintana and Puligano (Chapter 9), for example.
37. See Dei Ottati (2003) for an application of exit and voice strategies within the Prato district.
38. For example, the agreement on procedures and initiatives to improve relations between commissioning firms and subcontractors in the Prato textile district, signed in 1997.
39. See, for example, the strategic policy objectives declared by local institutions for the promotion of textiles and the development of the district (Caloffi, 2002). See also the chapter by Aranguren et al. in this volume (Chapter 12), where similar arguments are made regarding local development agencies in the Basque Country region of Spain.
40. The percentage of women in textile employment is between 40 and 60 per cent in Italy, the UK, Spain, Austria and Greece. Central and Eastern European countries (plus Portugal) have between 60 and 80 per cent of female workers in their staff. The role of women is even more important in clothing, 'with women taking up 74 per cent of the jobs in clothing worldwide' (1995 figures; source: ILO, 2000, p. 25). However, between 1985 and 1995 the share of women employed in the European clothing industry dropped from 81 to 76 per cent, and in Italy this reduction included an actual employment loss of 80 000 female employees (ibid., p. 25).

# REFERENCES

Amin, Ash (1989), 'A model of the small firm in Italy', in E. Goodman, J. Bamford and P. Saynor (eds), *Small Firms and Industrial Districts in Italy*, London and New York: Routledge.

Branston, J.R., Rubini, L., Sacchetti, S., Sugden, R., Wei, P. and Wilson, J.R. (2003), 'The development of local economies and the possible impact of public policy: a framework for case studies', L'institute Discussion Paper No. 20.

Brusco, S. (1982), 'The Emilian model: productive decentralisation and social integration', *Cambridge Journal of Economics*, **6** (2), 167–84.

Caloffi, A. (2002), 'Iniziativa locale per il rilancio del settore tessile e dello sviluppo distrettuale' *Newsletter*, Club dei Distretti Industriali (4/1/04), http://www.clubdistretti.it.

Carroll, M., Cooke, F.L., Hassard, J. and Marchington, M. (2002), 'The strategic management of outsourcing in the UK ceramic tableware industry', *Competition and Change*, **6** (4), 327–43

Cashman, M. (2003), 'Ceramics backstamping' (An article for the CBI) http://www.michaelcashmanmep.org.uk/campaigns.asp.

Ceccagno, A. (ed.) (2003), *Migranti a Prato. Il distretto tessile multietnico*, Milan: Franco Angeli.

Ceramic Innovations (2003), *Sector Workforce Development Plan*, http://www.actd.co.uk/CINN/workfporce.htm.

Cowling, K. and Sugden, R. (1994), *Beyond Capitalism, Towards a New World Economic Order*, London: Pinter.

Cowling, K. and Sugden, R. (1998), 'The essence of the modern corporation: markets, strategic decision-making and the theory of the firm', *The Manchester School*, **66** (1), 59–86.

Cowling, K. and Sugden, R. (1999), 'The wealth of localities, regions and nations: developing multinational economies', *New Political Economy*, **4** (3), 361–78.

Cowling, K. and Tomlinson, P.R. (2003), 'The problem of regional hollowing out in Japan: lessons for industrial policy', in R. Sugden, R.H. Cheng and G.R. Meadows, *Urban and Regional Prosperity in a Globalised New Economy*, Cheltenham: Edward Elgar, pp. 33–58.

Day, M., Burnett, J., Forrester, P.L. and Hassard, J. (2000), 'Britain's last industrial district? A case study of ceramics production', *International Journal of Production Economics*, **65**, 5–15.

Dei Ottati, Gabi (2002), 'Social concentration and local development: the case of industrial districts', *European Planning Studies*, **10** (4), 449–66.

Dei Ottati, Gabi (2003), 'Exit, voice and the evolution of industrial districts: the case of the post-World War II economic development of Prato', *Cambridge Journal of Economics*, **27** (4), 501–22.

Dicken, P. (2003), *Global Shift: Reshaping the Global Economic Map in the 21st Century*, London: Sage.

ECOTEC (1999), *A Strategic Analysis of the Ceramics Industry in Staffordshire*, Birmingham: ECOTEC Research and Consulting Limited.

Edwards, H. (2000). 'How do I turn on my workforce?', in I. Jackson, S. Leech, M. O'Keefe and L.Trustrum (eds), *Ceramic ambitions and Strategic Directions: Perspectives on the UK Ceramics Industry*, Stoke-on-Trent: Staffordshire University Business School, pp. 62–4.

European Commission (1997), 'Plan of action to increase the competitiveness of the European textile and clothing industry', *Communication from the Commission*, COM(97) 454 final.

European Commission (2003), DG Commerce, Conference on 'The future of the T&C industry after 2005', Brussels, 5–6 May.

Eurostat (2004), *Textile and Clothing. Statistics*. Last update: 10 May 2005, accessed 5 July 2004, http://europa.eu.int/comm/enterprise/textile/statistics.htm.

François, J.F., Glismann, H.H. and Spinanger, D. (2000) *The Cost of EU Trade Protection in Textiles and Clothing*, Working Paper No. 997, Kiel Institute of World Economics.

Gavron, R., Cowling, M., Holtham, G. and Westall, A. (1998), *The Entrepreneurial Society*, London: Institute for Public Policy Research.

Gay, P.W. and Smyth, R.L. (1974), *The British Pottery Industry*, London: Butterworths.

ILO (International Labour Organization) (2000), *Labour Practices in the Footwear, Leather, Textiles and Clothing Industries*. Report for discussion at the Tripartite Meeting on Labour Practices in the Footwear, Leather, Textiles and Clothing Industries. Geneva: International Labour Office.

Infocamere-Movimprese, Statistics on Italian enterprises. Accessed January 2004, http://www.infocamere.it/movi_search.htm.

ISTAT, Census of Industry and Commerce, 1980, 1996, Rome.

Jackson, I. (2000). 'Profile of the UK ceramics industry', in I. Jackson, S. Leech, M. O'Keefe and L.Trustrum, *Ceramic Ambitions and Strategic Directions: Perspectives on the UK Ceramics Industry*, Stoke-on-Trent: Staffordshire University Business School, pp. 8–13.

Kathuria, S., Martin, W. and Bhardwaj, A. (2001), *Implications for South Asian Countries of Abolishing the Multifibre Arrangement*, Washington, DC: World Bank.

Keynote (2003), *China and Earthenware Market Report*, London: Keynote Market Reports.

Long, N.E. (1990), 'Conceptual notes on the public interest for public administration and policy analysts', *Administration and Society*, **22** (2), 170–81.

Morosini, P. (2003), 'Industrial clusters, knowledge integration and performance', *World Development*, **32** (2), 305–26.

North Staffordshire Taskforce (2003), *Report of the North Staffordshire Taskforce* http://www.advantagewm.co.uk/task-force-report.doc (Advantage West Midlands: Birmingham).

Padley, H. and Pugh, G. (2000), 'The pottery industry: exploding the myths and charting the way', in I. Jackson, S. Leech, M. O'Keefe and L. Trustrum (eds), *Ceramic Ambitions and Strategic Directions: Perspectives on the UK Ceramics Industry*, Stoke-on-Trent: Staffordshire University Business School, pp. 14–33.

Piore, M. and Sabel, C. (1984), *The Second Industrial Divide: Possibilities for Prosperity*, New York: Basic Books.

Regione Toscana (2003), 'Tessile, prove tecniche per riciclare le acque di lavorazione', *Prima Pagina*, Newsletter of Regione Toscana, 29 November. Accessed 4 January 2004, www.regione.toscana.it/primapagina.

Rowley, C. (1998), 'Manufacturing mobility? Internationalisation, change and continuity', *Journal of General Management*, **23** (3), 21–34.

Sacchetti, S. and Sugden, R. (2003), 'The governance of networks and economic power: the nature and impact of subcontracting relationships', *Journal of Economic Surveys*, **17** (5), 669–91.

Stengg, Werner (2001), 'The textile and clothing industry in the EU. A survey', European Community Enterprise Papers, No. 2, Brussels, European Community.

*Staffordshire Evening Sentinel* (4 June 2003), 'Massacre at Wedgwood', Etruria, Stoke-on-Trent: Staffordshire Newspapers Ltd.

*Staffordshire Evening Sentinel* (26 March 2004), 'The end: Royal Doulton closes its last factory in city', Etruria, Stoke-on-Trent: Staffordshire Newspapers Ltd.

Thomas, J. (1971), *The Rise of the Staffordshire Potteries*, Bath: Adams and Dart.

Unione Industriale Pratese (UIP) (2003), *La congiuntura nel distretto tessile di Prato*, 23 September, Ufficio Studi, published research report, Prato.

Unione Industriale Pratese (UIP), accessed January 2004. http://www.ui.prato.it/unionedigitale/info/distrettopratese.

Whipp, R. (1990), *Patterns of Labour. Work and Social Change in the Pottery Industry*, London and New York: Routledge.

Zeitlin, M. (1974), 'Corporate ownership and control: the large corporations and the capitalist class', *American Journal of Sociology*, **79** (5), 1073–119.

# 12. The policy process: clusters versus spatial networks in the Basque Country

**Mari Jose Aranguren, Miren Larrea and Itziar Navarro**

## 1. INTRODUCTION

The relevance of clusters and spatial networks, and their influence on competitiveness, has been gradually accepted at an academic level, and has already been recognised by many policy makers. The need to adjust to global competition, and the examples of prosperous regions whose economies are built on localised groups of firms, have caused local, regional and national governments to turn to policies based on cooperative networks.

However, despite the importance of clusters and networks for competitiveness (see, for example, Pitelis and Pseiridis, Chapter 2 in this volume), real integration of these concepts on policy making has been far from achieved. It is not easy to do so, but in this chapter we analyse policies related to clusters and spatial networks as defined by different institutional levels. After describing the Basque institutional framework and giving some data about the Basque Country, in the second section we present the cluster policy defined by the Basque government, which applies Michael Porter's concept of cluster. In this section we make an initial evaluation of this policy. In the third section, we then argue that the territorial point of view is relevant in several local production systems in the Basque Country, and present the local development agencies' (LDA) model as another network-oriented policy.[1] In the final section we compare both policies and present the main conclusions.

### Basque Institutional Framework

Following the Spanish model of autonomous communities, the Basque Country has had its own government and autonomous parliament since

the arrival of democracy in Spain in the late 1970s. So the Basques virtually govern themselves in sectors such as education, health, culture and housing. Other sectors, including research, industrial policy, transport and communications, also contribute to a high degree of autonomy, financed by an economic agreement struck with the Spanish central government. This agreement permits the Basque authorities to collect almost all of the taxes levied in the community, and then to administrate the revenue collected according to their own budget and that of the Spanish central government. So the Basque Country has its own government, and its own Industry, Commerce and Tourism Ministry with considerable scope for policy making.

Politically speaking, the Basque Country is organised on confederate lines; the three historic territories or provinces, Araba, Bizkaia and Gipuzkoa, each return 25 members to the Basque parliament, which makes the laws, approves the annual general budget, elects its own president, and keeps a close watch on everything the government does.

In addition, each of the historic territories mentioned above has its *juntas generales*, the approximate equivalent of a provincial parliament, with powers regarding fiscal legislation, and the capacity to handle the taxes collected.

The Basque parliament debates and approves laws, and the provincial councils (*diputaciones*) are the executive bodies, the governmental organisations, of the three historic territories. Each of these councils is headed by a chief executive, who is in turn supported by a team of executive councillors. Every one of them is in charge of a department, which takes responsibility for areas such as economy, innovation and knowledge management, social services, and environment and sport, always of course within its own province. The association between these institutions and the Basque government gives the community an unusual, part-federal, part-confederal organisational structure. All taxes are collected by the Basque institutions in their own territory; each provincial treasury collects the revenue generated after having first decided tax levels. Next, the Basque Council for Financing sets out how the amounts available should be distributed. After the quota to the central Spanish government has been paid, top representatives from the provincial councils and the Basque government decide on the distribution between the government and each of the three provinces.

The structure is completed with municipal authorities, which have little tradition and scope for industrial or economic policies, but a growing consciousness of their role in generating an advantageous environment for economic activity. The three provinces have their own idiosyncrasies, and this will also reflect on how spatial networks are developing within them.

**Some Data**

The three historic territories (Araba, Bizkaia and Gipuzkoa) have a population of approximately two million inhabitants. In 2001, the Basque economy generated a GDP of €42 800 million (6 per cent of the Spanish GDP), and employed more than 800 000 persons. As we can see in Table 12.1, as regards the distribution of these variables among the three territories, Bizkaia represents more or less half of the Basque Country, Gipuzkoa 35 per cent, and Araba 15 per cent.

*Table 12.1 Basque Country statistics, 2001*

| Territory | Population (%) | Employment (%) | GDP (%) |
|---|---|---|---|
| Araba | 14 | 16 | 17 |
| Bizkaia | 54 | 50 | 50 |
| Gipuzkoa | 32 | 34 | 33 |

*Source*: Basque Statistic Institute.

If we analyse the importance of each economic sector in the Basque Country, we can say that industry generates 36 per cent of GDP, with an employment rate of 30 per cent. So, compared with other developed economies, a relevant feature of the Basque economy is the high weight of the manufacturing sector.

There have been important improvements in the Basque economy in the last decade. For instance, Eurostat data show that the Basque GDP per capita (in purchasing power parity terms) increased from 89.7 per cent of the EU average at the beginning of the 1990s to 105 per cent in 2002. This implies a convergence process with the EU countries' economies.

## 2. CLUSTER POLICY IN THE BASQUE COUNTRY

In response to the increasing relevance of clusters for competitiveness, at the beginning of the 1990s the Basque Country, Scotland and Catalonia were pioneers in Europe in the establishment of a cluster-based policy (see Brown 2000). It is now a decade since different agents took the first steps to establish cluster associations and design cluster policy in the Basque Country; this section presents a description and then a first assessment of the Basque cluster policy.

## 2.1 Genesis of the Cluster Policy

At the end of the 1980s/beginning of the 1990s, the Basque Country experienced a decline, resulting from losing its traditional competitive advantages in international markets. Until then most of the industries in the Basque Country were competing on price. However, it was necessary to develop new, specialised and sustainable advantages to compete in international markets and to face new challenges, such as the common European market in 1993.

Trying to respond to this situation, the Basque government, the Provincial Council of Bizkaia and Sociedad Promotora Bilbao Plaza Financiera asked a firm called Monitor Company to study the future competitive situation of Basque industry in the world economy. This study based the potential competitiveness search on Porter's newly presented work on *The Competitive Advantage of Nations* (Porter, 1990).

First, Monitor Company followed a statistical process to select a preliminary list of approximately 50 industries capable of being internationally competitive. Second, it then analysed each of these 50 industries to evaluate their potential for international competitiveness. The criteria followed in that evaluation were the nature and scope of the competitive advantage (regarding the main international competitors and the possibility of improving such competitiveness with their own resources, in the short term and at reasonable cost), presence or absence of an environment leading to sustained competitiveness, importance for the Basque economy (contribution to GDP and strategic position), employees in these firms and industries, level of productivity per employee, level and type of foreign property, and vertical and horizontal links. Third, these industries were grouped to define clusters, which provoked consideration of the possibility of improving their competitiveness.

