

**REGIONAL INNOVATION AND INDUSTRIAL
POLICIES AND STRATEGIES -
A SELECTIVE COMPARATIVE EUROPEAN
STUDY**

By

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I hereby certify that this material which I now submit for assessment on the programme of study leading to the award of M.B.S. is entirely my own work and has not been taken from the work of others save and to the extent that such work has been cited and acknowledged within the text of my work.

Signed : Patricia Ooherty

Date : 6th October 1998

To the memory of
Edith

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Abstract

The policy concept of Regional Systems of Innovation has emerged in response to the growing recognition of the role that regions can play in economic development. To date, little, if any, attention has been given to this concept in Irish industrial policy documents and this study aims to place Regional Systems of Innovation within an Irish context.

As a comparative study, it explores this concept of Regional Systems of Innovation in relation to the Mid-West region of Ireland and Ringkjobing county in West Jutland, Denmark. It begins with an extensive review of existing literature on innovation theory and practice, and on industrial policies with particular reference to Ireland. It examines past and present Irish innovation and technology policies within the larger context of the Irish National System of Innovation. The study then narrows to focus solely on regional innovation theory and the components of a Regional System of Innovation are constructed.

The primary research phase involved in-depth interviews with key players in each region, selected on the basis of their specialist knowledge. An identification of the need for, existence and strength of Regional Systems of Innovation in the respective regions is sought. Findings suggest that the need for such systems exists. It can be found in Ringkjobing county, despite its failure to commit fully to the process of regional co-operation. In the Mid-West region, however, many crucial elements of the system are weak or even non-existent. These include, the weak state of the Irish local Government system, the neglect of traditional industries, a weak technical orientation and the culture of dependency and clientelism which prevails. Finally, from these findings a potential future direction for Irish industrial policy is indicated.

List of Abbreviations

AMT	Advanced Manufacturing Technology
BERD	Business Expenditure on Research and Development
CEB	County Enterprise Board
CSF	Community Support Framework
DIT	Dublin Institute of Technology
DTI	Danish Technological Institute
EIC	European Information Centre
EIU	Economist Intelligence Unit
EMU	European Monetary Union
ESRI	Economic and Social Research Institute
EU	European Union
EUNIP	European Network on Industrial Policy
FÁS	the National Training and Employment Authority
FDI	Foreign Direct Investment
GAA	Gaelic Athletic Association
GDP	Gross Domestic Product
GNP	Gross National Product
HI	Herning-Ikast
IBEC	Irish Business Employers Confederation
IDA	Industrial Development Agency
IRSA	Irish Research Scientists Association
LA	Local Authority
MNC's	Multi-National Corporations
NESC	National Economic and Social Council
NSI	National System of Innovation
NUTS	Nomenclature of Territorial Statistical Units
OECD	Organisation for Economic Co-operation and Development
PATS	Programmes in Advanced Technology
R&D	Research and Development

RIA	Royal Irish Academy
RIS	Regional Innovation Strategy
RITTS	Regional Innovation and Technology Transfer Strategy
RSI	Regional System of Innovation
RTC	Regional Technical College
RTD	Research and Technological Development
SFADCo	Shannon Development
SME's	Small and Medium Enterprises
SRIS	Shannon Regional Innovation Strategy
STI	Science, Technology and Innovation
STIAC	Science, Technology and Innovation Advisory Council
TIC	Technological Information Centre
TNC's	Trans-National Corporations
UL	University of Limerick
VEC	Vocational Education Committee

CHAPTER ONE
INTRODUCTION

1.0 THE THESIS SETTING

We live in an era of major global technological and structural change. At the same time, the industrial world since the 1970's has experienced its longest recession this century. There is concern at the falling rate of new business formation and at the weakening in the culture of entrepreneurship which drives such business formation. Policy makers throughout Europe are accepting that centrally directed policies and plans have not been achieving the desired aim of sustainable economic growth and development. New approaches are called for and many European models over the last twenty years have responded through the devolution of power and functions to the regional level.

In conjunction with these happenings innovation has become one of the most talked about phenomena. Various definitions have been proposed, numerous debates have been conducted over the conditions necessary for innovation to occur while more recently models have been constructed of the system of innovation at both national and regional level. Why some regions are more innovative than others, which particular climate is conducive to continuous innovation and how can innovation be encouraged and developed in a particular region are just some of the questions frequently asked.

Ireland is a more recent participant in such dialogue and policy initiatives, in particular, through EU programmes and initiatives. As yet, Ireland has moved only tentatively towards the policy concept of National Systems of Innovation and regional innovation and its systemic form is rarely mentioned in current Irish industrial literature. Indeed the lack of entrepreneurship and innovation in Ireland may be, to a large extent, explained through references to its history as a colonised state and its peripheral locality. Whether true or not, this discussion does not lie within the bounds of this thesis which instead will look more so at the culture of the people and attempt to show that the regions hold the key to future sustainable development. Concentrating on the causes of the current situation will not achieve an increase in new firm start-ups. An understanding of the innovation process is however essential, in order to understand the current situation and in turn develop policies and strategies to suit particular regional needs.

It is thus from this perspective that the thesis emerges.

1.1 AIMS OF THE THESIS

To date little research has been undertaken in relation to Regional Systems of Innovation. In light of this and due to the increasing importance that is being placed on the regions and the role which they can play in economic development this study was undertaken.

The study deals exclusively with manufacturing industry and in particular with indigenous manufacturing industry in Ireland. It is comparative in nature and examines the Mid-West region in Ireland and Ringkjobing County in West Jutland in relation to the policy concept of a Regional System of Innovation. The Mid-West region in Ireland was selected due to the existence of Shannon Development, the only regional development agency in the country, and because of the region's history of innovativeness and entrepreneurship. It was felt that if a Regional System of Innovation was actually in place in Ireland that it would exist here, more so than in other regions. Denmark was selected due to its similarities with Ireland, that is, its similar physical and population size, its strong agricultural base and its proliferation of traditional industries. In turn, Ringkjobing County was chosen due to the recognition internationally of the successful industrial districts located in the region.

A thorough assessment of national industrial policies in both countries and their subsequent effect on the respective regions is undertaken. The study also analyses the institutional setting and educational and training systems in which such policies operate.

The study aims to;

1. Identify the factors and conditions necessary to create a climate conducive to sustainable indigenous development. This will be demonstrated diagrammatically through the construction of the components of a Regional System of Innovation.
2. Determine, based on these criteria, the actual need for, existence and strength of Regional Systems of Innovation in the Mid-West region and in Ringkjobing County.

Based on these findings the study will aim to identify areas in need of improvement within the particular regional settings and most importantly to highlight the lessons that can be learnt from the different institutional structures.

3. Indicate a potential future direction for Irish industrial policy.

The thesis aims to assess recent theoretical literature on Regional Systems of Innovation and its application to industrial policy in two particular regions in Europe. It aims to integrate successfully theory and practice in order to develop a System of Innovation which will be beneficial to both policy makers and industrialists in their attempts to achieve sustainable net new economic activities.

1.2 METHODOLOGY EMPLOYED

In order to meet the aims stated above the study required an extensive review of current literature relating to regional innovation theory, Irish and Danish industrial policies and their respective institutional structures. This was complemented by extensive primary research in the form of field studies in the selected regions to gain a deeper knowledge and understanding of the systems of innovation which are in place.

1.2.1 Secondary Research

Secondary research involves the exploration and collection of published, or available but unpublished, information that relates to the field of study, essential for the successful completion of a thesis.

Throughout the course of the preparation of this thesis an extensive literature review was undertaken. Information was obtained from an array of sources and included, books, periodicals, EU, Irish and Danish government publications, newspapers, reports and the internet. It necessitated not only the use of the college library and other libraries situated in Dublin, but required further search for vital data in Copenhagen and Herning central libraries. Another source of external secondary information presented itself in the form of conferences and seminars which were attended over the period of the study.

These included; Innovation in Practice - Regional Innovation Network Launch, Dublin, on the 26th of April 1996, Citizens' Europe Towards 2000 - The Irish Presidency and Inter-Governmental Conference, Dublin, on the 26th/27th of September 1996, Shaping Our Regions : Subsidiarity, Innovation and Economic Development, Regional Studies Association Irish Branch National Conference, Dublin, on the 5th of November 1996, and the EUNIP International Conference on Industrial Policy for Europe, London, on the 26th/27th of June 1997.

1.2.2 Primary Research

Primary research is defined by Koschnick (1996, P.286) as;

That part of social and market research activities consisting of the application of methods and techniques to collect all data required within the context of an investigation, be it by means of field research or laboratory research.

For this study field research was the obvious choice due to the need to investigate current structures and relationships in the regions themselves. While primary data can be obtained in a variety of ways the interview and questionnaire methods constitute the two main avenues that can be taken. The purpose of field research, particular to this study, was to elicit expert opinions, experience and knowledge and the interview technique therefore proved to be the desired and most suitable approach.

The study, through the field research, aims to gain a broader insight into the two regions on which hypotheses may be developed. Thus this study is highly qualitative in nature. It wishes to understand the social interactions within the setting and draw from their experiences in order to uncover the factors which contribute to, or hamper innovation. Qualitative research typically involves small sample sizes and non-structured questions (Koschnick, 1996). Koschnick (1996, P.294) continues that qualitative research "usually consists of questioning knowledgeable respondents individually or in small groups".

The Sample

For the purpose of the thesis quota sampling was adopted due to the need to interview key players who were involved and interested in industrial policy and who represented the public, private and education sectors. Those interviewed were selected based on these categories and prior knowledge, and were acquired through the help of “key actors” (Bailey, 1996) in both regions. It is important to note that these ‘key actors’ helped gain entry to the regions but did not attempt to guide the selection of participants or direct attention towards any particular issue. As well as the use of the key actors some introductory letters were required to explain the reason for the field study more fully to the potential interviewees than was possible through a telephone conversation (see Appendix A). This representative sample from both regions was selected due to their specialist knowledge and close involvement with manufacturing industry. It thus includes key figures from the local and regional industrial development bodies, local colleges and training centres, industry representative organisations and the industrialists themselves. As Kane (1983, P.93) states;

Whether the quotas are based upon a single characteristic or on more, the selection of members of the sample is not done randomly. Instead, the researcher just finds enough people in each of the important categories.

