



Regional Policy and Development 18

Edited by
James Simmie

**Innovation,
Networks and
Learning Regions?**

Innovation, Networks and Learning Regions?

Regional Policy and Development Series

Series Editor: Ron Martin, Department of Geography, University of Cambridge

Throughout the industrialised world, widespread economic restructuring, rapid technological change, the reconfiguration of State intervention, and increasing globalisation are giving greater prominence to the nature and performance of individual regional and local economies within nations. The old patterns and processes of regional development that characterised the post-war period are being fundamentally redrawn, creating new problems of uneven development and new theoretical and policy challenges. Whatever interpretation of this contemporary transformation is adopted, regions and localities are back on the academic and political agenda. *Regional Policy and Development* is an international series which aims to provide authoritative analyses of this new regional political economy. It seeks to combine fresh theoretical insights with detailed empirical enquiry and constructive policy debate to produce a comprehensive set of conceptual, practical and topical studies in this field. The series is not intended as a collection of synthetic reviews, but rather as original contributions to understanding the processes, problems and policies of regional and local economic development in today's changing world.

Innovation, Networks and Learning Regions?

Edited by James Simmie

Regional Policy and Development Series 18

Jessica Kingsley Publishers

London and Bristol, Pennsylvania

Regional Studies Association

London

This book is dedicated to my mother, MFS, whose dining
room table still bears the scars of lengthy earlier studies

All rights reserved. No paragraph of this publication may be reproduced, copied or transmitted save with written permission or in accordance with the provisions of the Copyright Act 1956 (as amended), or under the terms of any licence permitting limited copying issued by the Copyright Licensing Agency, 33–34 Alfred Place, London WC1E 7DP. Any person who does any unauthorised act in relation to this publication may be liable to criminal prosecution and civil claims for damages.

The right of the contributors to be identified as authors of this work has been asserted by them in accordance with the Copyright, Designs and Patents Act 1988.

First published in the United Kingdom in 1997 by
Jessica Kingsley Publishers Ltd
116 Pentonville Road
London N1 9JB, England
and
1900 Frost Road, Suite 101
Bristol, PA 19007, U S A
with
The Regional Studies Association
Registered Charity 252269

This edition published in the Taylor & Francis e-Library, 2005.

“To purchase your own copy of this or any of Taylor & Francis or Routledge’s collection of thousands of eBooks please go to www.eBookstore.tandf.co.uk.”

Copyright © 1997 the contributors and the publisher

Library of Congress Cataloging in Publication Data

A CIP catalogue record for this book is available from the Library of Congress

British Library Cataloguing in Publication Data

Innovation, networks and learning regions?.—(Regional
policy and development; 18)

1. Economic geography 2. Economic policy 3. Economic
development

I. Simmie, J.M. (James, Martin), 1941–
338.9

ISBN 0-203-64355-0 Master e-book ISBN

ISBN 0-203-66977-0 (Adobe eReader Format)

ISBN 1-85302-402-3 (Print Edition)

Contents

Part I. Introduction

1. Origins, Structure and Contents 2
James Simmie

Part II. Core Metropolitan Regions

2. The Origins and Characteristics of Innovation in Highly Innovative Areas: the Case of Hertfordshire 11
James Simmie
3. The Financial and Entrepreneurial Characteristics of Innovative Small Firms in Contrasting Regional Environments of the UK 30
Pooran Wynarczyk Alfred Thwaites Peter Wynarczyk
4. Technopolitan Spaces in the Greater Paris Region and the International Restructuring of Firms 48
Jeanine Cohen
5. What Comprises a Regional Innovation System? Theoretical Base and Indicators 63
Heidi Wiig Michelle Wood

Part III. Peripheral Regions

6. Competitiveness and the Global Region: The Role of Networking 97
Robert Huggins
7. The Emerging Shape and Form of Innovation Networks and Institutions 120
Andy Pratt
8. The Japanese Technopolis Strategy 133
Sang-Chul Park

- 9 New Industrial Spaces and National Technology Policies: 156
 The Case of Kyushu and the Japanese 'Technopolis
 Strategy'
Rolf Sternberg

Part IV. Technology Transfer

- 10 After Technopoles: Diffused Strategies for Innovation and 176
 Technology Transfer
NicKomninos
- 11 Local Economic Development Strategies and Information 191
 and Communication Technologies
Keith TannerDavid Gibbs
- 12 National Laboratories and Regional Development: Case 207
 Studies from the UK, France and Belgium
Helen Lawton Smith