## 2.2 Basque Cluster Policy Phases

Taking into account Monitor's study, and trying to encourage clusters, in 1991 the Basque government established a competitiveness programme that supported workgroups in nine priority clusters. The workgroups were constituted by business personalities, government representatives, industrial association leaders, and other institutions (education, formation, basic and applied investigation), and they worked to define priority improvement areas and action proposals in the nine priority clusters (Basque Government, 1994). Only three of these clusters had been selected by Monitor: home appliances, machine-tools, and value-added steel. The shipment and manipulation cluster was reoriented as a cluster connected to the port of

Bilbao, and there were five new clusters: aeronautics, paper, automotive components, tourism and foods. Indeed, in some cases, the action proposal of the workgroup was to formally constitute the cluster.

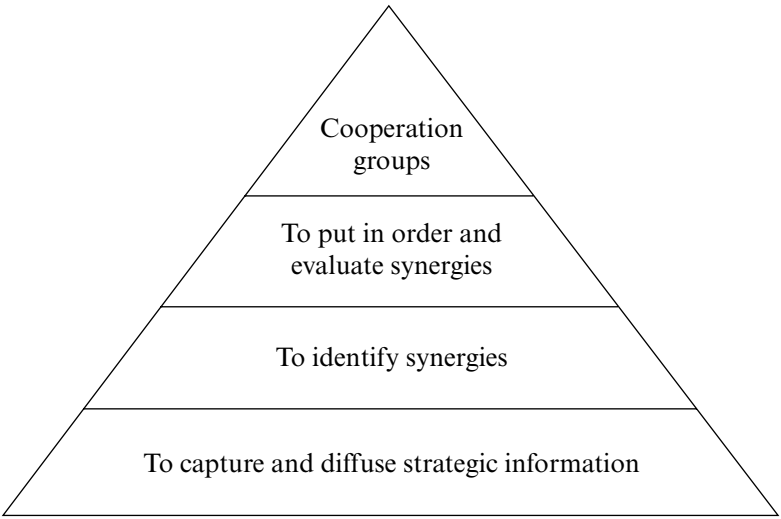
As a result of this dynamic process of interrelationships among different agents, EZTEN (Capital Risk Society) and the Basque Quality Improvement Foundation (Euskalit) were created, the Basque Technology Plan, the RETO programme (for enterprise management) and the Strategic Alliances Programme were launched, and an inter-cluster committee was created. This committee detected the need to create a competitiveness centre. This centre, with a very short administrative structure, was designed to work in dynamising the actions of the competitiveness programme, and to be a bridge between public and private institutions.

The Basque government wanted cluster associations to be an industrial policy instrument, and thanks to the 1995–99 industrial policy, during 1997, the Industry, Agriculture and Fishing Department signed collaborative agreements with seven cluster associations: machine-tools, automotive components, home appliances, Bilbao port, environment, telecommunications and management knowledge. These agreements were signed for three years and made it possible for selected actions to be financed by the government and by cluster members, for example, innovation projects and international market access and quality improvement projects, if these were pursued in cooperation. In 1999 agreements were also signed with the energy, paper and aeronautic cluster associations, and in 2000 with the maritime industry association.

In 2000, a reflection process on the cluster policy was initiated by the Industry, Commerce and Tourism Department. As a result of that process the department decided to continue with the cluster policy, which was included in the Quality and Innovation Management Direction. The cluster policy mission is stated as 'the improvement of competitiveness responding to strategic challenges through cooperation.' In order to reach this mission this policy proposes certain strategic actions, which are illustrated in Figure 12.1. Indeed, since 2000, the Basque government has had a stronger relationship with cluster associations, which are obliged to present strategic plans for three to four years and annual action plans.

## 2.3 Some Features of the 11 Basque Cluster Associations

There are 11 cluster associations in the Basque Country: aeronautics (HEGAN), Bilbao port, automotive components (ACICAE), home appliances (ACEDE), energy, machine-tools (AFM), environment (ACLIMA), paper, telecommunications (GAIA), maritime and management knowledge. All of them were created or included in the Basque government




*Source*: Elaborated from information facilitated by Quality Management and Innovation Direction.

*Figure 12.1 Strategic actions of clusters*

competitiveness programme during the 1990s. Where industry associations existed, the creation process of the cluster association was shorter (machine tools, telecommunications, home appliances) and happened at the beginning of the 1990s. However, in other cases the process was more difficult (paper), or the idea of creation appeared later (energy, environment, knowledge), and so the associations were constituted in the late 1990s.

Most of the Basque cluster associations are based on the production value chain. Their members are mainly firms, although they also have some formation centres, technology centres and public institutions. To belong to the association, members have to pay a fee and be in the industry that the association represents.

The size of the clusters is very variable and can be analysed using different indicators: number of members, members' employment, members' sales and so on. If we use the number of employees or the sales, sometimes it is difficult to estimate the size of each cluster, because some members have employees and sales outside the Basque Country. If we consider the number of firms associated in the cluster, then the four biggest are automotive components, management knowledge, telecommunications and the port of Bilbao, and the smallest are home appliances, paper and aeronautics. But, in some clusters the average size of the firms is larger, so, if we take

into account the number of employees in the cluster, for instance, the home appliance association will be the second or third. Either way, if we compare the Basque associations' size with European clusters analysed by Isaksen and Hauge (2002) and the Harvard database (Navarro, 2003), we can conclude that the Basque associations are smaller than cluster associations from other countries.

Although there are differences from one cluster association to another, we can say that all Basque clusters have in general a very short administrative structure, because their philosophy is that the main actors in the clusters are its members (firms, universities, technology centres, etc.) and that their function is to be a meeting forum for the cluster members. In this sense, they do not have an interest in increasing their structure. All of them have a director whose team is basically in charge of the clusters' management, and they try to subcontract all the activities that they are able to externalise.

As the mission of the cluster policy is to increase the competitiveness of the Basque economy by means of cooperation, the mission of each cluster association is in general to increase the competitiveness of cluster firms and of the industry in which the cluster acts. To achieve this target, all cluster associations work in three main areas, trying to improve the cooperation of the enterprises in the cluster in these areas. These three common areas are: technology, quality and internationalisation.[2] Each cluster has its goals in each of these three areas, and some of them additionally act in other areas.

Regarding the relation with their members, each cluster association has its general assembly, in which all members participate, and a management board constituted by members designated by the general assembly and some members of Basque Government. In addition, each cluster has specific committees (depending on the cluster there are two, three or four committees), generally related to the three main areas already mentioned: technology, quality and internationalisation. Each committee is responsible for developing objectives relating to that area, as defined by the management board, and the committees are constituted by enterprise members related to the specific area of the committee.

There is no established formal system for relationships between different cluster associations. They have an informal relationship, though they consider that a stronger relationship would be interesting. However, they have a close relationship with the Basque government Industry, Commerce and Tourism Department. The Basque government designates horizontal and vertical technicians to be present at the meetings of the cluster associations. Vertical technicians have the general vision of each cluster association, and horizontal technicians the general vision of each strategic area. In this way, there is at least one technician who has the general vision of each cluster

and of each strategic area. Having this general vision of all the clusters and knowing the goals of the Basque industrial policy, it is possible to give guidance on critical questions related to the clusters. Also, the government knows directly the main problems, activities and relations of each cluster and each area, which is very helpful in designing industry policy and potentially efficient in evaluating the competitiveness programme.

Clusters are financed by public and private funds. Members of the cluster have to pay an annual fee, which varies with the size of the firm.[3] This fee finances 40 per cent of the internal costs and 50 per cent of the external costs (subcontracted market studies etc.). The rest is financed by the cluster policy of the Basque government, which provides 60 per cent of internal costs and 50 per cent of external costs, to a maximum of €240 000 for each cluster association. In addition, projects can be financed by means of other Basque government policies related to internationalisation, technology, quality and so on. The percentage financed by the Basque government depends on the kind of project.

## 2.4 Policy Principles and Guidance: a First Evaluation of Basque Cluster Policy

Given the profusion of cluster policies, interest is increasing in the factors that make them successful. In this sense, different organisations have studied best practice in cluster policy: the Euro-Cluster project (see Euro-Cluster: Final Report, 2000), based on case studies in seven European regions, and carried out by European Policy Research Centre and Strathclyde University; Regional Clusters in Europe, coordinated by Isaksen and Hauge (2002) and financed by the European Commission; and studies such as *Boosting Innovation: The Cluster Approach* (1999) and *Innovative Clusters. Drivers of National Innovation Systems* (2001) undertaken by the OECD.

From these studies, and from Enright and Ffowcs-Williams (2000), Raines (2000, 2001), Taylor and Raines (2001), Roelandt and Hertog (1999) and Lagendijk (1999), we have extracted the features that a successful cluster policy should have. We have organised these principles according to the different phases of the cluster policy: identification and selection of clusters, policy design, implementation and evaluation. We have then made a first evaluation of the Basque cluster policy in each of these phases.

### Identification and selection of clusters

*Principle 1: Clusters should not be created from nothing or where there are not some initial conditions. This suggests an indirect role for government.*

*Principle 2: Analysis to identify clusters must combine quantitative indicator analyses and qualitative methods based on expert opinion with knowledge of local economic strengths.*

*Principle 3: If cluster selection is necessary, the existence of an organised agent group is a priority. To have a cluster portfolio in order to reduce risk is also very important.*

In the Basque Country case, the Monitor Company study proposed some priority clusters. According to the opinions of regional institutions and firms, the initially identified clusters did not reflect Basque economic strengths because of the criteria used in their identification. So, this study was completed with a dialogue for a better adjustment of the identified potential clusters to regional priorities and perceptions. Given that the quantitative analysis was completed with qualitative analysis, we consider that Basque cluster policy is based on existent or emerging clusters.

Initially, the selection of priority clusters was top–down. However, immediately after their identification the Basque government asked for active participation of the cluster agents. In some identified and selected clusters there was already a core of organised actors, because there had been some partnerships in the industry; for example, machine-tools, telecommunications and home appliances. This transfer of responsibility from the Basque government to the private sector was very important. In those cases in which potential participants did not assume such responsibility, the cluster was not formally constituted. In clusters that were constituted later there was no selection process, and their constitution was proposed bottom–up.

Considering the rapidly changing context, in our opinion an important challenge of the Basque cluster policy regarding this identification and selection process is adaptation to the new economic structure. To be open to proposals of new clusters that can come from the private sector is not enough. We think that the Basque government should continue to be proactive as it was in the beginning. In this regard it would be very interesting to make a study to detect new clusters or changes in the relations between existing ones.

## Cluster policy design

*Principle 4: Cluster policy should, above all, stimulate cooperation and enterprise networks, and facilitate more adapted services to cluster agents. Thus the private sector should assume the leadership in cluster development.*

*Principle 5: In order to create groups for cooperation, it is very important to convince members of the fact that projects in cooperation would increase their competitiveness. In this sense, it is very important to adopt initially a low-risk and early-return focus.*

The clusters policy mission is the improvement of competitiveness responding to strategic challenges in cooperation. In order to meet these challenges through cooperation, the policies start from basic actions (see Figure 12.1). Accordingly, each cluster association has the mission of improving its competitiveness through cooperation. However, in the cluster associations' directors' opinion this mission is very difficult to achieve, because the creation of cooperation groups asks for high confidence between its members, and confidence generation takes a long time.[4] Because of this, in the Basque cluster policy, projects that help create confidence between the members are also evaluated.

Initially the Basque government assumed the cluster policy leadership, but almost from the beginning working groups were created in each cluster. Representatives of firms, training and technology centres and the Basque government participated in these groups, and each group defined a general strategic plan which was discussed with the Basque government, materialising in an agreement between the cluster association and the Basque government. As a consequence, the administrative structure of each cluster is very short, because the private sector has the leadership in cooperative projects.

Regarding early returns, although it is not mentioned in the cluster policy, in practice this policy has facilitated more adapted services to each cluster. In more than one of the cluster associations there are training and technology centres adapted to the cluster's needs. Besides, coordination between the Basque government and the cluster associations facilitates internationalisation, technology development, and the adaptation of government policies to each cluster's needs.

Some cluster associations are making efforts to invite experts or present cases similar to projects that they want to broach in order to convince their members of the advantages of cooperative behaviour. Either way, in our opinion there could be improvement in this aspect. In particular, institutions specialised in analysis and research (such as universities etc.) should be involved in this task.

## Cluster policy implementation

*Principle 6: Valid cluster policies are not homogeneous. Cluster policies and programmes must be adapted to the context where they are applied, taking into account the local, economic and social reality of each cluster.*

*Principle 7: A global cluster policy has to include community-building measures, measures to create relationships and projects, measures to create common resources, and measures to attack system failures.*

*Principle 8: It is convenient to match cluster policy in already existent structures and to give an opportunity for a major integration of different policy areas. It is convenient to have a supervisor entity for this integration.*

The Basque cluster policy has been adapted to the context from the beginning, when Monitor Company's proposal was contrasted with different working groups before the cluster definition. Besides, the Basque government signs annual agreements with each cluster association, which offers an opportunity to address each association's reality, as annual aims and action plans are adapted to the context. There is also some flexibility in the areas in which clusters work. Although the cluster policy has three main challenges to which to respond (internationalisation, technology and quality), each cluster can widen these strategic areas.

As examples of measures to create community, we can mention meetings and forums that cluster associations organise for their members. In these meetings, common problems and opportunities can be identified and joint solutions found, creating a strong sense of membership of the cluster. Besides, all cluster associations have their web page, and many of them have reviews where the clusters' main activities are included. More specific and in-depth studies made to attend to members' needs are also quite common. All these activities generate a strong sense of identity. However, we have detected that the Basque cluster associations are not very well known in the Basque Country and abroad, which raises difficulties in increasing the number of members.

Although in some cases joint projects have been born in different cluster meetings or forums, there are specific measures to create joint projects, such as cluster associations' proposals to their members regarding attractive joint projects. Cluster associations also generate some common resources for their members, such as access to strategic information, specific infrastructures, technology transfer, adapted training courses and so on.

The way in which the Basque government's relationship with the cluster associations is organised facilitates some policy integration. Quality, technology and internationalisation policies are quite integrated because government technicians responsible for these areas are also horizontal technicians in the cluster policy. These technicians are part of the same department, which makes their coordination easier. It would be fruitful to have this coordination with other areas such as training.

Regarding the system to establish cluster policy, when an association existed, it was this association that took the lead. If there were no associations, then very short structures were created, because the philosophy is that the main actors of the cluster are their members. This implies that the cluster association manager function is to promote the cooperation of the members.

**Cluster policy evaluation**

*Principle 9: Cluster policies must be evaluated, despite difficulties.*

In the Basque cluster policy, the system itself supposes self-evaluation, because the high participation of cluster members in its activities is evidence of its value. However, although there is an evaluation of the particular activities organised in each cluster, and the Basque government controls each cluster association's annual expenses, there is no global evaluation of each cluster's activities and their impact on competitiveness. We think that this is still an unresolved issue.