The field trips included a preliminary day trip to the National Technological Park in the Mid-West region, two weeks in Denmark, with one week spent in Copenhagen Business School and the other in Ringkjobing County, and a subsequent seven days in the Mid-West region (see Appendix A).

Semi-Structured Interviews

Due to the depth and scope of the research topic it was necessary to have set areas which would be covered in each interview, while also allowing for additional questions as they arose throughout the course of the interview, or even questions which may have arisen from a previous interview. A more formal type of interview would certainly have ensured that all the essential areas were covered and would have made the analysis of findings much simpler. However, as Miller (1983, P.16) states;

Pre-specified questions ensure that desired topics are covered, but at the cost of preventing a natural evolution of conversation and thought.

Therefore, a more informal method of interviewing would be able to “dig deeper” and gain a fuller understanding (Moser & Kalton, 1971) of the issues at hand. Similarly Rudestam and Newton (1992, P.38) note how “research questions in qualitative research can be revised or reformulated as the study proceeds”.

Consequently, the study utilised an in-depth semi-structured interview design to assess the need for, and subsequently the existence of Regional Systems of Innovation. The interviewee was guided around a number of key issues which could be related to the individuals particular field of scope. In general, sections one, two and four of the semi-structured interview were largely similar while section three dealt specifically with the position and scope of knowledge of the interviewee. Appendix B presents examples of the types of questions asked. Not all questions were necessarily asked during a particular interview, just as some specific questions may have arisen during the course of a interview. The research questions, as can be seen from Appendix B, were revised slightly following the field trip to Ringkjöbing County, although remaining very similar with regard to the areas covered. In contrast, the type of questions asked during the research of two specific programmes in the Mid-West region, namely the Programmes in Advanced Technology and the Techstart Programme, were very different and related exclusively to their review (see Appendix B).

The interviews, on average, lasted over one hour and the question of whether a tape recorder should be used arose. For this study local public bodies were being asked their view of other organisations in their area and similarly industrialists were being asked to comment on the effectiveness of such public bodies. Thus due to the sensitivity of the subject matter the risk that the tape recorder would lower the response rate to particular questions was too great (Moser & Kalton, 1971) and the interviews were manually recorded. When it was deemed necessary interviews were followed up with further telephone interviews in order to clarify particular issues.

1.2.3 Analysis of Qualitative Research

...qualitative data are usually reduced to themes or categories and evaluated subjectively. There is more emphasis on description and discovery and less emphasis on hypothesis testing and verification (Rudestam & Newton, 1992, P.31).

In comparison to quantitative research techniques, qualitative research findings are regarded as lacking precision and seemingly subjective (Koschnick, 1996). While it proved necessary to be subjective in the selection of the sample, considerable effort was made to ensure that the interviews were treated objectively and that different responses to a particular question were examined in their totality along with relevant literature to ensure that conclusions were not directed by particular answers or personal opinions. However, while objectivity was sought at all times it is accepted that precision relates only to this particular research of the two regions, despite the belief that it presents an accurate picture of their present structure and policies. Finally it is acknowledged that a personal interpretation of the findings does occur, but it is an interpretation which has been based not only on the interviews undertaken, but also on the extensive literature available and the numerous discussions which took place with academics in both Ireland and Denmark.

1.2.4 Limitations of the Study

It is essential to the validity of any study that limitations experienced during the research are acknowledged. Time and cost constraints are the most frequently encountered limitations in field research and both played their part in this thesis. Time and cost factors permitted the evaluation of only two European regions and undoubtedly a further case study would have expanded both observations and learning and could have contributed to final policy proposals.

The distance from the Danish region, and the cost of getting there, did not permit preliminary or re-visits as occurred in the Mid-West region of Ireland which was visited four times throughout the course of the research. Also, the review of Danish literature

was limited to those published in English which omitted many industrial documents written by local academics in this field of research.

Finally many evaluations of programmes and organisations in Ireland remain internal and confidential, thus excluding the researcher from information that could have proved highly beneficial to the development of the thesis.

1.3 THESIS STRUCTURE AND CONTENT

This introductory chapter describes the setting from which the thesis has emerged, the overall aims of the thesis and the reasons for the methodology employed.

Chapter Two examines the literature on current European regional policy and thinking looking at, among other things, the importance of small and medium sized enterprises, the role of government, and innovation in theory and in practice.

Chapter Three first addresses the new found interest in National Systems of Innovation and questions whether the national level is the most appropriate level at which to analyse, measure and stimulate innovation. This is followed by an in-depth analysis of the Irish National System of Innovation.

Chapter Four looks in detail at the concept of Regional Systems of Innovation. The need and practicality of such a system in Ireland is evaluated and weakness in the present administrative system is discussed. The chapter concludes with the development of a Regional System of Innovation illustrating its essential elements and conditions.

Chapter Five examines the Danish National System of Innovation as the starting point from which a full and comprehensive evaluation of the system of innovation in Ringkjobing County is undertaken, through the use of semi-structured interviews. It incorporates not only industrial policy put also deals with the whole institutional set up in the region.

Chapter Six similarly examines, through the use of semi-structured interviews, the system of innovation currently in existence in the Mid-West region, assessing whether the public, private and education sectors are working towards a coherent regional strategy.

Finally, Chapter Seven presents the evaluations and conclusions derived from the above research, determining the existence and strength of Regional Systems of Innovation in Ringkjobing County and in the Mid-West region and presenting conclusions on the direction future industrial policy in Ireland should take.

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CHAPTER TWO
LITERATURE REVIEW

2.0 INTRODUCTION

In recent decades technical change has concentrated on cost reduction and rationalisation with a failure to focus on the creation of new products (Sweeney, 1995a). With the West still attempting to compete on price it has witnessed the fall of its manufacturing industries, the depression of its craft skills and originality through the continued use of mass production, the increasing polarisation between rich and poor, the unacceptable level of unemployment in Western Europe (Hingel, 1993), and the loss of its learning efficiency. The last twenty years has witnessed the rise of Japan as a major economic and technological power and more recently the emergence of the Newly Industrialised Countries. Consequently, in an attempt to maintain global competitiveness many developed countries have sought cheaper production centres as a cost-cutting measure.

The manufacturing era took form out of the Industrial Revolution of the late 18th century and held dominance up to the early 1970's. Within this cycle, described as a secular cycle, shorter, approximately half a century, Kondratiev cycles could be identified. They represented major innovations, transforming technologies which progressed from the steam engine, to the steel industry and more recently the chemicals industry.

Micro-electronics as the last major innovation in the 1970's initiated the new Kondratiev cycle. Information technology subsequently emerged and, arriving at the end of both a previous Kondratiev cycle, i.e. the chemicals industry, and a secular cycle, i.e. the manufacturing economy, its role was to stimulate a new secular cycle, that of the information economy. However, it appears that the potential of the information economy is not being fully realised due to the remaining dominance of the previous cycle. As Sweeney (1995, P.2-1) states;

The manufacturing economy was driven by organisational innovations directed to the achievement of economies of scale but the diseconomies which have been generated and the momentum of organisational and scientific determinisms characteristic of the manufacturing economy are delaying the emergence of the information economy.

The information economy is universally accepted as describing the emerging secular cycle. Society has become more information intensive and knowledge has become the most fundamental resource, with learning as the most important element of this process (Lundvall, 1995). An abundance of information is of little use if it cannot be interpreted, broken down and used in a new format. Only this will ensure the creation of new economic activities which will hold the key to self-generated economic development.

Regional cycles can be identified within secular and Kondratiev cycles and are, as such, the driving force behind them. Regions such as Emilia-Romagna in Italy and Baden-Wurttemberg in Germany, for example, have emerged and prospered when the nations themselves were in recession leading to the conclusion that innovation, entrepreneurial dynamism and economic development and prosperity are local phenomena (Sweeney, 1995). Entire nations are not economically prosperous, but rather particular regions have achieved economic success.

In the midst of all the policy and technological changes one point remains clear. New economic activities are born out of innovation and its potential in a region. Innovation is interpreted rather broadly by Nelson and Rosenberg (1993, P.4);

..to encompass the process by which firms master and get into practice product designs and manufacturing processes that are new to them, if not to the universe or even to the nation.

Similarly Piatier (1981, P.20) remarks how;

..it is often believed that innovation can only be technological. This is not so. It can also be absolute (a world first) or relative (the first time something already done elsewhere is done in a given country).

Innovation is thus an on-going process of continual learning, it is gradual and cumulative (Lundvall, 1995). One learns not only by doing, but also by using and by interacting. Lundvall (1995) regards learning as predominately an interactive process and thus socially embedded in the institutional structure of a region. Innovation, is concerned with learning where new information is absorbed, shared and adopted into the existing

culture and thus, continuous learning is the essence of a sustainable innovation system. A successful economy depends not only on the ability to produce knowledge, but also on its ability to use it.

It is therefore the contention of this thesis that the potential of a region to innovate will be affected by the local culture and the whole institutional structure of the region. The influences are therefore many and varied and thus, the analysis of innovation must be approached systemically accepting that there is not one thing but a combination of many factors which will allow a region to develop indigenously and to generate its own prosperity.

Porter (1990, P.73) states how “a nation’s competitiveness depends on the capacity of its industry to innovate and upgrade”. To achieve this the “short termism” ideology of the mass production era must be superceded, creating an interdependence between all elements in the environment. An environment built on shared values, internal cohesion and mutual trust will pave the way for future sustainable development. The core competencies of a region must be focused in the direction of change and progress, although often hard to identify (Utterback, 1994). This review therefore commences by stating that economic development is a local phenomenon, that innovation is central to the creation of net new economic activities and, that it is a social and cultural process just as much as a technological one. By examining the various factors it will be shown that there is “no optimal model to innovate successfully, but a plurality of organisation systems” (Fast, 1991, P.10), and that diversity and receptivity to external technological changes will hold the key to sustainable economic development.

2.1 REGIONAL DISPARITIES

Regional disparities arise when regions differ in relation to levels of income, employment and general economic activity. This unevenness in the levels of economic welfare and growth, the fact that all areas are not homogenous, stimulates interest and has led to much research into the factors responsible for these disparities. Disparities have always been regarded as inevitable, resulting from nature given advantages that left some

regions more endowed than others. To this belief is now added that differences in wealth derive from differences in culture, climate and history and, now even more importantly "the capacity [of regions] to adapt to the rapidly changing world of the late twentieth century" (EC, 1994, P.10). Despite this, regional dominance in Europe has remained largely centred for centuries in what are described as islands of innovation.