Part V. Conclusions

- 13 Summary and Conclusions 229
James Simmie
- The Contributors 237
- Subject Index 238
- Name Index 246

PART I

Introduction

CHAPTER 1

Origins, Structure and Contents

James Simmie

Introduction

This book was inspired by a series of sessions on 'Innovation and Regional Development' conducted at the Regional Studies Association conference on 'Regional Futures: Past and Present, East and West' held in Gothenberg in May 1995. Innovation and economic development were themes which reappeared constantly not only in this but also in other strands of this excellent international meeting. Within these major themes some key issues emerged which were frequently addressed in subsequent discussions. This volume contains selected research which addresses these key issues from different theoretical, empirical and national perspectives.

These key issues, which form the linked focus of the substantive parts of this book, are:

- Core metropolitan regions—This part examines the role played by core metropolitan regions as the major locations and sources of innovations and their subsequent profitable development.
- Peripheral regions—This part analyses the problems faced by more peripheral regions in overcoming their comparative disadvantages with respect to innovative capacities and the public policies developed to reduce their disadvantage.
- Technology transfer—Here the focus is on the question of whether essential technology transfers can best take place in terms of information movement using electronic techniques or knowledge transfer requiring the movement of people.

The concluding part draws out the linking themes presented in the separately authored chapters. Many of these themes are concerned with the need for regions to develop and remain competitive in the global market-place by constant innovation. In seeking to achieve this goal they need to face in two directions at once. On the one hand they must build and maintain their own distinctive

regional innovation systems capable of generating continuous change and on the other they must compete in global markets full of regions and firms all attempting to do much the same thing. This essential double focus is described as the 'global/local interface'.

Part II of the book is concerned with the innovative performance of firms in the south-east of England and the Greater Paris region. In Chapter 2, James Simmie reports on some preliminary results of a study of award-winning firms in Hertfordshire. This is an area, within the London western arc, which has been among the relatively most innovative in the UK. The characteristics of award-winning product and process innovations are examined—together with the local factor conditions, customer and demand conditions, related and supporting industries, and firm strategy, structure and rivalry that contributed to them.

The findings of this study suggest that local networking is not normally significant in such regions. Instead, the demand for local high quality staff is crucial. This is often combined with the ability to access international markets relatively easily from the south-east. The study also suggests that government regulations are not significant with respect to particular innovations. Industrial sectors tend to remain distinct from one another. They do, however, often rely on generalised local office support services which do not usually involve much in the way of high technology.

In Chapter 3, Pooran Wynarczyk and Alfred Thwaites contribute to the debate surrounding regional economic development and, in particular, the role of small and medium sized enterprises (SMEs) in this process. They examine empirically the influence of a number of entrepreneurial and regional factors on the financial performance of a sample of 170 innovative small firms. The empirical analysis, based upon Companies House data, examines the relative explanatory power of a number of entrepreneurial, regional and financial variables on the performance of innovative small firms in different operational environments. The sample is divided into two groups. One is composed of 71 firms located in the south-east local economic planning region and the other is made up of 99 firms located elsewhere in the United Kingdom.

The results confirm earlier findings that substantial innovations introduced by SMEs over the period 1975–1983 were concentrated in a few sectors of industry. Surviving and innovative SMEs are part of a set of fast-growing firms which warrant the attention they receive from policy makers and academics alike.

At the regional level the evidence suggests that significant innovations are more likely to be introduced into the south-east region than elsewhere in the country. The work also shows that, post-innovation, retained profits and exports grow more strongly in firms located in the south-east than those located in other regions of the UK. Whilst the majority of firms in the other regions were family-run, the south-east firms were, in contrast, run by more professional directors and were more often associated with exports and profitability growth than family-run firms.

In [Chapter 4](#), Jeanine Cohen examines the restructuring and relocation of firms with high levels of research and development in the Greater Paris region. She shows that, from the 1980s, the places with the highest relative levels of employment were located in the west contiguous ‘communes’ of Paris and, more widely, in the peri-urban, south-western and southern areas. Nevertheless, the industries and firms that make up the ‘high-tech’ phenomenon are changing. This is due, at least in part, to the international restructuring of firms. This restructuring is also affecting the traditional industrial zones such as the northern suburbs of the capital.

Modernisation, involving a certain amount of decentralisation, is also associated with acquisitions and job cuts. The aim of this piece of research is to discover whether local milieux, such as *La Cite Scientifique* and other local actors, can counter-balance the trends driven by acquisitions, deregulation and privatisations in such a way as to modify the role of R&D in the Paris region.