It is difficult to make a general evaluation of the cluster policy, at least if we want to quantify its results. However, we can say that its results exceed the effort (in costs) required. With an investment of €2 million, mechanisms for dialogue and cooperation between different Basque agents in strategic areas are generated. Although it is difficult to quantify its impact on Basque competitiveness, its effect in increasing cooperation behaviour is positive. We also think that it helps adapt public policy to the firms and other agents' needs.[5]

# 3. A MARSHALLIAN OUTLOOK OF THE BASQUE DEVELOPMENT AGENCIES MODEL[6]

## 3.1 From Marshall's External Economies to the Territorial Concept of Becattini

Marshall (1963) defined the concept of external economy. At the end of the nineteenth century he observed the guilds in England, and studied the advantages they had in being concentrated in a small geographical area. He analysed how, when a production process has a considerable volume, a series of advantages is generated for participating in it, such as transmission of knowledge, readiness to adopt new inventions and improvements, the existence of subsidiary activities, the use of expensive machinery and a

constant supply of specialised labour. These advantages were catalogued as external economies by the author.

In the 1970s, Becattini took up Marshall´s ideas to explain the positive evolution of certain Italian areas, later called the Third Italy, during the then current economic crisis. The concept of industrial district has since developed. It goes beyond the geographical proximity and specialisation present in Marshall, and includes aspects such as the prevalence of small firms, tight collaboration among them, competition through innovation and realistic salaries, confidence between employers and qualified employees, collective services, and a regional and municipal public administration that reinforces the innovation capacity of local industry; see also the chapters by Bellandi, Parrilli, Pitelis and Pseiridis, and Henry and Pinch, among others, in this volume (Chapters 4, 10, 2 and 5 respectively).

These characteristics of specialisation of a territory in a productive process and collaborative networks between small firms make the theory of industrial districts adequate to explain the concept of cluster. If one characteristic of this approximation to clusters should be distinguished among others, however, it would be the relevance that the Italian school gives to territory. This can be seen when Becattini (1979) says that territory is not just a framework for economic activity, but an economic resource. Thus the quality of territory makes it possible for a technology to mix with a specific culture; for firms to find a specific environment; for the market to translate competition into cooperation; and for the economy to mobilise a society and the intentions of each of its members. Consequently, economic thought that lacks this view loses the link that makes these connections possible.

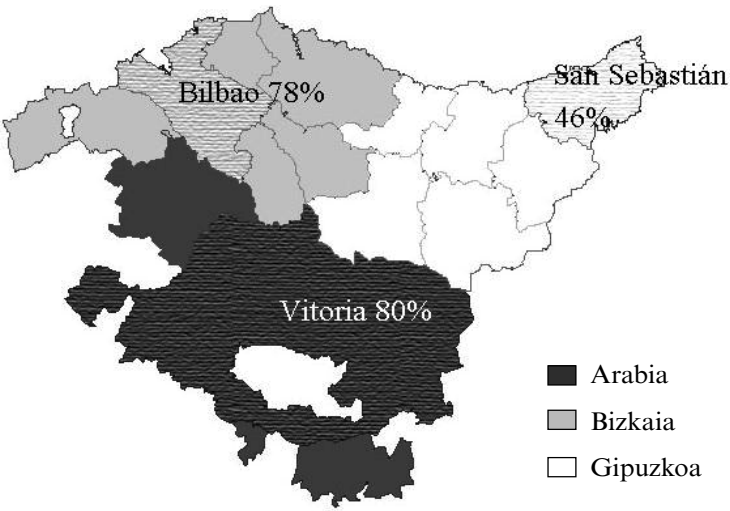
## 3.2 A Territorial Approach to the Basque Country

In the next paragraphs we develop the hypothesis that the Italian approximation to territory can help explain some of the aspects of the creation and actual characteristics of local development agencies (LDAs) in the Basque Country.

The first step in incorporating the territorial variable into economic analysis is to determine a significant territorial unit for such analysis. Following Becattini and Rullani (1996), the analysis of competitive advantages has considered a variety of production contexts, but only partially; differences between national and firm systems have been referred to, ignoring differences between local systems. Following these authors, the empirical studies based on the analysis of local production systems must take as an object of study the whole production process. In this the activities oriented to the production of goods are considered as well as a set of activities that, consciously or unconsciously, reproduce human and material factors of

production. Thus an empirical analysis requires delimiting a territorially defined socio-economic subsystem. Among the territorial units officially delimited in the Basque Country, those that best fit these characteristics are the functional areas defined by the Basque government for territorial arrangement. That is why this part of the chapter refers to these units, though as we develop our arguments we will introduce another unit, that delimited by the influence area of local development associations (LDAs). Usually a functional area includes various of these agencies.

Having presented the analysis units as a first step in studying different production system types within them, there is another element that must be introduced: the polarising influence of capital cities' functional areas on the rest of the areas of their provinces. This can be seen in Figure 12.2.




*Note*: Shading denotes the three provinces of the Basque Country.

*Figure 12.2 Concentration of population of a province in the capital cities' functional area*

If we analysed employment instead of population, Bilbao would keep its polarising influence, Vitoria would strengthen it up to 85 per cent, and San Sebastian up to 56 per cent.

Figure 12.2 shows two different models of distribution of population and economic activity. On the one hand there is a strong polarising influence of the functional areas of Bilbao and Vitoria in their provinces. On the other hand, San Sebastian does not have such a polarising influence within the province of Gipuzkoa, which presents a much more balanced spatial distribution.

According to the policy promoted by the Provincial Council of Gipuzkoa (Diputación Foral de Gipuzkoa, 2003) in the project called Gipuzkoa 2020, this balanced distribution is desirable, but goes against the inertia of actual territorial distribution. This can be seen in their definition of four possible scenarios, developed as a working hypothesis and classified from least to most desirable as follows. The first scenario would be a 'shrunken Gipuzkoa', in which the capital city area has uncontrolled development, with the central area of the province losing importance. In the second scenario, a 'Gipuzkoa on tow', this concentration process is present, but in a bigger area along the coast of the province. The third scenario, a 'paradoxical Gipuzkoa', shows two polarising foci; the first has already been presented, the capital city area. The second one is the Mondragon area, which is well known worldwide for the importance of cooperative industrial firms. The fourth scenario, considered as most desirable, shows another two new focal areas and presents a rather balanced distribution of activity and population in the territory of Gipuzkoa.

Seeking this fourth scenario means fighting against inertia, and requires structuring territory at various levels. Infrastructure is no doubt important and is usually considered and developed. But firms' actual needs require structuring territory at other levels, such as human capital development, innovation and knowledge. It is in this context that the cluster concept and the capacity of LDAs to stir local agents into action can have a crucial role.[7]

### 3.3 Territory in the Basque Country from a Marshallian Point of View

The next step to understand the LDAs from a territorial point of view is based on the results obtained in Larrea (2000), where a typology of functional areas of the Basque Country was defined following their proximity to a Marshallian model. The unit of analysis was the functional areas of the Basque Country, and for each of these productive specialisation and inter-firm relationships in terms of input–output linkages were measured.

The results obtained are represented in Figure 12.3. There were four functional areas that met the criteria established to consider them as Marshallian: Eibar, Durango, Beasain–Zumarraga and Laguardia. There were two other areas that, analysed as a whole, did not fit this category, but that had subsystems which could be catalogued as Marshallian. This was the case of Zarautz–Azpeitia, with the wooden furniture production subsystem, and Tolosa, with the paper production subsystem. Finally, the functional area of Mondragon presented special characteristics that required definition as a specific category: the specialisation level was considerable, but input–output relationships between firms were not as significant as in the other

areas previously mentioned. However, clear advantages detected in respect of technology transfer and education and training made it necessary to reflect an area with strong external economies.

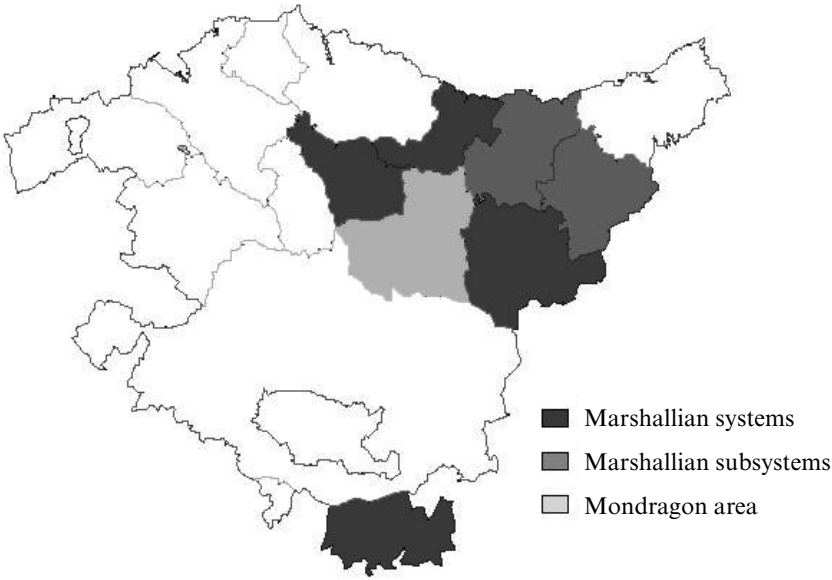



*Figure 12.3 Functional areas with Marshallian systems or subsystems*

If the two maps presented are superposed – the one showing the polarisation around the capital city areas and the second one with the Marshallian systems or subsystems – a conclusion can be obtained: the weaker the polarising effect of the capital cities, the stronger Marshallian models have emerged. No cause–effect relationship can be established, but these data can help understand interrelations between economy and territory in the Basque Country, and the creation and actual model of the local development agencies.

### 3.4 Genesis and Models of Local Development Agencies

LDAs started to be created in the Basque Country at the end of the 1980s, as a response by local authorities to high levels of unemployment. They were, in a sense, intermediaries between firms and the labour force in their areas of influence. The territorial perspective was strong from the beginning, as they were created in areas where a productive process and a social group with strong interdependencies coexisted.

While in recent years development agencies have been created all around the Basque Country, in the beginning they were founded in two kinds of areas. On the one hand, they were created in areas of Gipuzkoa with a Marshallian system or subsystem, as a working tool for various municipalities to manage a territorial unit beyond individual municipalities. On the other hand, agencies were created in the capital cities and some other big cities in Bizkaia. In this case they were created as a promotion department of a single municipality. So two models of agencies could be defined following their genesis: the supra-municipal model, created in Gipuzkoa, and the municipal model, applied in the capital cities and some other big cities.

The characteristics of the two kinds of agencies and their geographical areas of influence are different. The supra-municipal agencies work on territories with a strong industrial specialisation and a moderate influence from the capital city area, and emerge where the Marshallian models described previously are very frequent. They have developed a wider set of activities, with initially less of their own funds and more dependence on external funds (the EU, the Basque government, firms in the territory, foundations, etc.). The municipal agencies developed in the capital cities and other relatively big cities are basically specialised in the service sector, and have economies of agglomeration and urbanisation that do not respond to the Marshallian model presented. That is why we consider that the approach taken in this chapter to the development agencies applies more to the supra-municipal agencies than to the municipal ones, which should be studied using other methodologies.

Regarding institutional fit, the first agencies were created bottom–up at the end of the 1980s and beginning of the 1990s, as they were a project of the local authorities, though some of them received some funds of the Provincial Council of Gipuzkoa, especially to formulate their strategic plans. Later on, the Provincial Council of Bizkaia, together with a well-known financial entity in that territory, developed a programme to create what have been called Behargintzas. Though these institutions are not directly comparable to the agencies, they assume the employment-oriented vision the agencies had in the beginning and there is a case, that is, the Behargintza in the area of Durango, where this entity assumes additional functions and has integrated into the association of development agencies of the Basque Country. It is interesting to note that this was the only functional area in Bizkaia that followed a Marshallian model.

So it can be said that there was an initial bottom–up model that has been reinforced by a top–down initiative in Bizkaia, where the agencies model is developing more slowly. However, taking into account that these Behargintzas still present very strong specificity, they have not been

considered as LDAs when defining the model of development agencies in the Basque Country.

To understand the LDA model, it is necessary to mention Garapen, the Basque Association of Development Agencies. There are 17 agencies, 15 of which are associated. These 15 cover 76 per cent of the population in Araba, 73 per cent of Gipuzkoa and 51 per cent of Bizkaia. Garapen was created in 1993 when the agencies saw that although each of them was autonomous and developed their activity in geographically differentiated territories, there was a need to cooperate and coordinate some of their actions. This network could also facilitate the integration of the agencies in other national and international networks. Thus Garapen is more a meeting point for agencies than an additional structure that assumes specific services delegated by agencies.

There is a final characteristic of the agencies that should be mentioned. The LDAs included in Garapen are oriented to service provision. This is reflected in Garapen (2003), where it is said that the activity of the agencies is set on three main axes: employment services, entrepreneur support services and services to firms. There are additionally other services, such as tourism promotion, urban regeneration and commerce promotion. The employment services include orientation, intermediation and training. The entrepreneur support services include awareness programmes, advice and support for feasibility plans, 'incubation' centres, and access to finance. Finally, services for firms include diagnosis, information, life-long training, intermediation, support to management, promotion of industrial land, and other infrastructure.

One of the big challenges that LDAs face nowadays is to consolidate certain activities that are already being developed to reinforce their role as a central element in their territories that stirs the rest of the local agents into cooperative action. If this role were consolidated, it would be possible to study this phenomenon in cluster terms.

## 4. CONCLUSIONS

The aim of this chapter was to illustrate two different policies that are at present being developed in the Basque Country and that are related to clusters and cooperative networks.

In the case of the cluster policy of the Basque government, first we described Basque cluster associations and the cluster policy. Second, after a decade since different agents took the first steps to establish cluster policy, we have made a first assessment of it, concluding that it has succeeded in

generating cooperation opportunities among different Basque agents in strategic areas.

In the case of the local development agencies, we have tried to explain their origins and actual models based on Marshall's concept of external economies and Becattini's territorial perspective. This presents a challenge that LDAs face that would make it possible to study this model in cluster terms – that of the consolidation of different activities to reinforce their role in stimulating territorial-based cooperative action.

The two models interact in the same territory, and we think that both points of view are compatible as long as coordination between them is sought when clustered firms also have a significant local concentration. Positive experiences in the coordination of a cluster and a local development agency have been observed in at least one functional area. Additionally, as both policies share a cooperative network model, there could be synergies, and best practices could be transferred.

To close this chapter, Table 12.2 compares both policies, aiming to reflect the specificities of each model. First of all it must be said that both policies are contemporaneous. The first agency was created in 1985 and the model extended especially in Gipuzkoa during the last years of the 1980s and first years of the 1990s. The cluster policy of the Basque government began in 1990.