2.1.1 Islands of Innovation

The old industrial heartland of Europe stretches from the south of England to the north of Italy. This core consists of ten major islands of innovation - south-east England, Rotterdam/Amsterdam, Paris/Ile de France, Rhein-Rhur area, Frankfurt, Stuttgart, Munchen, Lyon/Grenoble, Turin and Milan. Hingel (1992/93, P.48) defines these islands of innovation as;

...a locality where high technological and industrial capability and scientific excellence are concentrated and where these firms and research institutions often form innovation oriented networks.

This however, presents a narrow picture, focusing on the high-tech. It ignores the endogenous development that is taking place in many regions throughout Europe. Emilia-Romagna, for example, on the basis of GNP per capita is in the top group of regions in Europe (Keane, 1995) and must act as a role model for peripheral regions. It also ignores the fact that traditional industries are not obsolete in this time of high-technology, as can be seen through the success of the textile industry in Denmark, but rather that obsolete methods are often being used.

New trends are taking place in the European concentration model where in addition to the original northern development pole or the 'blue banana', a development pole has emerged in the south termed the 'croissant' spreading from Catalonia in the west to northern Italy in the east. The dominance of the core, therefore, appears to be continuing drawing the highest benefits from European integration. However, despite the emergence of new regions, Von Gleich (1995, P.2-45) observes that London, Milan, Paris, etc., remain as growth centres and;

Thus besides the regionalisation and decentralisation trends, there is also an unbroken tendency to further centralisation, out of which only very few headquarter cities will be able to maintain themselves successfully in the end.

2.1.2 Cohesion in the EU

What then has been achieved by the EC with its aim of economic and social cohesion professing;

...a willingness to act systematically to reduce disparities and inequalities to allow every region and every citizen to participate and draw benefit, in a fair and proper way, from economic, social and cultural progress (Hingel, 1992/93, P.89).

Or, alternatively, are the approaches being taken to develop the Single Market reinforcing regional disparities? (Keane, 1995).

With the reform of the Structural Funds in 1988 the EC showed its commitment to the problem of regional disparities and has allocated 70 per cent of all available funds to the four poorest Member States, i.e. Spain, Portugal, Greece and Ireland (EC, 1994). Income per head between the Member States has narrowed significantly over the past decade (EC, 1996). According to the EC Report on Economic and Social Cohesion (EC, 1996) this is largely due to the aforementioned four poorest Member States catching up with the rest. Between 1983 and 1995 Ireland had an average growth rate of 4.5 per cent a year, which was followed by Spain with 3 per cent and Portugal with 2.6 per cent (EC, 1996).

In spite of this, disparities between the richest and poorest regions remains large. The EC (1994, P.10) notes that "in 1991, the top ten regions had an average income per head three and a half times greater than the bottom ten" and over the past decade income disparities have remained largely unchanged (EC, 1996). In addition, the Community continues to fail in the area of job creation. The EC (1994, P.48) state;

The immediate prospects appear to be relatively unfavourable. For the Community as a whole, estimates suggest that economic growth needs to exceed two and a half per cent a year to keep unemployment from rising and this it has consistently failed to do in the initial years of the 1990's.

Unemployment over the last decade has also become more uneven with those regions with the lowest rates of unemployment able to reduce it further while there has been a dramatic increase in those regions with the highest rates of unemployment (EC, 1996).

Hingel (1992/93) highlights the discovery of Boltho that the level of disparity is lower in the US than between regions in each of the major European countries. Unfortunately the enormity of the task to reduce these disparities must be accepted and as regards time, it will be a very long term process (Keane, 1995, Hingel, 1992/93). Disparities have and always will exist in a dynamic economy and thus it becomes the concern of the region to ensure its own survival. Regions can not depend on the EU to create economic prosperity for them. In fact, a recent evaluation of EU Structural Funds in Ireland (ESRI, 1997) has projected that the long-run impact of the two Community Support Frameworks, which have run since 1989, will be to raise the level of GNP by about 2 per cent above what it would have been without them.

2.1.3 Harmful Effects of the Single Market

Small and medium sized enterprises (SME's) are feeling pressure from the internal market and their survival is being threatened due to the large increase in mergers and acquisitions that are taking place. In a direct response the Danish Network Programme was created "to encourage the formation of binding co-operation between SME's as a way of enhancing international competitiveness" (Jakobsen, 1995, P. 206). The restrictive control that large bureaucracies may hold in Europe, protecting their own interests and subsequently restricting those smaller and weaker, is also a concern. Even more threatening however, is the opinion of Krugman and Venables discussed by Keane (1995) that, improved accessibility to peripheral regions with the aim of attracting investment could actually hurt them.

They believe that when transportation costs are reduced it allows production to be located where it is cheaper, but also allows production to be concentrated in one location thus benefiting from economies of scale. Therefore, instead of production shifting to the periphery due to integration they contend that “when production is concentrated it may pay to concentrate it at the location with higher costs, but better access” (Keane, 1995, P.1-60). It would be ironic if one of the major policies of the EC, that is improving accessibility in peripheral regions, turned out to be detrimental. The belief that through the Single European Market prosperity will trickle down to the peripheral regions is questionable and the acceleration of large agglomerations in the core of the EC to the detriment of the periphery appears more probable.

2.1.4 The Role for Regions in the EU

While significant disparities remain, Europe outside the core is shifting, where since the 1970's peripheral regions have achieved above average growth compared to the capital cities achieving only average growth (Keane, 1995). Small rural districts and towns have become dynamic in their own right entering the ‘complex mosaic’ whereby all over Europe cities and regions will be declining and growing. “Transfers of wealth alone will not bring about a cohesive EC” (Hingel, 1992/93, P. 118), and with the inclusion of the Visegrad countries into the EU in the future, the economic problems of the former East Germany and the high levels of immigration into the Community, the Structural Funds will be more dispersed and redirected. Some new islands of innovation have been created such as, Munchen specialising in biotechnology, and Grenoble specialising in artificial intelligence, but these required massive financial support and political steering. This cannot be a universal solution.

The role of the EU is one of facilitator and supporter of local management, not as a capital transfer institution. Subsidies simply cover up the factors that caused the problem in the first place. Instead, the establishment of appropriate technological transfer systems and the design of development models that encourage the resurrection of local competencies will lead to true regional development. Economic growth policies undertaken by the EU can not be successful without corresponding and adequate

economic policies at regional level. The EC can not do it all alone and likewise should not attempt to. Policy development and implementation should begin at the local and regional levels. This however requires effort and time and the question is whether the regions have the willingness and competency to bring about local economic development instead of relying on the core for handouts.

2.2. ADDRESSING THE REGIONAL PROBLEM

New economic activities come about through innovation. Shapero believes 'real innovation' to be the founding of a new firm and "therefore has no existence without the entrepreneur" (Sweeney, 1987, P.8). The characteristics of an entrepreneur include an internal locus of control, superior information processing, a willingness to take risks, a need for achievement and the ability to handle failure and learn from previous experiences. Also, working from intuition they often remain apart from the formal economy due to bureaucratic barriers. Malecki (1994, P.121) comments that;

It has become standard thinking to place responsibility for the bulk of employment generation within regions as well as nations, on entrepreneurship as to use it as a primary indicator of regional well-being.

Often entrepreneurs will set up firms in their own area in the overall path towards economic success. This entrepreneurial potential originates in their local environment and includes, "a shared and distinctive culture or value system, a technologically oriented education system and autonomy of information" (Sweeney, 1995, P.2-1). These issues will be addressed in the subsequent subsections.

2.2.1 Learning Efficiency and Scientific Determinism

Knowledge is never complete. To progress technically innovation must be diffused with the adoption of best practice. In the continual pursuit of knowledge a region must possess the willingness to learn, especially from external sources, and the ability to adapt this knowledge to suit their own particular needs, which are in turn being shaped by the customers who are demanding higher quality and customisation.

The loss of learning efficiency in technical progress and the inability to apply new knowledge is striking when the US and Japan are compared. Although R&D spending in the US is still three times that of Japan, America has been unable to turn new knowledge into commercially competitive products while Japan, upon purchasing technological information from the US, has made more use of these fruits and now, for example, dominates the numerically controlled machine-tool industry (Reich, 1989). Mowery and Rosenberg (1993) agree that US firms are slower to adopt new manufacturing technologies and fail to utilise these technologies as effectively as foreign firms. Large R&D projects therefore, although attention catchers, do not necessarily lead to economic prosperity. "What is more critical is the capacity to absorb and exploit new technology" (EC, 1994, P.11), an efficiency of learning of existing knowledge rather than the generation of new knowledge. A willingness to learn and share information distinguishes technically progressive firms.

In consequence, it becomes apparent that investment in research and development (R&D), or being in possession of a large amount of 'high technology' industries do not of themselves guarantee economic development and prosperity. This "myth of high-tech as the solution to the crisis" (Fast, 1991, P.58) highlights the complexity of the innovation process, a process which may achieve greater success by following the "quiet path to technological preeminence" (Reich, 1989, P.19) rather than by focusing narrowly on R&D.

Scientific Determinism - Major features of the mass production era was its treatment of the environment as an externality and its promotion of individualism which resulted in social disintegration. This era was, the remains of it being still here today, all about control and dominance with management greed and the pursuit of personal financial gain taking precedent over the development of the community. Volume and price rather than the diversity, design and quality of the product gained greater importance. All knowledge had to become scientific, falling into the trap that this would lead automatically to economic prosperity. The tacit, that is the intangible competencies of

human experience, of feel, of intuition were ignored. As knowledge became formal and explicit and as new thinking became restricted the flame of innovation was extinguished.

The intersection of the transforming technology produces productivity improvement and innovative development only when it is integrated with tacit competencies in the product and production engineering technologies or tacit competence in a profession (Sweeney, 1995, P.2-21).

Competition based on price and low labour costs has been coupled with an under-investment in production capacity since the 1960's. Technical progress in most Anglo-Saxon economies has given way to financial speculation. Control prevailed and repetitive tasks and centrally controlled decision making resulted in a decline of learning efficiency. A culture where greed gives way to a shared value system and where decisions are reached through consensus is required in order to realise the full potential of the information economy.