In [Chapter 5](#), Heidi Wiig and Michelle Wood report a theoretical and empirical study of a non-metropolitan region as an economic space and innovation system. They present data from a comprehensive survey of innovations among manufacturing firms in the region of More and Romsdal. This is a coastal region in central Norway with a wide mix of mostly small-scale manufacturing activities.

They argue that although there has been a great deal of theoretical and empirical work attempting to explain regional divergences in technological performance and economic growth, there appears to be no systematic approach to the study of innovation systems in a regional context and closer investigation of innovation systems must be conducted at the regional level as well as the comparatively well-documented national level. They go on to say that research should move beyond the study of successful regions, which have been the major focus of studies in industrial geography.

The chapter proceeds by analysing the factors and processes which operate within and beyond the More and Romsdal administrative region in Norway. They map the innovation infrastructure that supports the region’s innovative capacity and look closely at what kinds of networks of local institutions and local firms form the regional innovation system.

In [Part III](#), the strategies adopted by governments for peripheral regions are examined. In [Chapter 6](#), Robert Huggins examines the impact of increased networking awareness upon new models of regional development and competitiveness. This is done with particular regard to technology policy. He investigates the role of networks, both of a human and electronic nature, with respect to SMEs who are often dependent on information provision through external sources. In this context, he examines questions about the effects of networking on regional innovation strategies and the promotion of inter-firm collaboration.

The chapter focuses on the role that institutions such as ‘technopoles’ can play in the industrial regional economy and what their most appropriate

characteristics might be. This is accomplished by a detailed study of a model that is undergoing a feasibility study in Wales by designing a 'network of networks'. This offers opportunities for information exchange at both the regional and global levels. The 'South Wales Technopole' project is a European Union (EU) SPRINT-funded study being undertaken by the Centre for Advanced Studies in the Social Sciences at the University of Wales in collaboration with the Welsh Development Agency.

The Welsh feasibility study is compared with the models of regional development that exist in Denmark and North-Rhine Westphalia. These have based competitiveness and modernisation strategies on innovation support networks and the increased participation of their respective SMEs. These comparisons indicate pointers to successful networking and increased competitiveness in peripheral regions.

In [Chapter 7](#), Andy Pratt offers an account of the changing shape and form of innovation networks and institutions in developed industrial economies. He argues that, to date, this debate has been dominated by discussions of 'grand transitions' from Fordist mass-production to post-Fordist batch production. Associated with this has been a concern with the social and economic contexts that are perceived to be necessary, or sufficient, to support, or promote, economic development. Researchers have highlighted the role of the institutional and network structures within which firms operate. A further dimension of the debate has had an epistemological character implicating either macro-structures (regulation theory) or micro-actors (flexible specialisation) in explanations of the transition process.

This chapter attempts to cut across these debates in a fashion that is sceptical of the explanatory power, and extent of the applicability, of grand transition theories. It accepts that networks and institutions have always been important in industrial development; it is their exact nature, form and effect that are in question.

The chapter argues that the contemporary discussion about networks and institutions ignores the question of power. In order to understand the consequences and effects of different forms of economic arrangements for various actors and collectives, analyses of the relations between power and institutions are clearly required.

[Chapters 8 and 9](#) look at the very significant attempts, inspired by the Ministry of International Trade and Industry (MITI) in Japan, to develop their peripheral regions by means of their 'technopolis' strategy. In [Chapter 8](#), Sang-Chul Park describes the perceived problems confronting the Japanese at the beginning of the 1980s. These included: trade conflicts with their major trading partners, the opening up of their domestic markets and the need for basic research. These challenges were met by MITI with the launch of its 'New Industry Plan' at the beginning of the decade.

The New Industry Plan is made up of six linked strategies. These are: joint R&D projects, strategic alliances with foreign countries, the technopolis plan,

telecommunication networks, venture capital and business, and the promotion of selective imports. Among these strategies, the Technopolis Plan plays a significant role in carrying out the decentralisation of industry and co-ordination between local governments, industries and academics. One of its main aims is to contribute to the future development of peripheral regions. This is to be achieved by dispersing the locations of new applications and combinations of existing technologies, assisting the emergence of new applications and technologies, and preparing for major technological innovations after the 1990s.

Sang-Chul Park focuses on how the Technopolis Plan will affect regional development and how this may be achieved. He also explores how technology transfer and the creation of new employment will take place in the technopolis regions.