*Table 12.2 Main similarities and differences between policies*

| Cluster policy | Local development agencies |
|---|---|
| • Begins in 1990<br>• Based on Michael Porter's view of clusters<br>• Started as top–down policy<br>• Supported by the Basque government<br>• No territorial view<br>• Main challenge: reinforce cooperation in more strategic projects and define an evaluation system | • First agency created in 1985<br>• Based on a local endogenous development point of view<br>• Mostly bottom–up (except Behargintzas in Bizkaia)<br>• Supported by municipal authorities and in some cases by provincial councils<br>• Territorial view<br>• Main challenge: reinforce their role as an agency that stirs other local agents into cooperative action in a territory |

As has been discussed in previous sections, the conceptual model that can help explain each of these policies is different. The concept of cluster on

which the Basque government's policy is based is that defined by Porter. On the other hand, though Marshall's or Becattini's ideas were not specifically in mind when creating the local development agencies, we think that this is an adequate conceptual framework in which to study them. Adapting these ideas to the agencies' language, we could talk about an endogenous development framework.

One of the critical differences between the policies is that the cluster policy was at least initially a top–down policy, while the agencies have been created bottom–up. The Basque government first decided to implement this policy and then contacted different economic agents to make it possible. However, not every work group promoted by this government ended up creating a cluster, as there were agents that did not assume the necessary leadership. Nowadays there is a centralised structure that coordinates the relationship with different cluster associations through an annual agreement.

The LDAs were an initiative of municipal authorities that, thanks to cooperation among them, made it possible to create supra-municipal areas for development-oriented action. Additionally, many of the agencies of the Basque Country are part of the Garapen network,which is a cooperation nexus where each agency takes part voluntarily without financially depending on it, as opposed to the centralised structure defined for the cluster policy. An exception to this rule would be the case of the Behargintzas, created by the Provincial Council of Bizkaia top–down. But as previously mentioned, these entities have not been catalogued as LDAs in the chapter due to their specificities, which make it difficult to include them in the same models as the agencies.

Consequently, the institutions supporting each of these policies are different. The cluster policy is supported by the Basque government, while the agencies are supported by municipal authorities, and the Behargintzas in Bizkaia by the Provincial Council.

Regarding the territorial view of these policies, it can be said that the cluster policy of the Basque government does not respond to a territorial view (understanding the territory as Becattini does as we have previously mentioned). The Basque government applies this policy to firms located in the area where this government is competent. Such an area is an administrative division that does not necessarily respond to economic criteria. To create the supra-municipal agencies, on the other hand, there is a process to determine which are the municipalities that, on an economic and social logic, should be part of each of these supra-municipal levels. So, even though politics might sporadically affect these configurations, we can say that the area where the agencies work responds to the territory where the main interactions that must be managed occur.

Finally, we have included in Table 12.2 the main challenges we think these policies have for the future and that should be assumed by politicians as well as researchers in the Basque Country.

# NOTES

1. See also Chapter 7 of this volume, in which Gilly and Perrat analyse territorial aspects of governance relationships.
2. In the management knowledge cluster the main areas differ.
3. For instance the lowest fee is €300 annually (in the energy cluster), and the highest is €3500 annually.
4. For a detailed discussion of the processes involved in developing different types of trust and confidence, see Dupuy and Torre in Chapter 8 of this volume.
5. More detailed analysis of the cluster policy in the Basque Country can be found in Aranguren and Navarro (2003).
6. More detailed analysis of the Basque Development Agencies Model can be found in Larrea (2003).
7. See, for example, the discussion of the role of public goods in the chapter by Bellandi in this volume (Chapter 4), following from the identification of a related bifurcated scenario in the city of Florence.

# REFERENCES

Aranguren, M.J. and Navarro, I. (2003), 'La política de cluster en la CAPV: una primera valoración', *Ekonomiaz*, **53**, 90–113.

Basque Government (1994), *Una Visión Para el Futuro*, Vitoria.

Becattini, G. (1979), 'Dal settore Industriale al distreto industriale. Alcune considerazioni sull'unitá di indagine dell'economia industriale', *Rivista di Economia e Politica Industriale*, **V** (1), 7–14.

Becattini, G. and Rullani, E. (1996), 'Sistemas Productivos Locales y Mercado Global', *Información Comercial Española*, no. 754.

Boekholt, P. and Thuriaux, B. (1999), 'Public policies to facilitate clusters: background, rationale and policy practices in international perspective', in OECD, *Boosting Innovation: The Cluster Approach*, Paris: OECD .

Brown, R. (2000), 'Cluster dynamics in theory and practice with application to Scotland', Regional and Industrial Policy Research paper, no. 38, European Policies Research Centre, University of Strathclyde, Glasgow.

Diputación Foral de Gipuzkoa (2003), 'Proceso de Reflexión Estratégica Gipuzkoa 2020. Dossier de actividades 2002', San Sebastián: Diputación Foral de Gipuzkoa.

Enright, M. and Ffowcs-Williams, I. (2000), 'Local partnership, clusters and SME globalisation', prepared in conjunction with and under the guidance of the Local Economic and Employment Development Programme (LEED) of the OECD Territorial Development Service. Workshop paper.

Euro-Cluster: Final Report (2000). European Policies Research Centre. University of Strathclyde, Glasgow.

Garapen (2003), Garapen 10: Asociación Vasca de Agencias de Desarrollo. Documento editado para la celebración del 10º aniversario de Garapen, Bilbao.

Isaksen, A. and Hauge, E. (2002), *Regional Clusters in Europe*, Observatory of European SMEs 2002, no. 3. Luxembourg: Office for Official Publications of the European Communities.
Lagendijk, A. (1999), *Good Practices in Cluster Development Initiatives: A Summary of an ADAPT Funded Analysis of Cluster Initiatives, CIURDS*, University of Newcastle upon Tyne.
Larrea, M. (2000), 'Sistemas Productivos Locales en la C.A. del País Vasco', Gobierno Vasco, Vitoria-Gasteiz.
Larrea, M. (2003), 'Clusters y territorio: retos del desarrollo local en la CAPV', *Ekonomiaz*, **53**, 138–59.
Marshall, A. (1963), *Principios de Economía*, Madrid: Aguilar.
Monitor Company (1991), 'La ventaja competitive de Euskadi. Fase I: Identificación del potencial de competitividad', *Ekonomiaz*, **21**, 156–209.
Navarro, I. (2003), *'Análisis y política de clusters: teoria y realidad'*, *Ekonomiaz*, **53**, 14–49.
OECD (1999), *Boosting Innovation: The Cluster Approach*, Paris: OECD.
OECD (2001), *Innovative Clusters: Drivers of National Innovation Systems*, Paris: OECD.
Porter, M. (1990), *The Competitive Advantage of Nations*, New York: Free Press.
Raines, P. (2000), 'Developing cluster policies in seven European regions', Regional and Industrial Policy Research paper, no. 42, European Policies Research Centre, University of Strathclyde, Glasgow.
Raines, P. (2001), 'The cluster approach and the dynamics of regional policy-making', Regional and Industrial Policy Research paper, no. 47. European Policies Research Centre, University of Strathclyde, Glasgow.
Roelandt, T.J.A. and Hertog, P. (1999), 'Cluster analysis and cluster-based policy making: the state of the art', in OECD (1999), *Boosting Innovation: The Cluster Approach*, Paris: OECD.
Taylor, S. and Raines, P. (2001), 'Learning to let go: the role of the public sector in cluster building in the Basque Country and Scotland, developing cluster policies in seven European regions', Regional and Industrial Policy Research paper, no. 48, European Policies Research Centre, University of Strathclyde, Glasgow.

## Cluster Associations

www.acede.es (home appliances)
www.acicae.es (automotive components)
www.aclima.net (environment)
www.adimde.es (maritime)
www.afm.es (machine-tools)
www.clustenergia.com (energy)
www.clusterconocimiento.com (knowledge)
www.clusterpapel.com (paper)
www.gaia.es (telecommunications)
www.hegan.com (aeronautics)
www.uniporbilbao.es (port of Bilbao)

**Local Development Agencies**

www.bidasoa-activa.com (Bidasoa Activa)
www.bilbao.net/lanekintza (Bilbao)
www.debagoiena.net (Debagoiena)
www.debegesa.com (Debabarrena)
www.donostia.org (Donostia)
www.galdakao.net (Galdakaoko)
www.garapen.net (Garapen)
www.goieki.goierri.org (Goierri)
www.inguralde.com (Barakaldo)
www.iraurgilantzen.net (Urola Erdia)
www.oarsoaldea.net (Oarsoaldea)
www.tolosaldea.net (Tolosaldea)
www.uggasa.com (Urola Garaia)
www.vitoria-gasteiz.org (Gasteiz)

# 13. Is distance dead? High-tech clusters, analysis and policy perspectives

**Marco R. Di Tommaso, Daniele Paci, Lauretta Rubini and Stuart O. Schweitzer**

## 1. INTRODUCTION

Clusters are found in a wide variety of traditional industries, and both the agglomeration and location of firms in the manufacturing sector are frequently studied by students of industrial policy. Among the industries of the so-called 'new economy', however, there seems to be a paradox. On the one hand, high-technology firms are knowledge-based; therefore transportation costs have been drastically reduced, and commercial transactions are often not physical, but consist of intangible and intellectual outputs and factors. On the other hand, clusters and spatial proximity still have crucial importance for firms in this new generation of industries.

The popular perception that decreasing communication costs may reduce the importance of agglomeration is based on the idea that improving communication capabilities allows the decentralisation of many productive activities and may lead to the decline of clustering processes (*The Economist*, 1995; Bairstow, 2001). There are a number of factors that must be considered in order to explain the inconsistency between this perspective and reality. These considerations include the nature of the innovative process, the importance of tacit knowledge, the extremely high level of risk, the relevance of a highly specialised and skilled labour force, and the peculiar industrial structure that characterises the 'new economy' sectors.

This chapter refers to different relevant literatures, offering, in its final remarks, a selection of what we believe are the main policy issues.

## 2. INDUSTRIAL CLUSTERS

Clusters, industrial districts and networks are categories that the international literature has clearly accepted and adopted. 'Clusters' can be simply defined

as groups of firms operating in one specific industry within a determinate geographical area. Even if this general definition is the most widely accepted in the international literature,[1] dozens of refinements have been suggested.[2] After three decades of debate, it should be more than clear that clusters are different from the term 'industrial districts',[3] which are frequently discussed in the international literature. At the risk of oversimplifying complex socio-economic notions, many scholars look at industrial districts as a particular sub-typology of clusters characterised by the high propensity shown by firms and institutions to have relationships among each other, especially of a collaborative nature. A third term, 'network of firms', is also useful to note. Networks represent a different category of firms which, although not necessarily spatially concentrated, exploit the advantage of sectoral proximity and cooperation (Bergeron et al., 1998; Di Tommaso, 1999).

In all these typologies the focus goes beyond the individual firm. However, in the three cases, the physical distance between firms plays different roles. In the case of clusters, spatial proximity is the main feature. With industrial districts, the relationships among firms become the main characteristic in a context where distance among firms plays an important role. In the case of networks, relationships among firms define the system, while spatial distance becomes a less critical factor.

The literature on why firms cluster and what are the relevant factors that determine spatial agglomeration (or do not, as in the case of networks) is extensive. However, it is useful to divide these factors into two main categories. The first comprises natural factors or geographical benefits. These frequently include proximity to natural resources or raw materials, and ease of transportation to suppliers and consumers of the final products (Weber, 1909; Lösch, 1944). The second emphasises the advantages arising from synergies and interactions among firms. In the relevant literature, this category is traditionally referred to by the term 'agglomeration economies'. Richardson (1969) defines them as the benefits firms can enjoy by locating near one another, and divides them into three subsets: (a) scale economies, (b) localisation economies, and (c) urbanisation economies. Scale economies are internal to the individual firm, localisation economies are external to single firms but internal to the system of firms, and urbanisation economies are external both to individual firms and to the system of firms.

Literature on clustering focuses on the last two kinds of benefits. In particular, while analysing localisation economies, some authors emphasise the importance of competition at the local level (Porter, 1990). For other authors, the advantages deriving from the existence of a local market for particularly skilled workers or specialised inputs and services are noted. Still other authors note non-pecuniary forms of externalities (Scitovsky, 1954), such as knowledge spillovers (Krugman, 1991). Additionally, firms

can cluster in order to reduce the costs associated with the search for consumers (Prevezer, 1995) or because of the possibility of integrating either vertically or horizontally to lower costs or to raise product quality. These advantages do not exclude one another, but may have, on the contrary, a cumulative effect (Harris, 1954; Arthur, 1990). Moreover, as the industrial district literature has clearly shown, agglomeration economies can derive not only from the passive agglomeration of established firms, but also from intentional, strategic behaviour of firms, such as collaborations, agreements and so on (joint-action economies). Of course, these strategic collective actions can be promoted by both private and/or public forces.[4]

Without entering into the details of these arguments, it is useful to recall that as industrial development has always showed centripetal forces which have favoured agglomeration and clustering processes, at the same time there is also the possibility of generation of centrifugal forces which have induced migration of firms – a de-localisation process (Krugman, 1991; Swann et al., 1998).

With urbanisation economies, economists refer to the advantages that firms achieve by locating near or within a city. First of all cities can offer several types of services, both private (consulting activities, banks, insurance companies, financial services in general) and public (public administration offices, transport, health infrastructures, telecommunications, etc.). In addition, cities increase the likelihood of the presence of a qualified labour market, not only for executive functions, but also for administrative and even specialised production tasks. Furthermore, in many cases, being located in an urban context can allow firms to be in closer contact with their final consumers. Since all these factors are particularly relevant for small start-ups, the urban environment has been considered a sort of incubator for such firms (Ciciotti, 1998). Furthermore, because of the intersectoral nature of urbanisation economies (meaning that every type of industry can benefit from them), urban location is particularly advantageous for those firms having strong inter-industry connections.

## 3. CONCENTRATION IN HIGH-TECH INDUSTRIES

Throughout the chapter, the terms 'high-technology', 'technology-intensive' and 'technology-based' are used interchangeably to refer to firms and industries whose products or services embody new, innovative and advanced technologies developed through the application of scientific and technological expertise (Keeble et al., 1999). A 'high-tech' firm can be defined as a firm where technology plays a key role in determining competitive advantage, and the main factor of success is managing technology. Two aspects related

to this definition must be taken into account: the technological intensity (measured by the reliance on R&D activities, the complexity of product and process, or the frequency of technological change) and the high degree of technological innovation.

In this context we would like to explore how the traditional concept of agglomeration economies, useful in explaining concentration processes in traditional industries, has to be rewritten in the case of the emerging industries of the high-tech new economy.[5]

These industries have the following three characteristics:

1. R&D is the key activity and the importance of knowledge as both a productive factor and output is fundamental.
2. Innovation and technological changes represent the core processes.
3. Production activity is characterised by a high level of uncertainty and risk.

There are interactions among these characteristics and it is possible that the high degree of technological complexity characterising the productive process is likely to impact on the inputs and outputs as well. This means that the innovation process requires the presence of different sources of knowledge, that knowledge transfer is more difficult, that risks increase, and that a more specialised labour force is necessary.