2.2.2 Culture

Culture represents the whole value system of a region, in simple terms the way things are done. The culture of determinism and of the individualistic value system is now representative of declining economies and thus the culture of dynamic regions must be examined in an effort to return to the path lost during the mass production era. This is a culture of mutual trust, informal linkages and internal cohesion. To change one's whole culture is an enormous but necessary task for many regions in the West.

The aesthetic faculty and the uniqueness of a product was lost in mass-industrialisation with creativity killed through homogenisation. With the realisation that innovation stems from a regions own ethnic characteristics and specialties, such distinctive capabilities must be nurtured and developed further. Hardill, Fletcher and Montagne-Villette (1995) examine the competitive advantages of distinctive capabilities and regard the distinctiveness of the Le Choletais, a region in France characterised by its social immobility, strong social stratification, paternalism and staunch Catholicism, as a major

reason for its success economically. It becomes apparent that historical developments shape future abilities and that the environment holds the key to development.

Civic Culture - The extent of democracy and responsibility for the welfare of the community appears to correlate with the efficient functioning of regions and their ability to maintain social cohesion in the face of change. This, Hingel (1993) regarded, as the main contributory factor in the difference between North and South Italy, the Emilia-Romagna and the Apuglia regions. Likewise Sweeney (1995, P.2-17) believes;

Those places which have a strong civic tradition and local autonomy tend to be the ones which generate their own prosperity and also, because of their greater civic pride, are more sensitive to the environment, their own environment.

The Mittelstand in Germany is loyal first to its community with relationships based on mutual trust. It is a culture of sharing and intense voluntary involvement compared to the UK, for example, where profit and not the welfare of the whole community is the prime goal. As a nation Ireland must embark on a process of restoring its lost pride with ensuing social and economic benefits for its people, an indigenous process growing from local strengths, not from foreign monies.

Technical Culture - The inability to create innovative products, to adapt new technologies into existing ones thus creating original procedures, identifies nations lacking in skills, nations that have lost their technical culture. While Japan has the willingness to move into unfamiliar business areas and holds the skill base to assimilate new technology Walker (1993) describes how the UK is failing to be innovative and how its manufacturing industry is falling into foreign hands. He predicts that by the mid 1990's the proportion of manufacturing that is in foreign hands could be as high as one third with a large share of this in Japanese hands. As the UK increases its concentration on service industries it moves steadily towards becoming a low wage, low productivity economy, lacking the technological skills of Japan and trading in, rather than producing goods. As Walker (1993, P.163) concludes;

But it is also the consequence of the greater dynamism in Britain of services and other activities, and of the prevailing economic culture, even ideology,

which has come to place quick gains before the patient, long-term development of industrial capabilities.

Malecki (1994) includes the presence of a strong small firm sector and a tradition in the locality of being self-employed as cultural influences on entrepreneurship. Also, previous entrepreneurs in a locality can act as role models passing on experience, knowledge and even capital. Badham (1992) shows how countries will receive substantial advantages if a high trust production culture is integrated with a competent skill based production force. Therefore, all the trust and co-operation of the shared value system may be futile unless a technical culture exists, a culture which can be enhanced through the technological orientation of the education and training system.

2.2.3 Education System

An education system that develops imagination and creativeness is an essential requirement in the promotion of innovation (Piatier, 1981). Innovation and the foundation of a new firm can not be achieved without the availability of a well-trained and skilled work force and, it is the contention of Sweeney (1992) that regions possessing a strong technological education and training system are better equipped to generate their own prosperity.

Vocational Vs Academic Training System - In central European countries the State recognises the importance of vocational training, of craftsmanship, and of the need for a highly skilled work force. The issue relates to the whole culture of a nation whereby in Denmark and Germany the craftsman holds a high social standing while in Ireland and the UK a trade skill is not deemed as valuable or as important. Sweeney (1992, P.71) talks of this fixation on high technology having its origins in a culture which has “glorified the theoretical and academic at the expense of application”, and describes the Irish education system as “academically elitist”. In Denmark and Germany training at school and in industry are linked producing a highly skilled work force which has the ability to apply new knowledge and technology to an existing profession. Within the vocational/apprenticeship education system training can be gained up to the level of Ph.D and those who achieve the title of Meister (master craftsman) have a high social

standing. Germans therefore, originally trained in engineering have the skills to integrate information technology into their existing professions, thus expanding their range of skills. There exists a co-ordination between all actors, an integration of work systems such that vocationally trained work forces are better able to cater for the flexible technology requirements.

In Britain it would appear that the lack of co-ordination between its actors explains the demise of integrated education and training systems and the subsequent demise of its integrated work systems (Fast, 1991). The French Grandes Ecoles produce technical experts who apply existing knowledge rather than researching and creating new ideas (Chesnais, 1993). It is pointless having knowledge unless the receiver competence is also in place to access it (Eliasson, 1995). Such competence depends on the skill base of the population, it requires a strong vocational training that will not only produce craftspeople that will create their own firms but, sophisticated operators who by understanding how their machines work will be able to develop new approaches and innovative ways of doing things. Technology created today may be obsolete tomorrow requiring the continual absorption of new technology into existing knowledge.

Higher Education - While Malecki (1981) agrees that R&D and innovative activities depend on a skilled work force he continues (P.316) that;

..university and government laboratory locations have only rarely resulted in the significant agglomeration of R&D activities if industrial R&D was not also present.

An essential requirement therefore of university research would appear to be its effective integration with industry to achieve economic value. It must be remembered that a technical/vocational education is available to more people than a university education, and while Keck (1993) is of the opinion that the higher education system in Germany is one of the weak points in the country's system of innovation due to weak scientific research, Germany is able to overcome this deficiency at present due to the strength of its technically educated population.

2.3. SMALL AND MEDIUM SIZED ENTERPRISES (SME'S)

There are about two million industrial enterprises in Europe of which over 99 per cent are SME's (Al Heurlin, 1995), a resurgence of which has been happening worldwide since the 1970's (Cooke, Morgan and Price, 1995). Although the difficulty of stimulating innovation in SME's by external means has been recognised (Louzada, 1995), governments are now looking more and more to small firms, and new firms, which are regarded as the major sources of innovation. A high rate of new firm start ups will ensure a continuous stream of innovation and thus the fall in the rate of entrepreneurship across Europe is worrying.

The history of technological activity suggests that the origin of innovative activity will be small firms from outside the industry where inertia and management styles do not constrain interest only to traditional lines of business (Malecki, 1981, P.325).

The Technology Development Centres (TEKES) in Finland, the Innovation Centre Networks in the Netherlands and the Danish Network Programme have all been created in recent years as support mechanisms for their SME's. The networking supports include consultants and technology experts, provision of marketing knowledge and the encouragement of co-operation between SME's through the development of a network infrastructure. These programmes strive to overcome the deficiencies of SME's as, although receptive to new knowledge with the ability to react quickly through the use of efficient and informal communication channels, they often lack the resources required (Malecki, 1981, EC, 1994). The actual success of such programmes will be returned to later with particular reference to the Danish Network Programme.

Bureaucratic procedures and the burden of participating in Government programmes are often too heavy for SME's and collective R&D activities and the reduction of red tape are regarded by many as the solution (Louzada, 1995).

Rothwell (1995), however, disregards the belief that small firms have an innovatory advantage over large as (P.268), "the advantages of large firms are mainly material while

the advantages of small firms are mainly behavioural". A nation full of SME's, which although innovative, would find it difficult to access external information and would lack the resources to actually undertake large projects. This could hardly be regarded as the ideal situation. While although;

..a diversified structure consisting of small firms more than large ones appears more efficient because the less hierarchical control and the more horizontal exchanges between local firms will permit a greater market flexibility (Fast, 1991a, P.27).

With large firms concentrating more on core activities and increasing their subcontracting requirements, a relationship can develop whereby small firms acquire the much needed capital and access to management expertise, while large firms can receive a greater amount of ideas and access to new markets (Malecki, 1994). Eliasson (1995) goes as far as to say that the large technologically advanced firms service the rest of the economy by introducing new experimental technologies that then diffuse down to the less advanced firms, especially through the turnover of staff and through their subcontractors. However, new technologies in small firms will also be taken over by large firms through mergers and buy outs. The degree of intensity of small firm networks will indicate their level of sufficiency against such happenings.

Relationships between large and small firms are like personal relationships, all unique taking different shapes and forms. In turn, the local culture will shape these interactions.

2.3.1 Co-operation and Collaboration

According to Jakobsen (1995) the advantages of co-operation include a reduction in the cost of production, better access to resources (know how, finance) and minimised risk through, for example, joint R&D. Disadvantages relate to the costs that arise from investment in mutual activities, the loss of independence that can be experienced by the individual firm and the time consuming nature of the process.

Although Jakobsen (1995) describes the Danish Network Programme as a success, many of the networks formed were between managers who had known each other or had co-operated previously. It did not seem to have much success however with those who continue to regard co-operation as a sign of weakness and who have no intention of sharing the information that they possess. The Mittelstand which is renowned for its strong sense of local pride and community solidarity is “generally unwilling to share knowledge and acquire new skills on account of their innate conservatism” (Cooke, Morgan and Price, 1995, P.167). Their fierce independence which was once their strength may become their downfall. German industry since the end of 1991 has shed 1.13m workers, a loss of nearly ten per cent, and the Mittelstand is starting to invest abroad to average out costs (Norman, 1995).

A culture conducive to co-operation and trust is required now more than ever to ensure that SME's can compete in the competitive global market. Trust, based on past experience and developing from tight local networks (Malecki, 1994) has long been a major resource when found in a region. Often believed impossible to create Sabel (1993) brings new insight by suggesting that a thin line exists between trust and mistrust, and that it can be crossed with ensuing advantages.

A visitor to Prato today, for example, will hear lots about how trade unions and employers associations are working (as they apparently always have) to solve the problems of industrial adjustment, but nothing about the fact that for almost a decade after a wave of decentralisation in the late 1940's, the unions and manufacturers were unable to sign a single collective bargaining agreement (Sabel, 1993, P.172).

2.3.2 Competition

In order to survive competition, firms will remain dynamic and innovative leaving no time for complacency. Small firms in turn tend to be more innovative due to this pressure of survival in fiercely competitive markets. In turn, demanding customers place further pressure on the innovativeness of a firm. Thus, efficient learning can only take place in competitive markets and their organisation is therefore a major policy requirement for the achievement of sustained economic growth (Eliasson, 1995).