In [Chapter 9](#), Rolf Sternberg presents some original information on the effects of the technopolis policy so far. He analyses the economic and technological development of the so-called ‘Silicon Island’ of Kyushu in southern Japan. He investigates the reasons for the growth of high-technology industries in this part of the country, which used to be dominated by primary sector activities until the 1980s. He also analyses the impact of the technopolis programme on the regional development of Kysushu. He uses new data on all 26 technopolis sites to examine whether the technological disparities between the metropolitan core of Tokyo-Osaka-Nagoya and peripheral areas like Kyushu have been diminished as a result of the technopolis programme. The results of this analysis have important implications for European policy makers—such as those involved in French technopole development.

One of the most important requirements for state-of-the-art regional development is the transfer of the relevant and most up-to-date technology from its original sources to firms and institutions located elsewhere. There has been much discussion about how this may be achieved. Often, this debate fails to make the important conceptual distinction between information and knowledge. Among other differences, information may be transmitted electronically while knowledge and active understanding reside in the heads of individuals. The differences and alternative policy strategies that this important distinction lead to are discussed in [Part IV](#).

In [Chapter 10](#), Nic Komninou presents some recent developments in technology transfer theory and policy. He argues in favour of diffused and network strategies of technology transfer.

In some European countries, as in Japan, technopoles have been an important strategy for innovation and technology transfer. They have provided public R&D, start-up finance, consulting, marketing and other services to firms. Nevertheless, after two major waves of technopolitan development in Europe, between 1969 and 1973 and from 1983 to 1993, some major disadvantages in their technology transfer have become apparent. These include their degrees of localisation and the lack of external economic linkages.

After developing these criticisms, Nic Komninos goes on to discuss some recent developments in technology transfer theory and policy. These include the EU SPRINT programme, the new programme for telematic services of the fourth R&D programme, and the Bangemann report on information services and infrastructures. These proposals develop new concepts for innovation and technology. They are characterised by a quasi-activist approach, with emphasis on networking and institutional external economies. Finally, Nic Komninos argues that there is a need for diffused strategies of technology transfer. These would involve institutions and infrastructures for multi- and non-centrally organised networks which create technology transfer links directly among firms.

This discussion leads on to [Chapter 11](#), in which Keith Tanner and David Gibbs examine local authority strategies for providing and using information and communication technologies (ICTs) in local economic development. They outline the nature, diversity and uneven spatial distribution of current strategies that have been adopted by local authorities in Britain. Their analysis is based on the results of a questionnaire survey of some 200 metropolitan, county and district authorities. These represent all regions and both urban and rural areas.

The local initiatives are classified in terms of their overall aims, which provide details of the spatial variation of ICT policies and initiatives in Britain. A number of problem areas are also identified, which hinder the ability of local authorities to develop strategies. These include: lack of finance, unqualified personnel and the absence of national co-ordination.

Further research reveals several policy issues which give cause for concern. In particular, one major criticism is that both prior and *post hoc* evaluations may be inadequate or misdirected. The chapter concludes with an analysis of the ICT policies and initiatives that have developed in the Manchester area, to highlight the policy issues involved.

In [Chapter 12](#), Helen Lawton Smith examines the movement of people from national laboratories in the UK, France and Belgium as a medium for knowledge and technology transfer. She contends that the dynamics of labour markets as the key to economic development are re-emerging as major academic and political themes and quotes the 1993 White Paper *Realising Our Potential* in support of this notion.

Her argument is that it is becoming increasingly apparent that mobility of personnel is a critical issue in the management of research. This is because technology transfer and the movement of scientists and engineers are part of the same process. People transfer involves the relocation of technical knowledge which, while benefiting recipient institutions in particular places directly, also feeds into existing networks of contacts. This is increasingly important because of changing technological imperatives due to first, convergences in technologies such as telecoms, television and computers; and second, the need to combine scientific and engineering knowledge located in other institutions inside and outside national boundaries. In this scenario, efficient networking becomes essential.

The chapter focuses on scientific labour markets in Europe and, in particular, on the contribution made by case study national laboratories in the UK, France and Belgium. National laboratories are defined as those which operate under the aegis of public authorities—even though they may not be directly funded from the public purse. The important feature is that their function is determined by a central or regional government department.

Helen Lawton-Smith argues that the move to commercialisation of public sector science in the UK has two obvious effects: the first is that it is leading to a declining resource base in science and engineering skills in the UK, and the second is that national laboratories in France and Belgium have been much more active in promoting mobility, and in the creation of new networks in which knowledge is transferred, than those in the UK. The consequence of the latter is that this achieves a more flexible, and potentially more successful, approach to innovation which integrates skills from outside and inside domestic economies.