Furthermore, the list of suggested features, which will be described in detail in the following part of the analysis, is far from being exhaustive and other factors may contribute to a more precise definition of high-technology firms and industries. However, further specification could be misleading, as it may be preferable to characterise only at a general level all the high-tech sectors, applying subsequent findings of the analysis to a particular industry.

### 3.1 Reliance on R&D and the Key Role of Knowledge

The passage from the 'old' to the 'new' economy implies a different concept of industry. In the 'old' industry research activity generated prototypes that were later replicated in the factory. The main cost was linked to the replication process. In the 'new' industry, on the contrary, replication costs tend substantially to disappear: the cost of replicating a software package or a biological cell is insignificant. Therefore, research becomes the core task and in many sectors firms of the new economy are more and more similar to research labs.

This change represents a shift from standardised production processes that can be 'footloose', seeking out the lowest-cost location, to non-routine

activities that are interested in carefully selecting the location of their core activity: production of research and knowledge.

Since in many cases the research output (knowledge) is a public good, firms may follow different behaviours. To simplify the picture and focus on the two opposite ends of a continuum we may argue that: (a) firms may internalise the core research activity and will look for 'isolation' in order to minimise their own spillovers. On the other hand, (b) firms will seek other firms' spillovers, thereby choosing their location within clusters of knowledge producers.

Both options appear reasonable, especially if we think that high-technology industries are usually identified as 'knowledge-intensive' to indicate that knowledge plays a key role, not only as an output, but also as an input to production.

Now, given that spillovers exist, how closely are spillovers linked to physical proximity among high-tech firms? In high-tech environments, there are two possible answers. First, there are firms that would like to reduce the chance that other competitors may benefit from their spillovers, and these firms will see spatial proximity as a risk. On the other hand, high-tech firms may explicitly try to exploit other firms' externalities, and will be more likely to seek spatial proximity to other firms.[6]

Choosing the right answer may be easier if we better define knowledge. A pervasive definition of knowledge may generate the perception that the dramatic decrease of communication costs would reduce the relevance of geographical proximity for industrial location. However, this conclusion is in contrast with the real-world evidence, which shows large numbers of successful high-tech agglomerations among internet companies; examples are found in the USA, France and other countries. Distinguishing between knowledge and information may help us understand how firms choose to locate. Burton-Jones's (1999) taxonomy of the terms 'data', 'information' and 'knowledge' is helpful here:

(a) data are defined as any signal which can be sent by an originator to a recipient;
(b) information is data which are intelligible to the recipient;
(c) knowledge is the cumulative stock of information and skills derived from the use of information by the recipient.

When the recipient is a human being, knowledge is the result of a (thinking or cognitive) brain process of the 'raw materials' supplied in the form of information. This leads to two considerations. The first is that while information can be easily codified and has a singular meaning and a unique interpretation, knowledge is 'interpreted information', and is therefore vague,

difficult to codify, subjective and often only serendipitously recognised. Therefore, while the marginal cost of transmitting data or even information across geographical space is insignificant because of the telecommunications revolution, the marginal cost of transmitting knowledge still rises with distance (Audretsch and Feldman, 1996).

In addition, the value of information depends on the recipient's prior knowledge. If one has no previous knowledge of a particular subject, it is usually difficult – if not impossible – to give the appropriate meaning to data and information related to that subject. Conversely, the more one knows about a subject, the better able he or she is to evaluate and use new data and information about it. This is the argument that traditionally explains the cumulative character of knowledge (Antonelli, 2000; Breschi, 2000).

Another explanation of the paradox arising from the agglomeration of high-tech industries in the internet era can be found in the distinction, introduced by Foray and Lundvall (1996), between 'software-knowledge' (or ideas) and 'wetware-knowledge' (or skills). The former is codified and stored outside the human brain, while the latter is stored in one's brain and hence cannot be dissociated from an individual. It comprises concepts, including convictions, abilities, talents and so on.

In the light of this distinction, it is clear that only for software-knowledge is it possible to have a process of codification, formalisation and translation into a standard and compact format. This process lowers the costs of storage, transmission and reproduction and allows the transfer of codified knowledge over long distances cheaply and quickly. Ideas can thus be used by any number of people simultaneously, and the cost of distribution is usually lower than the cost of production (David and Foray, 1995; Foray and Lundvall, 1996).

On the other hand, wetware-knowledge, also known as tacit knowledge, consists of highly specific technological know-how acquired after long-lasting learning processes. Therefore it cannot be easily transferred, since it is not stated in an explicit form and its transmission implies a process of codification and interpretation that requires frequent contacts and interactions (more likely face-to-face interactions) among agents. The clustering power of tacit knowledge has been emphasised by Von Hippel (1988), who uses the expression 'sticky knowledge' to underline its capacity to aggregate firms. The economy is increasingly dependent on the transmission of this complex uncodifiable knowledge, which is based on understanding and trust and not likely to be affected by the Internet, which allows 'long distance conversations, but not handshakes' (Leamer and Storper, 2001). The development of information and communication technologies favours the codification of knowledge in standard forms and its transfer over long distances at a substantially reduced cost (Antonelli, 1999; Burton-Jones,

1999; Breschi, 2000), but it is not influential on tacit knowledge, whose relevance in high-tech industries is increasing. As Polanyi (1967) wrote, 'We can know more than we can tell'. Although the boundary between tacit and explicit knowledge may shift, he argued convincingly that the foundation of all knowledge must remain inexplicit, because all knowledge contains elements that are implicit and tacit, rather than explicit and codifiable.[7]

Having said that, it is quite clear that in the new economy proximity still matters in transmitting knowledge, allowing firms to gain from knowledge spillovers.[8] Many studies suggest that R&D and other knowledge spillovers generate positive externalities that tend to be geographically bounded within the region where the new economic knowledge was created.[9]

## 3.2 Innovation as the Core Process

In analysing the forces that guide the clustering process in high-tech industries, we cannot avoid considering the role that innovation plays in such industries. And innovation is clearly favoured by agglomeration economies, which not only increase the static efficiency of productive processes, but also drive industrial dynamics. The creation of an 'industrial atmosphere', the presence of specialised services and advanced R&D infrastructures, the possibility of exchanging information and knowledge and of sharing similar experiences, can all significantly contribute to the increase of innovation opportunities and to a more rapid diffusion of technological advances (Marshall, 1890; Feldman, 1994; Breschi, 2000). In this sense, agglomeration economies act as 'dynamic economies', originating entrepreneurial creativity and innovation.

In order to fully understand the role of agglomeration economies in the innovation process, it is necessary to reflect on the dynamic changes that have affected such a process. For many years, the so-called 'linear model of innovation' has represented the conventional wisdom. Innovation was considered a straightforward, one-directional path whereby fruits of scientific research were translated into marketable goods through product development.[10] However, views about the nature and features of the innovative process have changed considerably in recent years, and the linear model has been found to be inadequate as it tends to oversimplify the organisational challenges that the process itself creates. In fact, innovation does not follow a mechanistic sequence from research to the market, and scientific discoveries or identified market needs are not the only possible sources of ideas for new products. Other types of knowledge and expertise can provide ideas for product and process innovation, such as the practical experience gained by using a product (von Hippel, 1988). Marketing or, more broadly, producer services, instead of simply representing perfunctory

end stages, may act as catalysts for new product development or for the introduction of new productive solutions.

A useful notion is to recognise that many innovations are the result not of a single 'breakthrough' technology, but represent the confluence of multiple technologies. The innovation consists of bringing together disparate ideas to create synergy. An example is the development of the computerised axial tomograph (CAT) scan. The CAT scan resulted from simultaneous breakthroughs in radiology, mathematics and computer science. Without any one of these developments the resulting technology could not have been produced.

Therefore Kline and Rosenberg (1987) suggest a 'feedback linkages model', which adds interdependencies and dynamic learning to the various stages of the innovation process. According to their view, innovation may be initiated at any stage, and tends to be circular rather than sequential. The limit of this model is that it focuses exclusively on the individual firm, while innovation is stimulated and influenced by many actors and sources of knowledge, both inside and outside the firm.[11] In fact, the innovation process is increasingly regarded as an evolutionary, non-linear and interactive process between the firm and its environment. Therefore innovation has both an internal dimension – sources of knowledge that firms find it advantageous to internalise – and an external dimension, comprising those sources that they do not internalise, because of high cost, high level of specialisation, or other constraints. Firms utilise these external sources through formal and informal strategic arrangements with the organisations that hold the knowledge bases. Feldman (1994) includes all these sources in the concept of technological (or knowledge) infrastructure that is composed of four main elements: university research, related firms and industries, industrial R&D and business services. In addition to these elements, proximity to end users of a new technology is another important source of external knowledge and ideas (Von Hippel, 1988).

One of the approaches most frequently used in the last decade to understand the complex relations constituting the innovation process is the 'national innovation system' (NIS) (Lundvall, 1992; Nelson, 1993). The notion of 'system'[12] implies that innovation is embedded in a context of interacting organisations and institutions, which enhances the efficiency of innovation processes. In such a framework, key actors are government and public institutions, research and technology organisations (such as public and private research institutes, universities, technology-specific research centres), and knowledge-intensive business enterprises (private companies and organisations relying heavily on professional knowledge and supplying intermediate knowledge-based products and services). All these organisations can exist to varying degrees in each national system,[13] and can interact in different ways (Acs, 1998; Farina and Preissl, 2000).[14]

Innovation in high-technology contexts requires continuous changes, and a technology flux. Therefore it is not important what a firm or a system knows at any one point in time, but whether and how it is able to evolve rapidly. In other words, it is more important to be able to acquire new skills continually than to possess a static stock of knowledge. For this reason Lundvall (1992) introduces the distinction between 'learning economies' and 'knowledge-based economies'. The traditional concept of learning economies refers principally to the economic effect of learning-by-doing (Arrow, 1962). But this concept is not adequate to explain the increasing complexity of the economic scenario, for it refers primarily to learning to do something better and better. Professionals such as surgeons and attorneys learn to improve the procedure they are called upon to undertake largely through repetition. This is also the process employed by technicians and other workers who try to raise productivity by doing something faster and better. But in the context of knowledge development, the 'task' keeps changing. What is important is to continually reassess problems and learn how to change the process to solve ever-changing problems. The shift in emphasis from 'learning-by-doing' to 'learning-by-using' (Rosenberg, 1976) and then to 'learning-by-interacting' (Lundvall, 1992) is determined by the increasing importance of spatial proximity between firms and of external sources of knowledge (similar firms, research and technology organisations, etc.). A critical component of the innovation process becomes the firm's 'absorptive capacity', that is, the ability to recognise new internal and external information sources and stimuli, to assimilate them, and to apply them for commercial ends (Cohen and Levinthal, 1990). Nearly 50 years ago, Polanyi suggested that the only way to create and acquire new knowledge is through a specific kind of social interaction similar to apprentice relationships. As a consequence, the learning process is specified by a full set of environmental and social factors. This is the foundation of the concept of 'collective learning' that is considered to be an intrinsic feature of the modern formulation of the 'innovative milieu' (Antonelli, 1999 and 2000; Capello, 1999).

Interactions among firms, between firms and universities, between firms and financial structures and also between firms and customers are crucial for innovative capacity and competitiveness in high-technology industries. The innovative process becomes increasingly complex and multisectoral; it encompasses several functions, and the skills and competencies required for one function might not be the same as those required for others.

## 3.3 Risk and Uncertainty

Clearly technological change is a dynamic process, which involves risk and uncertainty. The risk may relate to technological risk (will the technology

work?) and commercial risk (will the technology yield a return?). In general, free market economies will not contain a complete set of insurance markets on which this risk may be hedged, and thus innovators will inevitably bear risk.

Technological risk is increased by the 'knowledge-intensive' nature of high-tech firms because it is more difficult to predict both the nature and the suitability of outputs when they are derived from non-physical inputs, and it is more difficult for firms to appropriate returns from their products while these products are essentially 'intangibles'. In addition, risks are often associated with a 'competence gap' arising from the firm's limited ability to process and understand available information. Acceptance by the marketplace, bringing commercial rewards to innovative firms, plays a key role in the innovation process (Feldman, 2002). Innovations in high-tech industries are often so radical that in many cases it is difficult to predict the future demand for a new product or the implications of a new productive process. The reaction of the prospective users of a new technology represents an element of high insecurity. This risk is increased the more innovative the new output is. Especially when an innovation's success brings change to a large number and range of institutions, the risk is increased. History gives us many examples of products and services that relied upon many institutions being created to support the new idea. Henry Ford's automobile, for example, required a plethora of ancillary products to support his concept: tyres, lubricants, glass and electrical components, to name only a few. Additionally, consumers had to learn to drive the new devices, and municipalities had to agree to build paved roads. Even that wasn't the end of the story. Firms had to support the automobile's thirst for fuel by discovering petroleum and then producing and mass-marketing gasoline. In today's information age one might argue that the flow of innovations that challenge existing paradigms is even more rapid. Examples include computers, mobile telephones, and more complex medical treatments. Acceptance of a new technology is far more complex than merely appealing to the end user to use the new product or service.

In addition, the commercial risk of innovation is heightened by the fear of imitation that may limit the extent to which an innovator may obtain a return from innovative efforts (Stoneman, 1995). It is possible to note that the complexity of the outputs of high-tech firms contributes significantly to the increased insecurity on both the technological and commercial sides.

Firms often reach an acceptable level of risk in their research activities by adjusting their portfolios of projects to reflect both innovative projects and imitative projects. Pharmaceutical companies, for example, produce imitative, 'me-too' products along with 'blockbuster' products. The 'me-too' products will produce less profit, but they entail less risk because they

are building upon already successful products of other, competing, firms. The 'blockbuster' is highly desirable because of its profit potential, but the risk is much greater, and overemphasis on risky projects leaves the firm vulnerable.

These considerations have two effects with respect to firms' localisation and agglomeration. The first is that it is reasonable to assume that high-tech companies may locate near one another in order to reduce risks. The notion of agglomeration economies should be augmented to include benefits from the possibility of sharing risks among the clustered firms,[15] to highlight the importance of clustering as a mechanism that is able to reduce the uncertainty faced by firms in connection with the development and use of new technologies in a rapidly changing technological environment (Lundvall, 1988; Camagni, 1991; Saxenian, 1994; Di Tommaso et al., 2004).

Furthermore, in rapidly evolving fields, firms need specialised labour to reduce their competence gap. Therefore firms can gain access to specialised labour markets by locating near sources of knowledge (such as research centres and universities) or in clusters where the local concentration of firms in one industry generates a local market for specialised labour.