Fahrenkrog (1995) and Bellandi (1992) approach this issue examining the way in which firms co-operate in rivalry, leading to the creation of dynamic markets and networks. Bellandi (1992) continues by addressing the harmful forms of rivalry and it appears that the real difficulty is in the attainment of the correct balance in a region between co-operation and competition.

Gelsing (1995, P.121) discusses Eric Von Hippel's study of this paradoxical area of co-operation between rivals stating;

It is a 'barter-relationship' where information is disclosed only when information of similar value is likely to be given in return.

The relationship is more complex, as within tightly defined networks with a high degree of sub-contracting, information is not regarded as a property but is exchanged freely. Information is interpreted and used differently by each individual user and thus progression occurs while maintaining competitive.

2.3.3 Sophisticated Users

With the market becoming more information intensive the demands of the public are becoming more specialised with greater concern for safety, health and the environment. Firms in turn have had to become more receptive to the needs of the market and Italian firms have survived in the face of Japanese price competition by providing customised products tailored to the needs of their clients (Amendola, 1992).

Such receptivity will be of little use though if linked to conservative users with poor technical competence and thus offering little scope for innovation. It is critical therefore to note that although user-producer relationships lead to the transfer of essential information, unless users are technologically sophisticated and demanding, continuous innovation will not take place (Fagerberg, 1995).

The role of the progressive customer is undoubtedly a major cause of the gap between the respective poverty or richness of regions in information (Sweeney, 1987, P.196).

Malebra (1993) introduces the concept of virtuous cycles which relates to technologically progressive users demanding innovative equipment which when produced leads to further demands, and vicious cycles where the lack of technological competitiveness by one in turn hinders those linked to it. Demand for a product is simply not enough unless this demand requires highly sophisticated products. A comparison of German and Irish users in relation to their respective degrees of sophistication would without question uncover some interesting conclusions although it would be an extremely difficult task and their effects on innovation would be hard to quantify.

2.4. INDUSTRIAL POLICIES

In a market ever increasing in competitiveness and in demand for quality and customisation, networks have become an increasingly attractive instrument occurring through transaction intensive structures which are locally based. Fahrenkrog (1995, P.214) differentiates between clusters of firms defined as “groups of firms which have established over a period of time a relatively high degree of collaboration”, and networks of firms defined as “a more ad-hoc collaboration when firms need to satisfy specific needs”, for example, R&D, market information, etc.

Clusters and networks can contain both large and small firms, and only small firms, and become closely integrated through their shared culture achieving economies of information and scope. Networking is not only steadily increasing in size but also in complexity (Hingel, 1993). The various forms of integration and the variety of relationships that can exist have led to many new forms of industrial organisation in this post-fordist era with the ‘industrial district’ and the ‘innovative milieu’ receiving most attention.

Industrial districts, defined as agglomerations of firms in the same industrial sector where different phases of production are often carried out by different local firms, have caught the attention of policy makers due to their economic success. The prime

example is that of the Italian industrial districts where Emilia-Romagna, for example, is well known for its knitting, machine tools, footwear, etc. specialisations.

Industrial districts are a particular type of agglomeration characterised by a 'localised thickening' of the inter-industrial relationships which is reasonably stable over time (Malecki, 1994, P.136 on Becattini).

Attention in recent times has shifted with the call for districts to become more industrially diverse as;

The efficiency of an industrial district does not depend on its specialisation in a particular activity but on its capability to manage around a dominant branch, many activities of a complementary character, dependent in a vertical as well as horizontal sense (Fast, 1991a, P.21).

Propinquity breeds strong competitiveness (Grego, 1995), but for a district to remain dynamic, to face the pressures from external change, it must be created on diversity and on the complementarity of its industries and skills. Specialisation will also lead to the enhancement of learning efficiency as the product is developed further.

The milieu has been defined as;

Sets of local players who through their complementary know-how have developed their own rules of co-operation and competition and have highlighted opportunities in their technological and market environment (Maillat, 1995, P.158).

The milieu is formed around a common technical culture where through the interdependency of local players information is circulated resulting in a dynamic continually changing system which breeds innovation. To be truly innovative the milieu must be receptive and open to changes happening in its external market. Also, the milieu must not only be able to respond to market changes but anticipate them, an active phenomenon which originates from the region itself (Maillat, 1995).

2.4.1 Skill-Based Models

With the new forms of organisation structure came new production systems releasing much debate over the various models of 'best practice production'. In large, a shift has occurred towards flexible specialisation to cater for small batch production requirements, despite the belief by some that the "technological dynamic of mass production has in fact been revived" (Piore, 1993, P.330). Small networked manufacturing facilities are more cost effective and adaptable than large production facilities and thus, flexible production technologies are growing in prominence (Greenwood and Parsons, 1995).

Flexible specialisation is simply responding to the increasing demands for specialisation, a process for which the small firm networks are ideally suited, and thus has been the crucial factor in the success of the Third Italy. The possibility of transplanting the Italian industrial districts success story does not appear so promising however, due to the difficulty of copying flexible specialisation in other regions (Hardill, Fletcher and Montagne-Vilette, 1995).

Flexible automation similarly appears to have varying successes largely due to the skill level of the region. Flexible technology requires skilled workers and a conceptual understanding of the production system which the US, in comparison with Japan, does not appear to have. A major adjustment of many national education systems is required.

2.4.2 People

Reverse engineering which perceives the entire production process as an integrated system is one of the elements of the Japanese success story (Lundvall, 1995). People are no longer regarded as a commodity and are acknowledged as an important input to the overall performance of the system. This ideology of 'peoplism' recognises the most crucial resource as being the human one. Active participation in Japanese quality circles not only improves worker capabilities, skills and work motivation, but it was also discovered in a survey undertaken at the end of 1983 of the Japanese automobile

industry that minor improvements that originated from quality control circles and suggestion schemes had a greater cumulative effect on labour productivity than the automation technology (Watanabe, 1993). The UK, for example, has not experienced the same degree of success from the introduction of quality circles due to the lower level of skills of its employees.

Badham's (1992) 'skill-based automation' puts people in control of the technology integrating the technical and the tacit skills, making full use of the users skills and experience in the design and development of the whole system. Such an organic system depends on the integration of people, technology and the organisation where different solutions may be arrived at as production technologies move towards a "technological pluralism" (Amendola, 1992). Competition and customisation have created the need for flexible technologies which depend on a skilled work force for their effective utilisation and for advancement towards unique requirements in specific fields. Badham (1992) questions whether skill-based automation can be a universal solution due to the lack of skills in certain nations. However, for a nation to progress technologically is a high level of skills not required for whatever avenue is taken? Therefore might it not be that skilled-based automation is the way forward for all, but that some will have to work harder than others to catch up.

Interestingly, the developing countries are not overshadowed by the damaging remnants of the fordist era, a philosophy so instilled that many developed countries find hard to leave behind. Developing countries appear to be more open to the new production processes and are quickly becoming highly skilled. Through these skills they can also reduce any exploitation that was experienced at the hands of MNC's.

2.4.3 Branch Plants

Central to any discussion about branch plants is the acceptance that a region must be capable of stimulating its own economic activities. It must not simply depend on inward investment for its development. This reiterates Maillat's (1995) view of the territory being the key to change and development. Endogenous development depends on the

existence of local control and decision making where the type and scale of production that will suit and integrate with existing industries and their environment is adopted.

Endogenous development does not exclude exogenous firms if they respect their new community and integrate and facilitate its economic progress. Unfortunately this is not often the case and many regions become 'branch plant economies' dominated by large corporations where control is centralised in their country of origin. Their dominance often pushes out smaller firms that existed in the region instead of integrating into the small firm networks. Depressed regions have strived to attract branch plants, regarded as the answer to their economic problems, but often provide only low to semi-skilled employment concentrating their more skilled R&D activities in the centre. In turn, those with skills are forced to leave thus depressing the region further, draining its innovative potential.

Regions whose economies are principally involved in branch plant production have become increasingly recognised as being inhibited in both technological innovation and in the formation of new firms (Malecki, 1981, P.315).

Branch plants instill a climate of dependence resulting in a deterioration of technological innovativeness. This passivity avoids the investment and time required for indigenous innovation to develop, an illness from which nations such as England and Scotland, where inward investment has largely been of a product assembly plant type, appear to be suffering. Ireland, in recent times, has invested heavily in education and infrastructure and is regarded by some as a "centre of excellence" in the fields of electronics and software (EC, 1994). However, Ireland's recent economic success story, in relation to its GDP figures, can be in part attributed to the transfer price fixing strategy of the MNC's, and whose involvement in the country has done little to benefit indigenous industry (Shirlow, 1995). Gains from inward investment in Ireland were mainly made in the 1970's and Gudgin (1995, P.14) notes;

The thirty or so new foreign companies each year since then have offset the annual closure of five per cent of the stock of 800 foreign-owned firms.

Thus, while industrial growth in Northern Ireland does not appear as impressive as the Republic, the North, due to its difficulties in attracting inward investment has concentrated more on developing and helping its existing industries and indigenous firms, creating a more stable, sustainable, domestic base for the future.

The effects of foreign investment by TNC's will not always be negative, and it remains the prime way in which international technology is transferred (Sweeney, 1995a). TNC's in advanced technologies can act as national receivers of global technology that, not alone can be used in the company, but subsequently diffused throughout the economy (Eliasson, 1995). TNC's provide a high standard of training and can pass their skills and technical know-how on to the local labour force.

Once a rare sight, regions are now insisting that exogenous firms integrate into the locality. Authorities want to know the amount of technology that will be involved, the part that can be played by local suppliers and the extent of knowledge transfer that will take place. Technology transfer becomes more efficient in a knowledge intensive and highly skilled economy that has the ability to catch up quickly. In this situation the locality holds more negotiatory power, can demand local sourcing and achieve the creation of a regional network in which the branch plant will be fully integrated.

Countries that are upgrading their industrial structures and that are emphasising and supporting their indigenous industries will be successful in attracting TNC investment in R&D activities (Lundvall, 1995). TNC requirements are changing as they move from take-overs and mergers to strategic alliances and joint ventures. In turn, the incentives to invest have become crucial in determining the right business location.