The contributions to this volume identify a number of key issues with respect to innovation and the regional question. The first of these is the need to understand the special roles of core metropolitan regions with respect to national innovation. The evidence shows that on the one hand they tend to be the most innovative geographic concentrations and on the other hand they show few, if any, of the characteristics hypothesised in network and new industrial district theories. They are not the locations of collaborative supply-side networks. More often they contain secretive and competitive firms whose networks are with demand-side export customers. The ability to produce local actions which make them competitive in global markets is an important indication of their innovative success.

The second key issue is that the more peripheral western regions are all interested in overcoming their peripherality by developing local supply-side networks and information technologies. In doing so they may be misunderstanding what makes more central regions successful. One of the key features of the latter is the concentration of highly qualified professional workers. It is mostly such people who learn and innovate. Regions, networks, information technologies and new industrial districts are inanimate objects which, by themselves, can do neither of these two things. Even highly qualified professional workers are limited in their abilities to innovate, without adequate public and private funding. The Japanese technopolis programme aims to bring all these ingredients together in many of the country's more peripheral regions. It is shown that massive, and very long-term, efforts are required to overcome the innovative advantages enjoyed by the central core megalopolis.

The third and final major issue concerns the importance of technology transfer and diffusion and how best to achieve it. An important distinction must be made here between information and knowledge. Much of the evidence shows that policy makers often proceed on the basis that information transfer by technological means is sufficient to bring about significant technology transfer. This is seldom the case. Knowledge contained in highly qualified professional

workers' heads is an essential ingredient of real technology transfer. Thus attempts to generate spin-offs by encouraging staff to move out of government funded research establishments may be a better example of real technology transfer.

PART II

Core Metropolitan Regions

CHAPTER 2

The Origins and Characteristics of Innovation in Highly Innovative Areas The Case of Hertfordshire

James Simmie

Introduction

This chapter rehearses some of the basic theoretical positions which inform the analyses to come. These start with economic arguments based on the insights provided by Joseph Schumpeter. This is followed by a discussion of the critical issue of globalisation. This is argued to be both a major post-war development and a significant issue for local economies.

The counter arguments concerning the importance of localities for innovation are also reviewed. These include both the ideas of flexible specialisation and new Marshallian industrial districts. Both these ideas are argued to be place-specific and limited to industrial sectors which are seeking to extend old product life-cycles.

The role of localities with respect to innovation is argued to be more akin to the key conditions identified by Porter (1990) in connection with the competitiveness of nation states. Thus, local economies are argued to be facing both inwards, in developing their own innovative capacities, and outwards, to compete in global markets. Innovative products are said to be an essential feature of international competitiveness. In these circumstances, local economies and their firms are said to operate at the global/local interface.

Award-winning innovations in Hertfordshire, one of the UK's most high-tech counties, are used to explore these hypotheses in more detail. Some preliminary findings of an empirical survey are presented. These suggest that innovation in core metropolitan areas is a more chaotic activity than some of the available theories suggest. There is not much evidence of either systematic networking or high-level linkages contributing to the award winning innovations. Government regulations do not appear to contribute to innovation. Thus, theories that include

The author would like to acknowledge the support of the ESRC grant number R000221536 for this study.

networking, local industrial organisation or regulatory regimes do not appear to fit the Hertfordshire case.

The New Space Economy

Schumpeterian Economics and the Role of Space

The role of space in most Schumpeterian economics is incidental to the major concern with innovation and technological development. Nevertheless, some Schumpeterian analyses do have significant spatial implications. Practical innovations and technological developments take place somewhere and not in a placeless vacuum. The alternative considerations raised by the Schumpeter 1 and 2 models, with respect to the roles of small and large firms in innovation, have given rise to a series of simplified dualisms in subsequent analyses, which are often tied to alternative spatial scenarios. These have been summarised by Gordon (1991).

Many of these contrasting dualisms reflect the Schumpeterian belief that we are living in times of change. The 1980s and 1990s could be the the depression phase of the fourth Kondratieff long wave and the 2000s the beginning of the recovery of the next wave. As such, history may eventually show our experiences to have been those of moving from one epoch to another.

Although it is difficult to perceive exactly what will emerge as the major characteristics of the next epoch, many of the posited alternatives are concerned both with the organisational forms and the spatial arrangements of innovations and high-technology as they drive contemporary change. They include: pervasive concerns with the relative roles of large multinational corporations as compared with smaller firms and the causes of spatial agglomeration of innovative economic activities.