The second effect of uncertainty is linked to the financing of high-technology activities. As Von Burg and Kenney (2000) noted, financing of new ventures is assumed to be abundant, as financial backers of new firms are traditionally treated as readily available. If an innovation is sufficiently attractive, then it is assumed that the firm will have access to capital. However, it is important to stress the possibility that financing these activities is effectively limited by their risky nature and by their complexity. Financiers cannot always be assumed to understand the content of those processes that need to be financed. Therefore, recent analyses identify a key role of venture capital[16] within regional innovative systems, linked to the geographical proximity between investors and firms. In fact venture capital investments, at least in the USA, appear tightly clustered in areas with established concentrations of high-technology business (Smith and Florida, 1998), and hence it is possible to suggest that venture capital and firms have a 'symbiotic role' in the formation of high-tech clusters (Florida and Kenney, 1988).

## 4. THE CASE OF BIOTECH CLUSTERS

The first definition of biotechnology dates back to 1919, when Karl Ereki, a Hungarian engineer, used the term to refer to the science and methods that allow products to be obtained from raw materials with the aid of living organisms (OECD, 1999). Many definitions of biotechnology have been

offered since then,[17] but they all generally suggest use of living organisms to create new chemical processes. In a wide sense we can consider biotechnology as a collection of scientific techniques, developed during the 1970s and 1980s, that use living cells and their molecules to make products or services.[18] In order to distinguish the new technologies from the older methodologies of using living organisms – such as plant breeding and fermentation – it is usual to refer to 'modern biotechnology' or 'advanced biotechnology'. In this chapter we will analyse the biotech industrial sector considered as a whole, and not simply as a set of technologies.

In the USA, biotechnology is characterised by a relatively high concentration of firms, employment and activities in a relatively small number of regions. The largest of these concentrations are in the San Francisco Bay Area, Boston, San Diego, Seattle and the New York metropolitan area. The process of clustering of biotechnology firms is also taking place in Europe, where a small number of local clusters are capturing a dominant share of biotechnology firms and public research organisations. Some of these clusters (e.g. Oxford, Cambridge and Munich) are old and can rely upon a solid research background and high international reputation, coupled with a critical mass of both young and established spin-off companies and international contacts (European Commission, 2001).

As biotech is fundamentally a science-based technology, involving abstract and codified knowledge, its knowledge base should, in principle, be accessible to everybody, independent of the location of firms. None the less, firms in the biotechnology industry *do* cluster (see Schweitzer and Di Tommaso, 2003). What forces lead to this agglomeration of biotechnology activities?

It is possible that clustering is merely the aggregate outcome of individual firms' localisation decisions. This appears to be a view held by many. Prevezer (1995) and Swan et al. (1998), for example, stress that the mere presence of agglomeration externalities *per se* is not able to explain the growth of biotechnology clusters. In describing the early emergence of the sector they highlighted the importance of particular factors that appear to act as an attraction for the generation of the new biotechnology firms. It is useful to distinguish between leading biotech firms and following firms, as the location decision may be different for the two. Schweitzer et al. (2004) suggest that the leading firm is likely to be a spin-off from a research university or institute. The location of this spin-off firm will, of necessity, be near the research centre. This decision is more related to the spin-off process than it is to economies of agglomeration with other firms. But why do other firms come, later, to the same location? If a new firm is another spin-off, the answer is the same as before, but if the firm is an existing firm that is relocating, then the answers pertain to the benefits of agglomeration. We

now analyse clustering from these two different perspectives, distinguishing localisation from agglomeration dynamics.

**Localisation dynamics**

Prevezer (1995) and Swan et al. (1998) show that the mere presence of agglomeration externalities *per se* is not able to explain the growth of biotechnology clusters. At least in a first phase of emergence of the sector, they highlighted the importance of particular factors that act as a pole of attraction for generation of new biotechnology firms. Several factors contribute to create a particularly favourable environment for attracting biotech firms and developing biotech clusters. Among them, we select what we believe may be seen as the most important:[19]

1. Presence of a strong scientific base and close relationships between universities, industry and institutes, through cross-fertilisation and knowledge transfer mechanisms. In biotechnology, the 'Schumpeterian trilogy'[20] (Stoneman, 1995), or the distinction between science and technology (Nelson, 1993) and between basic and applied research (Breschi, 2000), can be misleading and not particularly meaningful. In fact, biotechnology is characterised by an extraordinary integration between industrial and scientific processes that seems to have no comparison in other high-technology sectors (Prevezer, 1995). Biotech R&D activity is predominantly basic research;[21] the value is created by new ideas, rather than new products. As a consequence, the knowledge required and produced by firms is mainly tacit and cannot be codified. Of course, when new ideas generate extraordinary returns and opportunities, as in the case of biotechnology breakthroughs, universities become strategic for the production process and it becomes usual to speak of 'entrepreneurial scientists'.[22] In this context, local technology transfer mechanisms acquire great importance, that is, processes by which basic understanding, information and innovations move from a university to firms operating in the private sector (Varga, 1997).[23] Among them it is possible to identify: transmissions via local personal networks of university and industry;[24] transfer through professional formal business relations, including academic spin-offs and technology licensing; and knowledge spillovers generated by commercial applications of university physical facilities, such as industrial incubators, industrial parks, libraries or computer services (Varga, 1997; Pavitt, 1998).
2. Access to highly specialised human capital and to key staff (proximity of firms and university, but also capability to attract high scientific and managerial talents). Access to graduate students and a supply of scientists and engineers represent important university–industry linkages.

As a consequence, regional labour markets of scientists are responsible for most of the local academic knowledge flow (Kenney, 1986). Faculty scientists are more likely to move to nearby firms when changing jobs and trained graduates may look for their first jobs close to the university (Audretsch and Feldman, 1996; Zucker and Darby, 1998; Zucker et al., 1998). Discoveries in this technological area are characterised by high degrees of natural excludability: techniques for their replication are not widely known and anyone wishing to build on new knowledge must gain access to the research team or laboratory that has that know-how (Zucker et al., 1998). In these circumstances, investor–scientists tend to enter into contractual arrangements with existing firms or start their own firm in order to extract the supernormal returns from the fruits of their intellectual contribution. And they tend to do so within commuting distance of their laboratories.

3. Entrepreneurial culture (commercial awareness and entrepreneurship of the scientific community and of the local population). The emergence of biotechnology requires the interconnection between a scientific system and an entrepreneurial system. The former provides knowledge and professional competencies, while the latter is a 'creator of demand' (Passaro and Vittoria, 2000). Adversity to risk and lack of entrepreneurial culture are often listed as weaknesses of some societies, including the Italian system in biotechnology (CENSIS, 2001; Breschi et al., 2003).
4. Multidisciplinarity and spillovers (application of other disciplines such as the use of supercomputers to codify the human genome). One of the most relevant features of biotechnology, as well as other epoch-making innovations (Patel and Pavitt, 1995) or emerging technological paradigms (Dosi, 1988), consists in the numerous and powerful interconnections between different types of industries that use biotechnology processes. Recent analyses underline increasing 'convergence' as a clear tendency that involves the biotech and several other sectors and technologies such as electronics and informatics (Di Tommaso and Schweitzer, 2004; Ernst & Young, 2000a, 2000b).
5. Normative conditions and a generally supportive policy environment (the regulatory framework, fiscal policy, etc.). A highly relevant issue is the protection of intellectual property rights. On average, biotech companies invest some 45 per cent of their annual income in R&D. Nearly half of the value of the industry is embedded in its intellectual capital (OECD, 1999). Therefore, appropriability of the R&D output is crucial.[25] An important example of a policy concerns university–firm collaboration. Biotechnology requires measures that can enable patentability of university research output because of the extreme reliance on public academic research.[26]

6. Availability of finance (venture capital, high yield bonds, etc.). The financing of biotechnology enterprises always constitutes a critical aspect of their development, and local availability of venture capital seems to play a key role (France Biotech, 2001; CENSIS, 2000; Smith and Florida, 1998). In addition, bio-incubators[27] are often considered relevant actors in the development of biotech (Ernst &Young, 2000a; France Biotech, 2001; CENSIS, 2001).
7. Premises and infrastructure (highways, railways, international airports, availability of labs, etc.).
8. Factors linked to climate, environmental amenities, facilities and quality of life, as factors able to attract the best human resources involved in all levels of the *filière*.

**Agglomeration dynamics**

Whether or not the collocation of similar and related firms has positive effects on the development of biotech clusters is important for policy development in biotech. The biotechnology industry is predominantly composed of new small firms (Audretsch, 1999; Cooke, 2001). Audretsch and Stephan (1996) suggest that the relatively small scale of most biotechnology firms is attributable to the 'diseconomies of scale inherent in the bureaucratic process which inhibits both innovative activity and the speed with which new inventions move through the corporate system towards the market' (Audretsch and Stephan, 1996, p. 642). It is possible that biotechnology firms show the characteristics of the theoretical prediction that in a modern economy (increasingly characterised by environmental complexity, reliance on knowledge sources, non-price competition mechanisms, vertical disintegration and higher specialisation), small size may provide advantages in terms of higher competitiveness and capability to innovate (Audretsch, 1999).[28]

An alternative hypothesis on biotech firm size is that their generally small size results from the extraordinarily high risks that the companies face, most firms not surviving long enough to grow to be large. The difference between these two hypotheses is important, because one idea suggests that firms are small because they function best that way, while the other suggests that they are small because they fail at such a high rate.

For whatever reason, small new biotechnology companies (NBCs) have not taken the place of large incumbent pharmaceutical firms (Henderson et al., 1999), though one biotechnology company, Amgen, has become as large as nearly any of the traditional pharmaceutical companies. A few other biotech companies, such as Genentech, are also large, even when measured against the older companies. As a consequence of the generally small size of

biotech firms, in contrast to the far larger pharmaceutical companies, two different types of production coexist in the pharmaceutical market. This has happened, probably, because NBCs and established pharmaceutical companies (EPCs) are characterised by 'complementary assets' (Malerba and Orsenigo, 2001).[29] Recent dynamics of the market structure in the pharmaceutical industry can be summarised in two stages. The first is the emergence of biotechnology, a window of opportunity for the growth of NBCs, as in Schumpeter's classic model of 'creative destruction'[30] (Mytelka and Pellegrin, 2001). Thereafter, market dynamics appear oriented towards a progressive vertical integration of production, as in the Schumpeterian phase of concentration associated with the hypothesis concerning the link between size and innovation (Mark II).[31] Pammolli and Riccaboni (2000) conclude that biopharmaceuticals are typically characterised by a well-articulated 'division of (innovative) labor' between larger established companies, and smaller, specialised biotech firms, where clustered firms show a tendency to be 'outward looking', creating alliances with pharmaceutical companies even in other nations.

Agglomeration can provide relevant advantages for small innovative knowledge-based firms. The presence of similar firms in one geographical area contributes to create a local market of scientists that determines competitive advantage for cluster regions.

The concept of 'collective learning' has been widely applied to biotech clusters, and interaction among firms is considered important not only for the transfer of tacit knowledge or to enjoy R&D localised spillovers, but also for the enhancement of trust (see Dupuy and Torre, Chapter 8 in this volume) and the creation of those social ties that are crucial for rapid and successful innovation adoption and diffusion. Furthermore, the level of risk – both technological and commercial[32] – in biotechnology is particularly high. Therefore, collocation of firms can enable small biotech companies to share risks and to have easier access to financial markets.

Finally, it is possible to note that joint actions within a cluster can also play a role in the emerging biotechnology industry. The creation of science parks is often a decision of clustered firms (as in the cases of Bio-Polo in Milan and DIXIT in Genoa) in order to enhance their linkages and to enjoy benefits from cooperation and collective actions. Increasingly the literature has stressed the importance of these factors in the innovation process (Antonelli, 1999; Keeble and Wilkinson, 1999; Feldman, 2002). Therefore, the mere presence of localisation factors must not obscure the key role of networking and interactions among firms at the local level (Asheim, 2001; Cooke, 2001).

**Different models of biotech clusters**

Clustering in biotechnology does not always follow similar paths. It is possible to recognise that different clustering models can be found in different national realities.

In the USA, the prevailing model is the agglomeration of biotech start-up companies formed by entrepreneurs and university professors, and funded by venture capital.[33] Therefore, in the development of biotechnology clusters university scientists and venture capitalists play a critical role. The role of government is limited to the design of enabling policies, that is, science and technology policies, regulations concerning the creation of new business enterprises, and policies concerning ownership of intellectual capital that define the incentives of the start-up enterprise and the 'incubator' university or research institute. The UK model for biotech development and clustering has followed a similar path to that in the USA, though the scale has been considerably smaller (CENSIS, 2000). The reason for the difference in industry scale may be due to differences in the size of the venture capital sector. Perhaps the most important implication of both the US and the UK models is that biotechnology development and clustering is the result of market forces, with government activity limited to creation of a legislative, legal and market climate that fosters development of spin-off enterprises and their subsequent clustering.

In France, on the other hand, the development of biotechnology and clusters formation is based on active government intervention. The French model for the promotion of high-technology sectors is also known as 'high-tech Colbertism' (CENSIS, 2000). Either the larger role for government is the result of conscious decisions to utilise tools of government planning to achieve what may be thought to be a more desirable end point with respect to the size and location of biotechnology firms, or it is seen as an essential step that may be able to compensate for the far smaller size of the venture capital market in France compared to that in the Anglo-Saxon countries. In France, agglomeration and proximity are judged as desirable objectives for industrial development: localisation choices are strongly guided and high-tech is the result of explicit policy plans and measures. An excellent summary of the development of two biotech clusters in France, Genopole and Futuroscope, has been developed by Katz-Benichou and Viens (2005). Genopole was funded initially by a philanthropic organisation that provides aid to patients suffering from genetic illnesses. Subsequent funding was provided by the national government. The development of Futuroscope, on the other hand, was the result of the success of a theme park which both provided seed funding for the biotech industrial park and encouraged the local government to fund it on a much greater scale.[34]

The importance of looking at alternative models to biotech clusters is that it shows that clusters can develop in varying economic, commercial and social settings. No single model is essential for successful development of high-technology industries.

## 5. FINAL REMARKS: PUBLIC POLICY AND PRIVATE COLLECTIVE STRATEGY

Many of the factors able to explain clustering process in high-tech are not so different from those that appear in the literature studying traditional clusters, and as discussed in many of the other chapters in this volume. But their nature, and the way they enter the picture, may differ. For example, in the new economy knowledge takes the place of traditional raw materials. It appears that what is important for firms is to be located in close proximity to sources of knowledge. These sources can be universities, research institutes or other similar or related (large or small) firms. In fact, the persistent tacit nature of knowledge means that personal contacts, imitation and frequent interactions are necessary for knowledge transmission. Having in mind the consideration of the previous paragraphs regarding the concept of knowledge, these dynamics are clearly possible at lower cost for firms and institutions located within the same area. Moreover, the presence of a local specialised labour market is still relevant, as well as the possibility of sharing risks in order to enable small innovative firms to be competitive with large competitors and potential incumbents.

Thus the new high-tech industry also shows a high propensity to cluster spatially.

Among the 'poles of attraction' of firms are universities and public/private research institutes that seem to play a critical role. Moreover, several reasons support the idea that high-tech firms may look for similar and related firms in order to gain economies from agglomeration. In particular, one should recognise the importance of collective actions and interactions among local firms.