2.4.4 The Incentives to Invest

The EC (1994, P.83) listed the determinants in the choice of location of new inward investment as;

Proximity to market, quality and availability of labour, suitable infrastructure, quality of life, cultural affinity, promotional policies and the existence of other small firms in similar areas of activity.

The UK remains as the top recipient, receiving as much as 40 per cent of all foreign direct investment coming into Europe and holds the advantages of its “English language, an extremely open business environment, relatively low labour costs and flexible employment practices” (Buxton, 1995, P.16). Ireland holds a further incentive, that of large high amenity sites. Financial incentives are simply the icing on the cake where few will base their decision to invest on cost alone (Van Herwaarden, 1995). While the Northern Member States are concentrating on developing their business environment and small enterprises, the Southern Member States and Ireland are unfortunately increasing the least important factor in the attraction of ‘progressive firms’, their financial incentives. The Industrial Development Authority Ireland (IDA) offers capital support with no restrictions on profit repatriation to foreign investors and claims that it costs government IR£12,850 for each job it creates (Brown, 1995), a figure alleged to be falling. However, it has been estimated that the package surrounding the Intel investment cost the government £50,000 per job created. The total grant aid will not be revealed for several years but it is estimated to be between £80m and £90m (Murphy, 1995). There are those who ask whether such money would not have been better spent on developing the country’s indigenous industries rather than becoming further dependent on TNC’s?

Foreign direct investment has a role to play in the economic development of a region but over estimation of its benefits must be avoided and the damage it can cause must be fully contemplated, with adequate policies ensuring first and foremost that the local economy is the primary beneficiary.

2.5. FINANCIAL INSTITUTIONS

With the process of innovation tied up not only in the cultural but also in the institutional structure of a nation, the contribution of the national financial systems to the financing of innovation will reflect such institutional differences. The extent of

borrower-lender relationships and the degree of adversity to risk, represent crucial elements in the attainment of such finance.

Christensen (1995) discusses this relationship between finance and innovation presenting interesting national differences. The US and the UK for instance, have a 'capital market based' financial system with the role of banks limited to the provision of short term capital. France and Japan have a 'credit based' financial system where the flow of capital will be influenced by government to areas of high priority while lastly, Germany holds a 'credit based institutional system' characterised by its strong ties between industry and finance and the prominent role of banks in the ownership of firms. The credit based system gives rise to a longer term learning process between lender and borrower, while the capital market based system attracts traders in shares simply looking for short term price gains in their shares. This has become a major problem in the UK which has failed to direct its highly acclaimed financial institutions into a close involvement in industry.

Meanwhile, "the lure of the huge US defense market has diverted the attention of the US companies from global commercial markets" (Porter, 1990, P.74) and has witnessed US economic strength fall behind that of Germany and Japan which have had very small military budgets since the end of World War Two. Deregulation of the financial market in the US in the 1980's resulted in the concentration of capital in large banking institutions, and small firms face increasing problems of trying to get their projects financed. In contrast the Japanese financial system under government influence achieved industrial growth through the development of its banking system where, interest rates were controlled and loans to small firms that showed potential were made easily accessible.

The role of the local bank has been crucial to industrial expansion in countries such as, Germany, Italy and Denmark. Through their autonomy and knowledge of the local system and industrialists they have played a major role in financing local projects. These local trust banks have in turn played their part in reinforcing local autonomy.

The relationship between the venture capital market and the formation of new firms is critical to ensure continuous creation, a market highly developed in the US renowned for its high level of R&D. However, while the US holds an impressive record in R&D and in the number of new start ups this must be complemented by a competent work force with the ability to interpret new information, a feature that appears to be lacking. Venture capital, although important, is only one element of the support network in the creation of new firms, and not the most vital as in Germany the strong banking system provides adequate support in the face of a weak venture capital system.

A highly developed banking system that works hand in hand with local industry, that supports and satisfies specific needs and that is willing to take risks based on past experience and knowledge, will contribute to the successful creation of new firms enhancing the innovative potential of the whole nation.

2.6. SYSTEMS OF INNOVATION

An innovation system can be described as “a place of initiatives and adaptation to structural change” (Gaffard, 1994, P.35). Despite the increasing processes of globalisation and regionalisation, writers such as Lundvall and Nelson stress the continuing importance of national systems and Porter (1990, P.73) believes that “in a world of increasingly global competition, nations have become more, not less, important”. While undoubtedly systems of innovation are transcending national borders, in general, nations have their own institutional structure (financial, education system, training, etc.), culture and unique production system. Nations hold a common bond which becomes their strength, if used properly. National systems can support and direct the process of innovation and learning, a process always wrought with uncertainties functioning, in effect, as a stabiliser in-between the region and the global market.

Remembering that innovation is a local phenomenon, the nation state is simply providing the framework, creating an environment in which innovation can flourish. Economic development thus depends on the locality and its ability to remain competitive in the face of international advances.

It is a strategy rooted in international trends but it builds on local strengths - the only recipe for success in economic development as we approach the 21st century" (Greenwood and Parsons, 1995, P.159).

2.6.1 Regional Policies

A local approach is thus being put forward with attention placed on the indigenous potential of regions and the local systems that they incorporate, a process overseen by the nation state. It is not bottom-up or top-down. It is rather an all-inclusive system of horizontal interactions and relationships where individual local structures and policies occur within regional structures. In turn both contribute to, and benefit from, the established national framework. The emergence of regions such as Baden-Wurttemberg and Emilia-Romagna stress "the existence of local specificities being not explainable through national differentiations" (Fast, 1991a, P.4). Unfortunately, it is feared that as Europe strives for closer cohesion, the new development model of network-led integration will produce more dense networks in the centre increasing existing disparities (Hingel, 1993). This situation strengthens the role of the state with the need for more effective regional policies to help the weaker who have been hurt by integration. It requires the effective integration of regional and national industrial policy as, is it not that these regional variations "are as much the cause of technological change as they are its effects" (Malecki, 1981, P.328).

2.6.2 National Advantages

The ability to be competitive emerges from a home environment that is both forward looking and challenging (Porter, 1990). Porter presents his diamond of national advantage as the key to sustained economic success, although largely based on regional and local case studies. The diamond consists of:

1. Factor conditions - The nation's position in factors of production, such as skilled labour or infrastructure, necessary to compete in a given industry.
2. Demand conditions - The nature of home market demand for the industry's product or service.

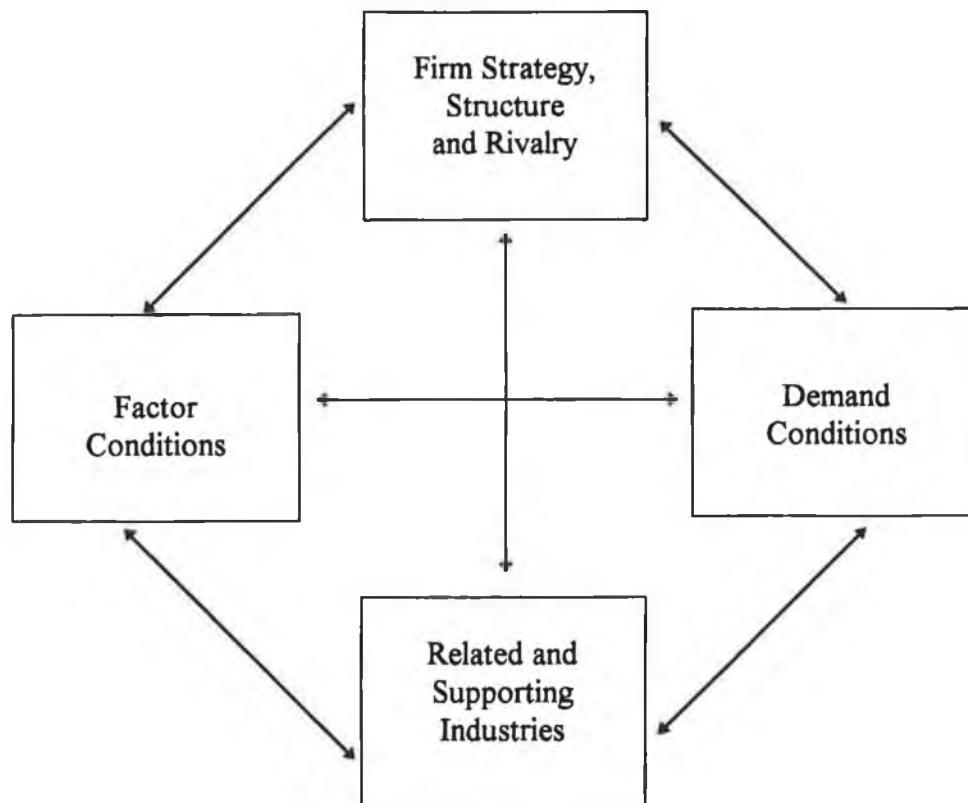
3. Related and supporting industries - The presence or absence in the nation of supplier industries and other related industries that are internationally competitive.
4. Firm strategy, structure and rivalry - The conditions in the nation governing how companies are created, organised and managed, as well as the nature of domestic rivalry (Porter, 1990, P.77) (see Figure 2.1).

The diamond promotes the development of clusters and strongly emphasises the importance of domestic rivalry as a 'spur for innovation'. It incorporates views already presented in this study but offers a more structured and comprehensive picture through the diamond figure. Few nations satisfy all the conditions of the diamond all of the time. However, this is an ideal position to strive for, pointing nations in the correct direction.

A system of innovation must remain open and flexible to survive changes in its environment. The concept of the regional life cycle reminds us that as one region innovates developing a new technology an older region with now out-of-date technology suffers. Its ability to remain competitive will depend on the industrial mix and the technological capability that it possesses and, their ability to reinforce each other. Malecki (1981, P.325) comments that, "for many regions a comparative advantage in science and technology is likely to be only temporary".

Similarly, Utterback (1994) describes how new firms with new technologies will always emerge and overtake established firms. Therefore, it is the ability to learn rather than a current comparative advantage in a technology that is the key to success. Continual change and the need to upgrade is not welcomed, especially by successful firms who instead often try to defend what they have. Germany appears to be following this dangerous path of depending and holding on to its winners while avoiding the nurturing of losers. It lacks a strong presence in technologies that are shaping the future, i.e. micro-electronics and biotechnology, and has fallen behind Japan and the US in high technology according to patent statistics (Fisher, 1995). However, as previously stated it is the application of technologies, not their development, that is most important. In addition, statistics often do not register R&D that is taking place on a more informal basis.