One side of the argument represented, for example, by Froebel, Heinrichs and Kreye (1980), Henderson and Castells (1987), Amin and Robins (1991) and Thrift (1989) is that a global economy has developed which is dominated by large multinational corporations (MNCs). The decisions of these MNCs, on where they conduct such activities as R&D and production, determine to a large extent what economic activities agglomerate in particular places.

The other side of the argument represented by Piore and Sabel (1984), Porter (1990), Lundvall (1992) and the new Marshallians—such as Scott and Storper (1987), Storper and Christopherson (1987)—is that local places are becoming more, not less, important in their contribution to innovation and high-technology. The focus of consequent research is quite different, according to which side of this global/local divide is taken. The main propositions of the two views are outlined briefly below.

Globalisation

There can be little doubt that capital is concentrating and centralising at the level of the international economy. The corporate vehicles for this concentration are the multinational corporations (MNCs) with control centralised in their respective headquarters, which are often located in and around world cities—such as London, Tokyo and New York.

There is plenty of data which confirms the significance of MNCs as major shapers of the world economy. Even by 1980, for example, only 350 of the largest of them controlled economic resources which were equivalent to more than a quarter of the combined Gross Domestic Products (GDPs) of all the developed and less-developed countries put together. Somewhere between 25% and 40% of all world trade consists of purely internal transfers between the subsidiaries of MNCs (Sutcliffe 1984). High-technology firms are also some of the major players in the global economy. Characteristically they have low levels of forward linkages. This tends to confirm the findings of several researchers: that high technology firms operate in global markets.

The argument developed following these kinds of data is that localities, regions and even national territories are being re-shaped according to the global economy and its main players the MNCs. Following this formulation, there is a spatial division of labour and a spatial division of innovation. The large enterprise is able to split its activities into units and to localise and disperse these units in the most favourable places in terms of work and industrial culture (Massey 1984; Aydalot 1979). Regions at the nodes of the global network have a large autonomy. The further they lie from this central node, the more regions are locked into the international division of labour and resemble the old Fordist branch centres (Amin and Robins 1990a).

These views lead to trenchant criticism of the argument that regions and localities are growing, rather than declining, in independence and importance in the contemporary innovative and high-technology era. It is argued, for example, that MNCs, with their global networks, have far more impact on the world economy than locally-embedded firms. Therefore, to an MNC, flexibility is a matter of industrial organisation on a global rather than a local scale. As far as they are concerned, the issue is not how to increase local area autonomy but how to create more efficient corporate integration. This makes industrial geography a series of maps of places with different roles in the international division of labour. As a result, local places experience different degrees of economic well-being and local production synergies (Amin 1991; Amin and Robins 1990b; Praat 1991).

The main problem with this argument is that places are assumed to be homogenous. Although they may be grouped into different categories such as centre and periphery, it is assumed that these are so similar as to make MNCs entirely indifferent as to which of the appropriate categories of space they allocate their appropriately divided labour. It is, therefore, assumed that a high-

technology MNC like IBM is indifferent in its choice of location of R&D as between places like New Jersey, Dortmund or Sidney; or of production of personal computers as between Sonoma, Taiwan or even Patagonia. In practice this is clearly not the case. Differences between localities within and between different categories of place are significant and do matter. This appears to be true, even within the acknowledged context of the globalisation of the world economy.

The questions that still need to be answered are, therefore, given the globalisation of the world economy, why does location still matter? And what are the characteristics that distinguish 'successful' innovative and high-technology areas from those that are not? Two of the best-known 1980s answers to these questions are examined below.

Flexible Specialisation and Marshallian Industrial Districts

One of the most influential analyses in the 1980s of why place could still matter with respect to innovative industries is the idea of flexible specialisation pioneered in the seminal work by Piore and Sabel (1984) *The Second Industrial Divide*. In it they argue that the widespread beliefs that firms are independent entities, and that small firms are linked in competitive markets whereas large firms are organised as oligopolistic hierarchies constituting entire industries, are neither an exhaustive nor accurate description of current configurations. They further argued that firms, particularly those organised in industry-embracing hierarchies, are saturating markets with traditional, standardised, mass-produced goods. As a result, consumers are demanding more specialised and differentiated goods—which mass-production systems, typically, cannot supply. The response of some firms to these changed circumstances is argued to be the development of flexible specialisation. This is a strategy of permanent innovation: firms accommodate ceaseless change, rather than try to control it. The strategy is based on flexible, multi-use equipment, skilled workers and the creation, through politics, of an industrial community that restricts the forms of competition to those favouring innovation. It is also argued that the spread of flexible specialisation amounts to a revival of craft forms of production that were marginalised during the first industrial divide, which is usually referred to as the industrial revolution.