In this picture, what is the role of industrial policy? The answer requires answering another question: have high-tech clusters been recognised as a public policy target worthy of being pursued? In other words, is it acknowledged that the development of these kinds of clusters will bring socially desirable outcomes? When one talks about mature industrialised countries, there is no doubt that the answer is yes.[35] Given that traditional manufacturing has been leaving European and North American countries at a rapid rate, primarily relocating to Asia, all of these countries have a strong interest in fostering their 'pole of knowledge' to attract high-technology

industries. The main challenge is how to maintain one's primacy in these industries, or in the case of some countries, to enter in the global network of poles which drive new economy industrial development.

Accepting this vision, now we have to discuss the instruments that might enable countries and regions to reach the goal. Two, at least, are the main focus of interest.

(a) *The source of knowledge*. Countries and regions must learn how to foster the main source of high-tech firm attraction – the public and private research institutions, including universities, research centres and laboratories. Of course the issue is not restricted to the strength of the scientific base. Other complementary factors have to be considered as well: the flexibility of the academic system, the mobility of the scientific labour market, the willingness to exploit commercially the results of academic research, and the institutional and legal context that makes it easier for leading academic scientists to become deeply involved with commercial firms.

(b) *Localisation choice*. In this respect, the main market force we can work on is the localisation choice at firm level that may encourage clustering processes in high-tech. Here we have at least three options.
   - Relying only on market incentives to direct the individual firm, following its own interest to assure a socially desirable outcome. Of course, in some cases the development of high-tech clusters will achieve this goal, and in other cases it will not.
   - Utilising the role of government to promote development of high-technology clusters. Government can create infrastructures, services and rules that may be able to make the selected area the best location for high-tech firms.
   - Utilising government as a back-up to encourage the process of agglomeration in areas when leading firms are not succeeding in either growing themselves or in attracting other firms to join in the cluster. This approach would concentrate government activity in promoting the production of the optimal amount of spillovers in order to encourage agglomeration and clustering.

To conclude, we believe that industrial policy should focus on the following issues to promote high-technology industrial clusters.

*Local public goods.* Successful clusters need public goods that the market may fail to produce in the optimal amount (see Bellandi, Chapter 4 in this volume). In the case of high-tech clusters, the crucial local public good is knowledge. However, since in many cases it may be possible for firms in

the cluster to have access to some knowledge without paying for it, there is always an incentive for firms to understate their own preferences. Thus these goods are likely to be underprovided due to the free-rider problem. Each firm will try to pay as little as possible, given the benefit, and the final result will be underprovision. Therefore, in such situations, in order to provide the optimal amount of local public goods, public policy (or private collective strategy) may be desirable.

*Internal relations.* Spatial proximity does not always ensure development of collective activity. Moreover, it is a common phenomenon that even joint action may fail. This is true because of joint action externalities: firms that have invested time and resources in collective actions may be induced to stop further cooperation because of the impossibility of excluding those actors who have not contributed. In this context an active role of the (private and public) collective bodies may be requested, a conclusion that is related to arguments by Bellandi (Chapter 4 in this volume) concerning the provision of different types of public goods, for example, and also to the governance-focused case analysis of more traditional, established industrial clusters in the ceramics and textiles industries by Sacchetti and Tomlinson (Chapter 11).

*Transaction costs.* The presence of a plurality of independent agents that interact but are not formally organised on a hierarchical basis constitutes an environment potentially favourable to the emergence of transaction costs. In any joint action information asymmetries and the fear of opportunistic behaviour are a continual source of transaction costs whose emergence contrasts with the potential offered by clustering (costs to be paid before the joint action to define the contract regulating the agreement, as well as costs to be paid after the agreement for monitoring the other parties' behaviour and for sanctioning any possible irregularities). However, firms often seem incapable of gathering, storing and processing the full information that would guarantee successful joint action. This is because the object of the joint action can be highly complex or because markets are characterised by a high degree of uncertainty which limits agents' vulnerability to free-riders. Thus in this framework it is clear that lowering transaction costs related to joint action implementation may be considered a priority for public policy and private collective strategies.

*Local collusion.* The great emphasis on joint action benefits emerging from many clusters, districts and networks of firms has led too often to the underestimation of collusive behaviour. Joint action can become collusive action resulting in non-competitive market structures, where individual

producers' decisions can affect quantity and price in the markets. In many local clusters of production, collective action may be implemented in order to maintain a firm's dominant position or to create a permanent barrier to entry. This kind of behaviour, of course, is not desirable and has to be sanctioned by the public policy authorities; again similarities can be drawn with the findings of Sacchetti and Tomlinson.

*External relations.* The markets for high-tech products are often worldwide, so that questions arise as to how such locally concentrated firms develop external links. High-tech clusters must remain outward-looking in order to be successful.[36] The continual, inward-looking accumulation of knowledge could lock firms into obsolete and increasingly non-competitive trajectories. In these circumstances, collective learning processes that function as barriers to entry to outsiders may be transformed into barriers to exit for insiders (Bianchi, 1989). Learning from external knowledge sources is therefore an essential process for the continued success of biotech clusters.

# NOTES

1. Among others, similar definitions have been proposed by Krugman (1991), Prevezer (1995) and Swann et al. (1998).
2. According to Hubert Schmitz (1998), a cluster includes not only a spatial and sectoral concentration of firms, but also of institutions. The definition elaborated by Michael Porter (1998) refers to clusters as sectoral concentrations of suppliers of final goods and services, input and specialised service providers, financial institutions and firms in related industries. This is the view also adopted in the report of the UK Department of Trade and Industry on Biotechnology clusters in UK (DTI, 1999). Philip Cooke (2001) focuses, instead, on the dynamic features of clusters that display a shared identity and future vision, that are characterised by 'turbulences' such as firm spin-offs and start-ups and that can be considered an arena of dense and changing linkages. See also the chapters in this volume by Bellandi, Henry and Pinch, Parilli, Pitelis and Pseiridis, and Sugden et al. (Chapters 4, 5, 10, 2 and 3, respectively), for discussion and/or use of different definitions of the term cluster.
3. See Becattini (1990) and, of course, Bellandi in this volume (Chapter 4).
4. See also Pitelis and Pseiridis (Chapter 2) in this volume for a detailed analysis of various theoretical and empirical arguments surrounding clusters and their productivity advantages, and, for example, the chapter by Henry and Pinch (Chapter 5) for a discussion focused on the specific advantages arising from the development and diffusion of knowledge.
5. Such a rewriting is in line with the adoption and development of a distinctive knowledge-based view of clusters by Henry and Pinch in Chapter 5 of this volume, and also has resonance with Parrilli's argument in Chapter 10 that there is a distinction between that cluster analysis which focuses on new competitive and technological frontiers and that which has relevance for less advanced clusters, such as so-called 'survival clusters'.
6. Such a choice might be thought of, for example, with relation to the Penrosean and Richardsonian influenced framework developed by Pitelis and Pseiridis in this volume (Chapter 2).
7. See also Henry and Pinch in this volume (Chapter 5) on the distinction between 'component' and 'architectural' knowledge.

8. Griliches (1995) has defined knowledge spillovers as 'working on similar things and hence benefiting much from each other's research'.
9. Jaffe (1989), Jaffe et al. (1993), Feldman (1994), Audretsch and Feldman (1996).
10. According to this model, the innovation process can be research-pushed or demand-pulled. See Feldman (1994), Stoneman (1995) and Christiansen (2001).
11. Innovation can be generally characterised as a basically uncertain process for solving problems, which mixes private with public knowledge. Knowledge can be private, coming primarily from the enterprises themselves but also from associations of enterprises and scientific and professional organisations, or public, drawn from institutions which conduct scientific and technical R&D. In this category are mainly universities, but also other public and semi-public research institutions and transfer bureaus (Dosi, 1988; Nelson, 1986).
12. Systems have been interpreted in a wide or in a narrow sense. The former encompasses the whole socio-economic environment (labour markets, financial institutions, the education system etc.), while the latter includes in the innovation system only the core R&D system, composed of firms, universities and research organisations (Lundvall, 1992; Freeman, 1995).
13. Although Nelson (1993) has outlined elements of cohesion that are strong enough to talk about 'systems' at a national level (dimension and homogeneity of markets and technological resources; informal interactive interrelations among producers and between producers and customers; technical interrelations between national industries; science and technology policies at national level), systems of innovation below the national level have been studied since the beginning of the 1990s, finding systemic coherence at different levels. A sectoral approach has been presented in the literature and a regional perspective on systems of innovation has also been widely used (Acs, 1998).
14. Other concepts of innovation as a system, such as the triple helix model (Etzkowitz and Leydesdorff, 2000) and Mode 2 (Gibbons et al., 1994), are proposed in literature. Despite the differences, all of them recognise the importance of external sources of knowledge, and of the intense relationships between firms and the environment, and they assume the innovative enterprise as a dynamic, learning organisation.
15. Reputation spreads quickly within a cluster, helping financial providers to judge who the good entrepreneurs are (DTI, 1999).
16. For a comprehensive analysis of the role of venture capital in the process of technological innovation, see Smith and Florida (1998).
17. See, among others, Kenney (1986) and Buiatti (2001).
18. Formally, the birth of new biotechnologies coincides with the beginning of the so-called 'biotech revolution', started in 1973. In that year, Stanley Cohen of Stanford and Herbert Boyer of University of California–San Francisco discovered the basic technique for recombinant DNA (rDNA), which became the basis for genetic engineering. The other basic technology is cell fusion used for the first time by Köhler and Milstein to create monoclonal antibodies (MABs). For comprehensive analysis of these aspects see Kenney (1986) and Zucker et al. (1998).
19. DTI (1999), CENSIS (2000), Leoni, (2000), Malerba and Orsenigo (2001).
20. The technological change process is traditionally divided into three stages: invention process, encompassing the generation of new ideas, innovation, encompassing the development of new ideas into marketable products and processes, and the diffusion stage, in which the new products and processes spread across the potential market.
21. Traditionally, basic research is undertaken by universities or public institutes, because of problems of appropriability and market failure (see Geroski, 1995; Breschi, 2000; McMillan et al., 2000).
22. For a comprehensive analysis of the changed nature of the university, see Etzkowitz and Leydesdorff (2000), who introduced the issue of a 'third academic revolution'. This revolution has led universities to acquire the new task of economic development, beside the traditional tasks of teaching and researching. See also the chapter in this volume by Aranguren et al. (Chapter 12), who argue that universities should be playing a larger developmental role in the context of clusters in the Basque Country region of Spain.

23. Not every form of university knowledge transfer requires spatial proximity. Scholarly journal publications or faculty consulting in industry can convey knowledge from academic institutions to private firms over large distances and, similarly, different forms of cooperation in research and development between industry and academia – such as industry-sponsored contract research, long-term university–industry research agreements and industry-financed research centres – channel university expertise to distant locations. However, in many cases (especially when academic knowledge is in its evolving non-codified stage, as in the case of biotech industry) successful knowledge transfers between university and high-technology firms require spatial proximity.
24. In addition to a local labour market of professionals, several forms of personal connections, such as seminars attended by scientists from industry or local professional associations, strengthen the local network between academia and the biotech industry (Saxenian, 1994).
25. Many authors have stressed the importance of intellectual property right protection in biotechnology. Among others, see Cumming and Macintosh (2000), Leoni, (2000), and Thumm (2001). However, many issues are related to the moral justification of biotech patents, especially because biotechnology utilises and produces living organisms. For a comprehensive analysis on this issue see Aglialoro (2001) and Buiatti (2001). In addition, some authors have stressed the importance of considering also negative effects of patents, such as the increase of transaction costs, the possible restriction to consumption, limitations in product availability and maintenance of unnecessarily high prices (OECD, 1999). Furthermore, the diffusion of a too permissive attitude towards the granting of broad claims on patents might actually slow down the process of diffusion and circulation of knowledge and hence the future rate of technological advance (Malerba and Orsenigo, 2001).
26. The American 'Bayh–Dole Act' is frequently quoted as a successful system of protection of academic intellectual property (Giesecke, 2000; Breschi et al., 2003).
27. These are highly specialised enterprises (both private and public) that are able to help a new company and its founder through all the stages of development, offering to new entrepreneurs intellectual and technological resources necessary to create new firms (both start-up and spin-off firms), supporting business plan construction, speeding up access to the market and reinforcing relationships with investors.
28. See also the chapters by Pitelis and Pseiridis (Chapter 2) and Henry and Pinch (Chapter 5) in this volume.
29. NBCs lacked competencies in crucial aspects of the innovative process, in particular knowledge and experience of clinical testing and other procedures related to product approval on the one hand and marketing on the other. Thus they exploited their essential competence and acted primarily as research companies and specialised suppliers of high-technology intermediate products, performing contract research for and in collaboration with established pharmaceutical corporations. This provided NBFs with the financial resources necessary to fund R&D and access to organisational capabilities in product development and marketing. Established companies faced the opposite problem, that is, they lacked flexibility and specialisation to adopt quickly the new technological paradigm.
30. This phase of innovation is usually indicated as 'Mark I' (Nooteboom, 2000).
31. It can be said that in the first phase NBCs and EPCs have entailed competitive interaction, while thereafter cooperation has prevailed. See Ernst & Young (2001a and 2001b) for analysis of recent mergers and acquisitions in the biotechnology market.
32. A comprehensive analysis of the risks connected to biotech production is provided by Buiatti (2001).
33. See Kenney (1986), Zucker and Darby (1998), Zucker et al. (1998).
34. See also the chapter by Aranguren et al. (Chapter 12) for an analysis of government involvement in cluster policy in the Basque region of Spain, and that by Gilly and Perrat (Chapter 7) for further insight into the territorial dynamics of government policy in France.

35. Compare, however, Parrilli's analysis of clusters in less developed countries in Chapter 10 of this volume.
36. See for example the analysis of De Propris and Driffield in Chapter 6, which suggests a role for knowledge-based clusters in strategically attracting quality FDI that provides mutually beneficial spillovers.

# REFERENCES


Acs, Z.J. (ed.) (1998), *Regional Innovation, Knowledge and Global Change*, London and New York: Pinter.

Aglialoro, G. (2001), *Il Diritto delle Biotecnologie*, Turin: Giappichelli.

Antonelli, C. (1991), 'The evolution of the industrial organization of the production of knowledge', *Cambridge Journal of Economics*, **23**, 243–60.

Antonelli, C. (2000), 'Collective knowledge communication and innovation: the evidence of technological districts', *Regional Studies*, **34** (6), 535–47.

Arrow, K.J. (1962), 'Economic welfare and the allocation of resources for invention', in R.R. Nelson (ed.), *The Rate and Direction of Innovative Activity: Economic and Social Factors*, Princeton: Princeton University Press, pp. 609–25.

Arthur, W.B. (1990), 'Positive feedbacks in the economy', *Scientific American*, **221**, 92–9.

Asheim, B. (2001), 'Learning regions at development coalitions: partnership as governance in European workfare states? Concepts and transformation', *International Journal of Action Research and Organizational Renewal*, **6** (1), 73–101.