Figure 2.1 Determinants of National Competitive Advantage



Source: Porter, (1990).

Utterback (1994) explains the difficulty facing firms of getting off the path that they are currently on. Although threatened firms will adopt new technology their main problem lies in the fact that they continue to make the largest commitment to the old technology.

2.6.3 Diversity in Systems

Technology is embedded in the institutional structure of a nation and although the UK adopted scientific management practices from the US, and the concept of the German in-house R&D laboratory is spreading, institutional change is regarded as difficult to accept. However, it is important to understand the institutional structure of other countries as, by examining their national systems of innovation the opportunities and limits to institutional borrowing and learning can be established (Lundvall, 1995).

Diversity in systems is what innovation depends on. Countries differ in their natural resources endowment, market structure, industrial structure and whole institutional framework, and these diversities can be evaluated. This is evident from the case of videotex systems in Europe where countries have learned from the French success in this area (Fast, 1991a).

As firms move along their sequential learning process a broadening and enlargement of the range of production processes, rather than a restrictive technological trajectory, should be the prime aim (Fast, 1991a). Flexibility today is essential for success and thus requires access to a whole range of choices and available options. Local systems of innovation are the core of a progressive nation, and the more diverse the skills and knowledge held, the greater the viability and prospects for growth in the medium and long term. It is a system capable of responding to technological changes in its own unique way, building on its core competencies where, "no single most efficient type of local system of innovation exists, but a multitude of efficient systems" (Hingel, 1993, P.33).

2.7. THE ROLE OF GOVERNMENT

Just as production systems now depend on flexibility and diversity society demands similar responses from the government which too must become a learning system catering for a variety of needs, with customisation achieved by devolving powers to local levels. Too many policies have been dictated from the centre which have had devastating effects on a particular region (Malecki, 1981). The damaging extremes in the role that government can take, from one of free market to where the market is protected for too long must be replaced with the 'proper' role, that being one of catalyst and challenger (Porter, 1990). The role of central government is to provide a broad framework which allows local and regional economies to develop endogenously. Such a framework must allow both the formulation and implementation of policies at lower levels.

Gregersen (1995) sees the public sector as a pacer of national systems of innovation 'drawing out' socially desirable innovations based on political values. Strict environmental regulation in Denmark resulted in first mover advantages internationally in water pollution control equipment and windmills, while Sweden's concern for handicapped people led to the creation of a competitive industry focusing on special needs (Porter, 1990). Therefore, instead of simply being regarded as bureaucratic and inflexible, government has the ability to undertake the role of stabiliser and pacer for private firms facing unstable markets. Government now holds the role of creating an environment in which innovation can flourish.

The majority of this policy thinking originates from the Kohsetsushi in Japan where local centres exist to provide training, research and guidance (Malecki, 1994). In fact, the Japanese government operates a network of 195 regional laboratories with half the cost absorbed by the regional authorities (Reich, 1989). The Ministry of International Trade and Industry (MITI) in Japan ensures that co-operative research projects which it sponsors are in the public domain, thus allowing firms to use the information in their own way. Competitiveness does not emerge out of further consolidation through programmes like ESPRIT, but through public access to all new information from which interpretations will lead to innovations. Governments must create a climate of rivalry presenting the challenge to firms to upgrade and innovate.

2.7.1 Their Respective Roles

The public sector has specific functions at each level of authority and, on overstepping these boundaries the formulation of policies outside their level of expertise has often occurred. For example, central government must withstand the desire to interfere in regional affairs where they may often lack the local knowledge required to develop policies successfully. The largely unproductive policy of attempting to 'pick winners' is a case of point.

Global Level - This level incorporates organisations like the United Nations and environmental organisations which see the big picture where survival of the global

economy in the long term depends on ecological sustainability and in a reduction of social inequalities.

EU Level - With its principles of solidarity, equality and social justice the EU strives to reduce disparities and inequalities aiming for the convergence of a community of regions. It provides an essential forum for national decision makers, "a clearing house for information and experience" (Piatier, 1981, P.41). The Community is recognising the importance of the local and regional levels and direct intervention must be replaced by an overall framework in order to encourage their ability to develop endogenously.

The Community can play not only a central role as initiator and catalysis of local development and as supporter of local actors, but also as 'tracer', evaluator and diffuser throughout the Community, of good practices and experiences (Hingel, 1993, P.43).

National Level - The role of central government has been referred to in section 2.7 and holds the task of creating a favourable environment in which innovation can flourish. This role is critical and has not been lessened by Community level input.

Regional/Local Level - This represents the core of the whole innovation process. Regional and local governments deal with the specifics of an area, its attitudes and core competencies. They must stimulate the development of clusters and development blocks and encourage indigenous potential. It requires the creation of a regional innovation system that unites the people under a common goal, the economic development of their community. It will build on distinctiveness and diversity, where local input will ensure that the specific needs of the community are the main priority.

2.8 CONCLUSION

This chapter has attempted to address the many wide and varied issues that affect and influence the economic development of a region. Each area in itself represents a field on which considerable research has, and is being, undertaken and thus, this comprehensive overview has had the role of setting the scene for subsequent chapters.

It has shown that central to the creation of a prosperous and successful economy is the capability to produce and use knowledge. Knowledge is acquired through the social process of learning and it is the foundation of all innovation. Innovation has been identified as a local phenomenon arising out of the unique culture and institutional structure of the region. Thus development policies must be built on core competencies and local specificities where through the integration of the local environment and its actors, sustainable economic and social development will be achieved.

For any nation today it is essential to possess a highly skilled and trained work force where both the technical and the academic are treated equally. Glorification of either to the detriment of the other will prove damaging to the development of a nation. However, just as important is a flexible and adaptable system that encourages innovation and risk taking.

There is no uniform definition of what constitutes an efficient system of innovation as it is a system out of equilibrium that must continually change and reinvent itself to remain viable in the face of global competition. To ensure sustainability the local system must remain open to its external environment, receptive to technological and process advancements and possess the flexibility and skills to react quickly to changes as they occur. Local specificities will contribute to the diversity of systems and therefore, no one efficient way to innovate exists, but a plurality.

Innovation is a complex process due to the influence of cultural factors. Innovation flourishes in a society based on trust, internal cohesion, honesty and equal rights. Within this environment tight social inter-firm networks emerge. They develop over time through informal linkages and are the basis of the industrial districts of Emilia-Romagna and West Jutland. Complex sub-contracting inter-relationships improve the efficiency of learning and a whole technical culture prevails. Within these environments sophisticated and demanding users exist in the presence of a complex mix of competition and co-operation.

Innovation and change is not an easy process but it must become part of the whole culture of a region whereby, firms that continually strive for the improvement of existing processes and the development of new products become the norm, and where anything less is not socially acceptable.

Competitive advantage is created at home by building on local strengths and the sole correlation that is often made between innovation and R&D must be avoided. Innovation is not simply about developing new products but more so about interpreting and adapting new technology into existing structures and processes. It depends on the skills of the people, that is, both technical and tacit skills where existing comprehension can be developed in the light of new information.

In light of this a whole cultural change is required in many nations. Government must accept its role of facilitator of an overall framework so that control and autonomy of decision making is given back to the localities and regions. Employers must realise the value of their employees and the quality, design and diversity of the product must be given greater importance.

No nation can progress economically without the creation of new firms and ideas a potential that must emerge locally from the unique environment, to ensure that a strong sustainable economy is built on indigenous resources and local strengths.

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CHAPTER THREE
NATIONAL SYSTEM OF INNOVATION
IRELAND

3.0 INTRODUCTION

Having established innovation to be an ongoing interactive phenomenon, this complex process must now be placed within a system in accordance with the current popular 'holistic' and 'systemic' approaches to its successful attainment. This "multiple interacting process" (Von Gleich, 1995), required a shape, a form, even simply a title to gain wider acceptance and this it achieved through the facade of a 'National System of Innovation' (NSI). Paradoxically, a process unique to the specific history, culture and individuality of a community at a specific time, has been confined within restrictive boundaries.

In dealing predominately with industrial policies this study follows the OECD viewpoint which is;

Studies of OECD countries have shown that in excess of 60 per cent of economic growth is believed to come from the utilisation of science and technology, leading to the conclusion that technical progress is by far the most important source of growth (STIAC, 1995, P.34).

A similar view that sustainable economic progression is achievable from a strong manufacturing rather than service base is also adhered to here. This is not meant to disregard the importance of the service sector but rather to emphasise the importance of the creative dimension in the production of physical goods. A greater concentration on the development of product technology rather than the simpler and more popular development of process technology, which often simply results in rationalisation, is required. However, both must go hand in hand to achieve real progression. Science does not equal technology and, in turn, neither equal innovation. There is not a linear progression where one automatically causes the other, they interact and influence each other. Thus, it is the complexity of the innovation process which according to STIAC (1995) has a lot to do with inattention to the intangibles and people. Von Gleich (1995) continues this train of thought by regarding the 'biggest problem' as one of attempting to understand the relationship between technology and society.

The Green Paper on Innovation (EC, 1995, P.2) identified a number of weaknesses in Europe's research and industrial base. These included:

1. Financial - the EU invests proportionately less than its rivals in research and technological development.
2. Coordination - there is a lack of coordination at all levels of research and technological development (RTD).
3. Convertibility - the limited capacity that exists to convert technological breakthroughs into commercial successes.

The report describes the 'European Paradox' where, although the Community's scientific performance has been excellent, it is becoming inferior in regard to high technology sectors and is failing to convert this technological research into commercially competitive innovations. Another worrying factor relates to the expenditure on R&D which the Green Paper (EC, 1995, P.16) identified as varying by a factor of one to eleven from country to country and that the "proportion of national R&D carried out by businesses varied from 30 per cent to 70 per cent". Thus, the report illustrates a mixed picture as regards innovative activity within the Community and while its importance is achieving wider recognition it accepts that a lot more effort is still required. The report directs attention to the importance of human resources, the orientation of research toward innovation and discusses the emergence of the environmental protection industry estimated to currently employ one and a half million people.