Piore and Sabel (1984) also argue that the spread of flexible specialisation represents such a major and pervasive change that it constitutes a shift of technological paradigm. They cite examples of the re-invigoration of craft-based industries in Italy, Germany and Japan in support of the pervasiveness of what they argue to be a new paradigm. Areas based on small, craft firms in places like central and north-western Italy, Mondragon in the Basque Region of Spain (Stohr 1986) and the high fashion areas of Paris (Storper 1993) have been studied intensively to illustrate the main characteristics of flexible specialisation.

There are five major problems with the flexible specialisation thesis in its original formulation:

1. Far from indicating a new, emerging paradigm for the industries of the fifth long wave, the examples cited usually refer to old industries surviving from previous times. Many of these industries have reached the latter stages of their product life-cycles and are mostly attempting to extend them into artificially differentiated niche markets in order to survive. Designer ceramic tiles from Italy and high-fashion from France are not the industries of a new techno-economic paradigm of the future. They also suffer from the problem that much of their niche market value is derived from such intangible assets as designer names. The products themselves can often be copied and sold for less.
2. There is not much evidence that the industries of the next innovative technological trajectory will be in any way craft-based. Dosi *et al.* (1988, p. 52) suggest that they will be some combination of computers, electronic capital goods, software, telecommunications equipment, optical fibres, robotics, flexible manufacturing systems (FMS), ceramics (not tiles), data banks, information services, digital communications networks and satellites. It is hard to see how any of these industries could be organised on a craft basis and restricted to particular geographic areas.
3. The flexible specialisation theory ignores the growing globalisation of the world economy. Far from a general increase in the importance of local groups of small firms, many writers have argued that what we are witnessing is a deepening of the historical trends towards global integration of local and national economies and the international centralisation of command and control. The dominant, though not uncontested, tendency is towards market homogenisation, industry globalisation and firm integration (e.g. Doz 1987).
4. Where they actually exist, the networks that are so important to the flexible specialisation thesis really indicate a deepening and extension of the structure of oligopolistic behaviour and control. What is at work is not fragmentation, decentralisation and increasing organisational autonomy, but more effective corporate integration across vertical, horizontal and territorial boundaries (Amin and Robins 1991).
5. There do not appear to be many true examples of flexible specialisation in practice. While craft communities are to be found in the Third Italy, some of the other frequently cited examples of the genre, on closer examination, do not seem to support the thesis. Silicon Valley in California, Route 128 around Boston and Silicon Glen in Scotland, for example, are not only all significantly different from one another, but also display very few of the characteristics of flexible specialisation.

Despite these criticisms the idea of flexible specialisation has been combined with that of Marshallian industrial districts in order to seek to 'explain' the undoubted emergence of innovative, high-technology agglomerations in certain places. This spatially-focused analysis is examined next.

Marshallian Districts

The idea and characteristics of spatially concentrated industries is associated with the economist Alfred Marshall. He coined the phrase 'industrial district' in 1890 to describe such areas. He subsequently developed the idea that 'The leadership in a special industry, which a district derives from an industrial *atmosphere* (emphasis added), such as that of Sheffield or Solingen, has shown more vitality than might have seemed probable in view of the incessant changes of technique. It is to be remembered that a man can generally pass easily from one machine to another, but that the manual handling of a material often requires a fine skill that is not easily acquired in the middle age: for that is characteristic of a special industrial atmosphere. Yet history shows that a strong centre of specialised industry often attracts much new shrewd energy to supplement that of native origin, and is thus able to expand and maintain its lead' (Marshall 1919, p.287).

The idea was taken up and re-invigorated by Becattini (1990). Studies, originally inspired by the idea of flexible specialisation in fast-growing industries such as textiles, footwear and ceramic tiles in the Third Italy, claimed to have rediscovered industrial districts in the areas specialising in these industries. It has also been argued that some high-tech industrial complexes in California operate as industrial districts (Saxenian 1991; Scott 1993).

Critics of the concept of Marshallian industrial districts point to the rarity of some of their claimed characteristics in modern economies. Thus, local allegiance, co-operation, trust relations and social and institutional solidarity are hard to find. At any rate, they do not appear to be common in high-technology clusters in the US. If anything, they have become increasingly rare in the developed economies and are difficult to nurture in places where they do not already exist.