Audretsch, D.B. (1999), 'Knowledge spillovers and the role of small firms', paper presented at the International Conference 'Knowledge Spillovers and The Geography of Innovation: A Comparison of National Systems of Innovation', Saint-Etienne, 1–2 July.

Audretsch, D.B. and Feldman, M. (1996), 'R&D Spillovers and the geography of innovation and production', *American Economic Review*, **86** (3), 630–40.

Audretsch, D.B. and Stephan, P.E. (1996), 'Company–scientist locational links: the case of biotechnology', *American Economic Review*, **86** (3), 641–52.

Bairstow, J. (2001), 'The death of distance', *Laser Focus World*, August, p. 248.

Becattini, G. (1990), 'The Marshallian industrial district as a socio-economic notion', in F. Pyke, G. Becattini and W. Sengenberger (eds), *Industrial Districts and Inter-firm Co-operation in Italy*, Geneva: ILO, pp. 37–51.

Bergeron, S., Lallich, S. and Le Bas, C. (1998), 'Location of innovating activities, industrial structure and techno-industrial clusters in the French economy, 1985–1990. Evidence from US patenting', *Research Policy*, **26**, 733–51.

Bianchi, P. (1989), 'Concorrenza dinamica, distretti industriali e interrenti locali', in F. Gobbo (ed.), *Distretti e Sistemi Produttivi alle Soglie Degli anni Novanta*, Milan: Franco Angeli.

Breschi, S. (2000), 'La geografia delle innovazioni tecnologiche', in F. Malerba (ed.), *Economia dell'Innovazione*, Rome: Carocci, pp. 343–72.

Breschi, S., Lissoni, F. and Orsenigo, L. (2003), 'Success and failure in the development of biotechnology clusters: the case of Lombardy', in G. Fuchs (ed.), *Biotechnology in Comparative Perspective*, London: Routledge.

Buiatti, M. (2001), *Le Biotecnologie*, Bologna: Il Mulino.

Burton-Jones, A. (1999), *Knowledge Capitalism: Business, Work, and Learning in the New Economy*, Oxford: Oxford University Press.

Camagni, R. (1991), 'Local "milieu", uncertainty and innovation networks: towards a new dynamic theory of economic space', in R. Camagni (ed.), *Innovation Networks: Spatial Perspectives*, London: Belhaven, pp. 121–42.

Capello, R. (1999), 'Spatial transfer of knowledge in high technology milieux: learning versus collective learning processes', *Regional Studies*, **33** (4), 353–65.

CENSIS – Forum per la Ricerca Biomedica (2000), *Cultura Scientifica e Ricerca Biotecnologica*, available at http://www.censis.it/censis/ricerche/2000/frbiomedica.

CENSIS – Forum per la Ricerca Biomedica (2001), *Nuovi Pazienti e Biotecnologie. Paradigmi innovativi del Sistema della Salute*, Milan: Franco Angeli.

Christiansen, A.C. (2001), *Technological Change and the Role of Public Policy: an Analitical Framework for Dynamic Efficiency Assessments*, The Fridtjof Nansen Institute Report no. 4, available at: http://158.36.155.230/pdf/01–4-acc.pdf.

Ciciotti, E. (1998), *Competitività e Territorio*, Rome: La Nuova Italia Scientifica.

Cohen, W.M. and Levinthal, D.A. (1990), 'Absorptive capacity: a new perspective on learning and innovation', *Administrative Science Quarterly*, **35**, 128–42.

Cooke, P. (2001), 'Regional innovation systems, clusters, and the knowledge economy', *Industrial and Corporate Change*, **10** (4), 945–74.

Cumming, D.J. and Macintosh, J.G. (2000), 'The determinants of R&D expenditures: a study of the Canadian biotechnology industry', *Review of Industrial Organization*, **17** (4), 357–70.

David, P. and Foray, D. (1995), 'Accessing and expanding the science and technology base', *STI Review*, no. 16, Paris: OECD.

Di Tommaso, M.R. (1999), 'Efficienza collettiva, i nodi della politica', Università di Ferrara, Facoltà di Economia, Quaderni del Dipartimento, no. 13, June.

Di Tommaso, M.R., Paci, D. and Schweitzer, S.O. (2004), 'Clustering of intangibles', in P. Bianchi and S. Labory (eds), *The Economic Importance of Intangible Assets*, Aldershot: Ashgate.

Dosi G. (1998), 'The nature of the innovative process', in Dosi, G., Freeman, C., Nelson, R., Silverberg, G. and Soete, L. (eds), *Technical Change and Economic Theory*, London and New York: Pinter, 221–38.

DTI (Department of Trade and Industry, UK) (1999), *Biotechnology Clusters*, report no. 1888, available at http://biotechknowledge.com/showlibsp.php3?uid=1.

Ernst & Young (2000a), *Convergence: Ernst & Young's Biotechnology Industry Report*, Millennium edn, New York: Ernst & Young LLP.

Ernst & Young (2000b), *In a Field of Force: Trends Shaping the Health Industry*, New York: Ernst & Young LLP.

Etzkowitz, H. and Leydesdorff, L. (2000), 'The dynamic of innovation: from National Systems and "Mode 2" to a Triple Helix of university–industry–government relations', *Research Policy*, **29**, 109–23.

European Commission (2001), *The European Competitiveness Report 2001*, Luxembourg: Office for Official Publications of the European Communities.

Farina, C. and Preissl, B. (2000), *Research and Technology Organizations in National Systems of Innovation*, DIW Discussion Papers, no. 221, July.

Feldman, M.P. (1994), *The Geography of Innovation*, Boston: Kluwer Academic Publishers.

Feldman, M.P. (2002), 'The internet revolution and the geography of innovation', *International Social Science Journal*, **54**, 47–56.

Florida, R. and Kenney, M. (1998), 'Venture capital-financed innovation and technological change in the USA', *Research Policy*, **17**, 119–37.

Foray, D. and Lundvall, B.A. (eds) (1996), *Employment and Growth in the Knowledge-Based Economy*, Paris: OECD.

France Biotech (2001), *Biotechnologies in France*, available at http://www.france-biotech.org

Freeman, C. (1995), 'National systems of innovation (historical perspective)', *Cambridge Journal of Economics*, **19** (1), 1–19.

Geroski, P. (1995), 'Markets for technology: knowledge, innovation and appropriability', in P. Stoneman (ed.), *Handbook of the Economics of Innovation and Technological Change*, Oxford, UK and Cambridge, USA: Blackwell, pp. 90–131.

Gibbons, M., Limoges, C., Nowotony, H., Schwartzman, S., Scott, P. and Trow M. (1994), *The New Production of Knowledge: the Dynamics of Science and Research in Contemporary Society*, London: Sage.

Giesecke, S. (2000), 'The contrasting roles of government in the development of biotechnology industry in the US and Germany', *Research Policy*, **29** (2–3), 205–23.

Griliches, Z. (1995), 'R&D and productivity: econometric results and measurement issues', in P. Stoneman (ed.), *Handbook of the Economics of Innovation and Technological Change*, Oxford, UK and Cambridge, USA: Blackwell, pp. 52–89.

Harris, C.D. (1994), 'The market as a factor in the location of production', *Annals of the Association of American Geographers*, **44**, 315–48.

Henderson, R., Orsenigo, L. and Pisano, G. (1999), 'The pharmaceutical industry and the revolution in molecular biology: interactions among scientific, institutional and organisational change', in D. Mowery and R. Nelson (eds), *Sources of Industrial Leadership*, New York: Cambridge University Press, pp. 267–311.

Jaffe, A. (1989), 'Real effects of academic research', *American Economic Review*, **79** (5), 957–70.

Jaffe, A.B., Trajtenberg, M. and Henderson, R. (1993), 'Geographic localization of knowledge spillovers as evidenced by patent citations', *Quarterly Journal of Economics*, **63** (3), 577–98.

Katz-Benichou, G. and Viens, G. (2005), 'High-technology clusters in France: two unusual models – an empiric study', in M.R. Di Tommaso and S.O. Schweitzer (eds), *Health Policy and High-tech Industrial Development: Learning from Innovation in the Health Industry*, Cheltenham, UK and Northampton, MA: Edward Elgar, 258–78.

Keeble, D. and Wilkinson, F. (1999), 'Collective learning and knowledge development in the evolution of regional clusters of high technology SMEs in Europe', *Regional Studies*, **33** (4), .295–303.

Kenney, M. (1986), *Biotechnology: the University–Industrial Complex*, New Haven: Yale University Press.

Kline, S.J. and Rosenberg, N. (1987), 'An overview of innovation', in R. Landau and N. Rosenberg (eds), *The Positive Sum Strategy*, Washington, DC: National Academy Press.

Krugman, P. (1991), *Geography and Trade*, Cambridge, MA: MIT Press.

Leamer, E.E. and Storper, M. (2001), *The Economic Geography of the Internet Age*, NBER Working Paper, No. W8450, available at http://papers.nber.org/papers/W8450.

Leoni, G.P. (2000), 'Copertura brevettuale delle biotecnologie', paper presented at the conference 'Bioetica & Biosicurezza: quali regole per il futuro?', Rome, 26 October.

Lösch, A. (1944), *Die Raumliche Ordnung der Wirtschaft*, 2nd edn, Jena: Fischer; translation by W.H. Wolgom (1954), *The Economics of Location*, New Haven: Yale University Press.

Lundvall, B.A. (1988), 'Innovation as an interactive process: from user-producer interaction to the national system of innovation', in G. Dosi, C. Freeman, G. Silverberg and L. Soete (eds), *Technical Change and Economic Theory*, London and New York: Pinter, pp. 349–69.

Lundvall B.A. (1992), *National Systems of Innovation. Towards a Theory of Innovation and Interactive Learning*, London: Pinter Publishers.

Malerba, F. and Orsenigo, L. (2001), 'Innovation and Market Structure in the Dynamics of the Pharmaceutical Industry and Biotechnology: Towards a History Friendly Model', paper presented at the 'DRUID Conference', Aalborg, 12–15 June.

Marshall, A. (1890), *Principles of Economics*, London: Macmillan; Italian version, *Principi di Economia*, Turin: UTET, 1977.

McMillan, G.S., Narin, F. and Deeds, D.L. (2000), 'An analysis of the critical role of public science in innovation: the case of biotechnology', *Research Policy*, **29** (1), 1–8.

Mytelka, L.K. and Pellegrin, J. (2001), 'Can SMEs Survive? Static vs Dynamic Externalities in the French Biotechnology Industry', paper presented at the 'DRUID Conference', Aalborg, 12–15 June.

Nelson, R.R. (1986), 'Institutions supporting technical advance in industry', *American Economic Review*, **76** (2), 186–9.

Nelson, R.R. (ed.) (1993), *National Innovation Systems: A Comparative Analysis*, New York: Oxford University Press.

Nooteboom, B. (2000), *Learning and Innovation in Organizations and Economies*, Oxford: Oxford University Press.

OECD (1999), 'Modern Biotechnology and the OECD', in *Policy Brief*, June.

OECD (2001), *OECD Science, Technology and Industry Scoreboard. Towards a Knowledge-based Economy*, Paris: OECD.

Pammolli, F. and Riccaboni, M. (2000), *Technological Competencies in Networks of Innovators. The Case of Biopharmaceuticals*, mimeo.

Passaro, R. and Vittoria, M.P. (2000), 'Modalità di nascita e di evoluzione delle imprese di biotecnologia in Italia', *Economia e Politica Industriale*, no. 108, 69–96.

Patel, P. and Pavitt, K. (1995), 'Patterns of technological activity: their measurement and interpretation', in P. Stoneman (ed.), *Handbook of the Economics of Innovation and Technological Change*, Oxford: Blackwell.

Pavitt, K. (1998), 'The social shaping of the national science base', *Research Policy*, **27**, 793–805.

Polanyi, M. (1967), *The Tacit Dimension*, London: Routledge.

Porter, M. (1990), *The Competitive Advantage of Nations*, New York: Free Press.

Porter, M. (1998), 'Clusters and the new economics of competition', *Harvard Business Review*, November–December, 77–90.

Prevezer, M. (1995), 'The dynamics of industrial clustering in biotechnology', *Small Business Economics*, no. 9, 255–71.

Richardson, H.W. (1969), *Regional Economics*, London: Weidenfeld and Nicolson.

Rosenberg, N. (1976), *Perspective on Technology*, Cambridge: Cambridge University Press.

Saxenian, A.L. (1994), *Regional Advantage: Cultural and Competition in Silicon Valley and Route 128*, Cambridge, MA: Harvard University Press.

Schmitz, H. (1998), 'Fostering collective efficiency', *Small Enterprise Development*, **9** (1), 4–11.

Schweitzer, S.O., Connell, J. and Schoenberg, F. (2004), 'Factors underlying high-technology industrial clusters in the United States', in M.R. Di Tommaso and S.O. Schweitzer (eds), *Health Policy and High-Tech Industrial Development: Learning from Innovation in the Health Industry*, Cheltenham: Edward Elgar.

Schweitzer, S.O. and Di Tommaso, M.R. (2003), 'Why do biotechnology firms cluster? Some possible explanations', in R. Sugden, R.H. Cheng and R. Meadows (eds), *Urban and Regional Prosperity in a Globalised, New Economy*, Cheltenham: Edward Elgar, pp. 181–95.

Scitovsky, T. (1954), 'Two concepts of external economies', *Journal of Political Economy*, **LVII** (2), 70–82.

Smith, D.F. and Florida, R. (1998), 'Venture capital's role in regional innovation systems: historical perspective and recent evidence', in Z.J. Acs (ed.), *Regional Innovation, Knowledge and Global Change*, London and New York: Pinter.

Stoneman, P. (ed.) (1995), *Handbook of the Economics of Innovation and Technological Change*, Oxford: Blackwell.

Swann, G.M.P., Prevezer, M. and Stout D. (1988), *The Dynamics of Industrial Clustering*, Oxford: Oxford University Press.

*The Economist*, 'The Death of Distance', September 1995.

Thumm, N. (2001), 'Management of intellectual property rights in European biotechnology firms', *Technological Forecasting and Social Change*, **67**, 259–72.

Varga, A. (1997), 'Regional economic effects of university research: a survey', available at http://www.rri.wvu.edu/wpapers/pdffiles/surveyattila.pdf.

Von Burg, V. and Kenney, M. (2000), 'Venture capital and the birth of the local area networking industry', *Research Policy*, **29**, 1135–55.

Von Hippel, E. (1988), *The Sources of Innovation*, New York: Oxford University Press.

Weber, A. (1909), *Theory of the Location of Industries*, Chicago: University of Chicago Press.

Zucker, L.G. and Darby, M.R. (1998), 'Intellectual human capital and the birth of U.S. biotechnology enterprises', *American Economic Review*, **88** (1), 290–306.

Zucker, L.G., Darby, M.R. and Armstrong, J. (1998), 'Geographically localised knowledge: spillovers or markets?', *Economic Inquiry*, **XXXVI**, 65–86.

# Index