Analyses of industrial districts tend to ignore the significance and effects of the global economy as far as different areas are concerned. Attention is focused on the internal social, political and institutional characteristics of areas identified as industrial districts. As a result, there is a tendency to treat them as industrial islands as much as districts. But, as Storper (1993) remarks, the main characteristics of technology districts should be seen in the context of the principal trends in the international economy. They are national industrial areas of specialisation based on often unstable technologies which are being urged to combine and become even more unstable by the constant development of scientific research and markets.

Although some areas can be readily distinguished as potential neo-Marshallian industrial districts, they can also be seen to embrace a wide variety of forms and characteristics. There is little in the way of explanation in the industrial district concept of why such areas arise in the first place, the variety of types that emerge, and what are the functional relationships between industrial imperatives and spatial form.

While on the one hand it is descriptively and empirically the case that something like industrial districts can be identified on the ground, on the other hand the recent redevelopment of neo-Marshallian thought on the subject has not offered much in the way of satisfactory explanation of their existence, variety, characteristics, and potential links between industrial decisions and spatial results. So, while it is easy to agree that innovative, high-technology agglomerations can be found in many countries, it is not so easy to explain why.

In order to advance such an explanation, it is argued here that it is productive to start with the insights provided by Porter (1990) in *The Competitive Advantage of Nations*.

Nation States and Local States

In his influential book, Porter argues that

'Competitive advantage is created and sustained through a highly localized process. Differences in national economic structures, values, cultures, institutions, and histories contribute profoundly to competitive success. The role of the home nation seems to be as strong as ever. While globalization of competition might appear to make the nation less important, instead it seems to make it more so. With fewer impediments to trade to shelter uncompetitive firms and industries, the home nation takes on growing significance because it is the source of the skills and technology that underpin competitive advantage'.(p.19)

While it is clearly true that the economic autonomy of nation states is constrained by the actions of MNCs, nations continue to play significant roles in the conditions under which MNCs operate. Political boundaries create one of the most important ways in which location specific factors are packaged (Thrift 1989, p. 149). They create discontinuities in conditions of supply and demand. Governments can help both to create and destroy the competitive advantages of the firms or elements of MNCs which operate within their boundaries. According to Thrift, such national differences could be the single most important factor in creating global shifts in economic activity.

Porter (1990) identifies four major characteristics which differentiate between national and regional politico-administrative places:

1. Factor conditions.
2. Demand conditions.
3. Related and supporting industries.
4. Firm strategy, structure and rivalry.

Each of these can be influenced in various ways by the political units in whose particular territories firms, or parts of firms, seek to operate. While most of them

cannot escape international competition in the global economy, the politically created conditions under which they operate can make a significant difference to their success or failure.

Porter also argues that there is an association between vigorous domestic or regional rivalry, in technological terms, and the creation and persistence of competitive advantage in an industry. The local operating environment of firms can play an important role in, for example, the diffusion of new product and process technologies. Geographic concentration, even of rival firms, enhances the benefits of strong competition. This is because it:

- stimulates a fast diffusion of new technologies
- helps upgrading suppliers through competition and intensive co-operation with customers on R&D
- puts pressure on political support in creating specialised factors such as specific training and research centres
- stimulates firms to fund local training and research centres themselves.

The main thrust of these arguments is that, even in the context of the global economy, space does matter because it is divided up into political trading blocks and nation states. These political entities can, and do, make significant differences to the local economic environment in which firms have to operate. These differences are so significant as to have major impacts on the processes of economic globalisation themselves, the competitive success or failure of firms and of entire nation states.

These arguments have been taken further to apply not just to whole nation states but also to smaller political entities within them. Politically distinct locations, such as regions or even sub-regions, can influence the competitive conditions under which firms operate. In so doing, they also effect the competitive success or failure of the local state as a whole.

Porter's work, therefore, leads to interesting research questions about what local, politically-created conditions contribute to the international competitive success of firms in the area. It links the globalisation of the economy with the local conditions which make firms competitive in the international arena. In this analysis it focuses attention on what national and local states can do with respect to factor conditions, demand conditions, related and supporting industries, and firm strategy, structure and rivalry in order to contribute to the international competitiveness of locally operating firms. These relationships form, what is called here, the global/local interface.

The Global/Local Interface: An Explanatory Framework

So far it has been argued that innovation is an important element determining the national and international competitive performance of firms. It has also been argued that the external relationships of firms both with their local production