In the light of such findings nations are attempting to identify and analyse their own systems of innovation to better understand their strengths and weaknesses. This chapter will first address the new found interest in National Systems of Innovation, a term coined as recently as 1989. It will question whether National Systems are the most appropriate level at which to analyse, measure and stimulate innovation, or whether the national level should be just one of many, i.e. regional, EC, global, all interacting and undertaking functions most suited to their levels of authority. Whatever conclusions are

drawn however, the national level becomes the obvious starting point for an in-depth analysis of Ireland, and this will constitute the remainder of the chapter.

3.1 NATIONAL SYSTEMS OF INNOVATION

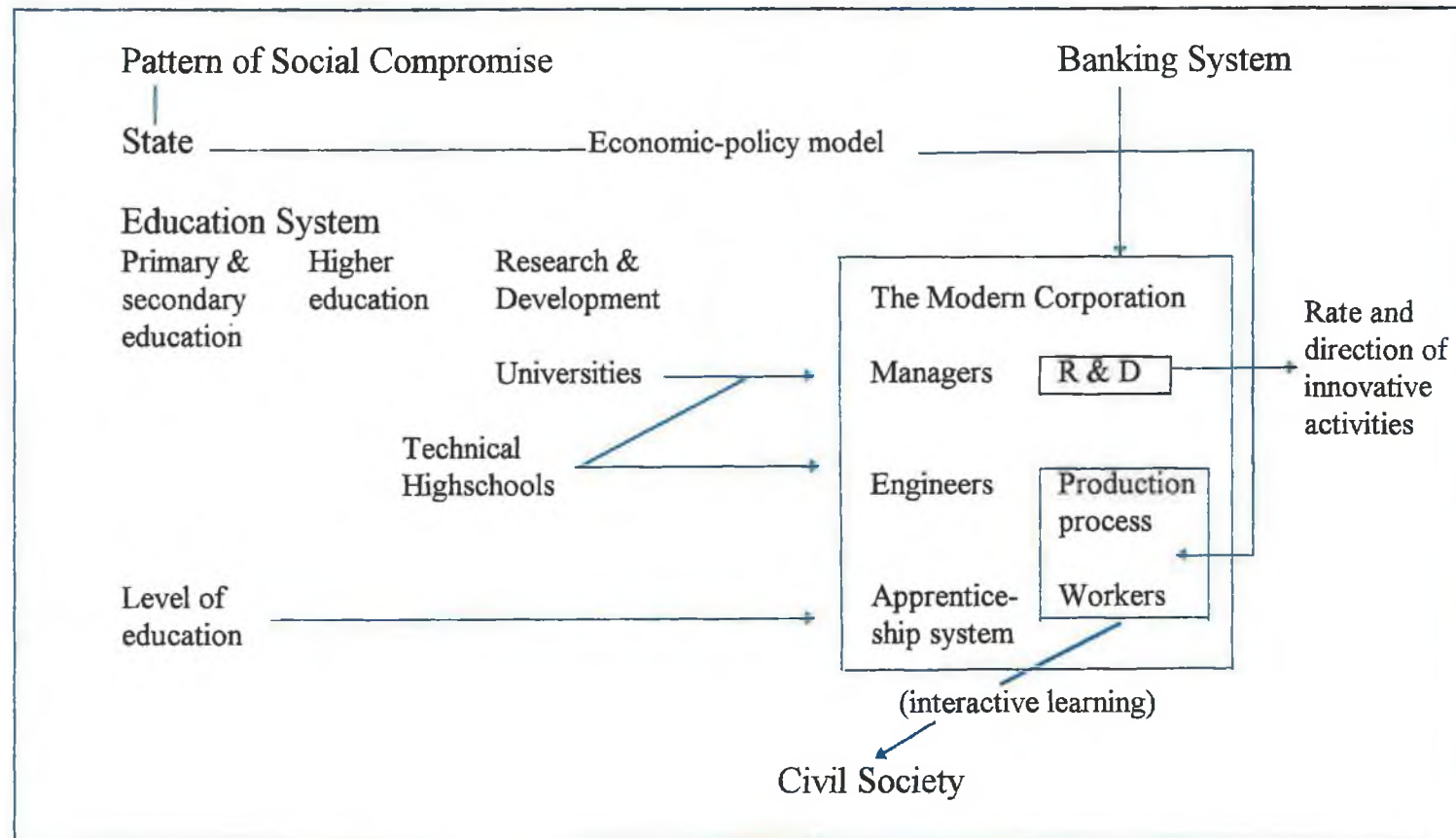
The NSI incorporates both the 'hard' factors, i.e. science and technology and the 'soft' factors, i.e. culture, the environment, education, institutional structures, etc., and thus is described as a 'holistic' system. As stated in Chapter One the NSI was defined by Mjoset (1992) as consisting of the institutions and economic structures which affect the rate and direction of innovation. He places the modern corporation at the centre of his system with importance given to educational attainment, the role of the State, the banking system and the civil society (see Figure 3.1).

A similar definition of the NSI is provided by Circa (1994, P.36) which states that;

The NSI is the collection of all institutions and mechanisms (public and private) that interact to stimulate and support innovation in products, processes and systems within the national economy.

Diagrammatically (see Figure 3.2), science, technology and innovation fulfill a central role with enterprise, government research institutes, the public sector and the universities and higher education system forming the major components around them. Circa (1994, P.42) state that "the image is meant to convey a sense of dynamism - as opposed to stasis - around a hub of effective STI policy..". As this conceptual map (Figure 3.2) represents what they believe the Irish NSI might aim to be it will be returned to at a later date. Notably, both omit the presence of entrepreneurs and Circa also omits vocational education.

Figure 3.1 A Sketch of the National Innovation System.

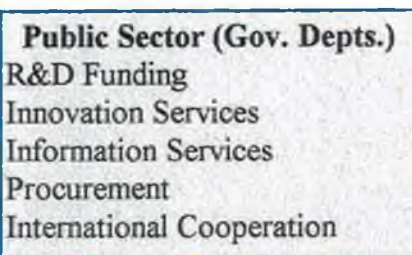
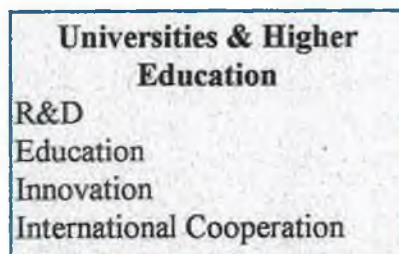
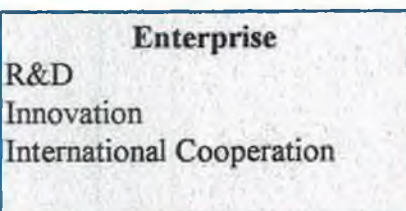


Source: Mjoset, 1992.

Figure 3.2 National System of Innovation



Source: Circa, 1994



3.1.1 National or Regional

An earlier definition from McKelvey (1990, P.20) stated that;

NSI is a broad term which includes the process of innovation and its diffusion, as well as social and economic growth.

She addresses the common problem of whether a regional, national or international approach should be taken, highlighting that 'nationhood' has been an important feature of the twentieth century in 'shaping the framework of society'. As political integration of the EU continues, the more forward looking nation must accept the increasing importance of regions and look for a balance between maintaining national pride and identity and recognising the economic realities of being a region within the EU.

The STIAC Report (1995, P.52) identifies certain elements that it believes would be present in some form in every NSI. They are:

- a strong national research system,
- education (specialised training of research personnel, general education for the application of new knowledge and the formation of attitudes conducive to risk-taking and creativity),
- close interaction and co-operation between all sectors (research, education, business and the public sector),
- efficient mechanisms for transfer and dissemination of knowledge and know-how and,
- an innovation culture.

The Report discusses how the innovative capability of a nation could be best developed and calls for an increase in networks, linkages and co-operation between firms and industrial organisations. In turn it accepts that the regional/local level is best suited to encourage and stimulate such co-operation. The Green Paper on Innovation (EC, 1995, P.45) states;

The local or regional level is, in fact, the best level for contacting enterprises and providing them with the necessary support for the external skills they need (resources in terms of manpower, technology, management and finance). It is

also the basic level at which there is natural solidarity and where relations are easily forged.

The Green Paper recognises the importance of SME's and identifies the regional level as the most suitable to encourage innovation within these firms.

Inter-firm co-operation due to its social nature has taken many different forms in the EU often transcending national borders and it is generally accepted that regional sub-systems co-exist within national systems (OECD, 1992). Therefore, while Lundvall, Mjoset and Circa, for example, talk of the NSI they are in essence talking of components and processes that appear to be more successful at a local/regional level, working within an EU and national system. Porter (1990) believes the competitive advantage of nations is created at home. He places great emphasis on the development of clusters and stresses the importance of competition and inter firm-rivalry as the spur to innovation. The next logical step therefore, not taken, however, by Porter, is one towards the stimulation of such clusters and the establishment of a support mechanism for the actual firms at the local level. A NSI is only as successful as its constituent parts, i.e. its Regional Systems of Innovation. Germany is not economically prosperous nation wide but rather particular regions have achieved success, albeit within a structurally sound national environment.

Having presented various definitions and views about the NSI the importance of the national level as the foundation of innovation has not been disputed. It represents the structure from which the development process can take place and where this analysis of Ireland must begin.

3.2 INDUSTRIAL DEVELOPMENT POLICY IN IRELAND

In the midst of a world wide recession the small open economy of Ireland, a nation with a population of 3.5 million people, has been dubbed the 'Celtic Tiger'. Ireland boasts the best performing economy in Europe at the present time, and of standing as a role model for the rest of Europe. Certainly, the economy of Ireland does appear to have achieved remarkable successes over the last number of years, with the growth in GNP

during the period 1992-1995 averaging 4.4 per cent per annum compared to a European average of 1.5 per cent over the same period (Forfás, 1996). Inflation has remained low at approximately two per cent with projections that it is likely to rise to 2.5 per cent in 1998 (ESRI, 1997a), the balance of payments is experiencing a substantial surplus - 8.6 per cent of GNP in 1993 compared to a deficit of 14.6 per cent of GNP in 1981 (McAleese & Hayes, 1995) - and the annual fiscal deficit is now one of the lowest among the EU Member States (Forfás, 1996). The standard of living has risen significantly, and since joining the EU in 1973 average GDP per capita has risen from 60 per cent to 99.3 per cent of the EU average in 1996 (NESC, 1997). It appears that the rapid growth of the Irish economy is set to continue with projections that growth of around 5.5 per cent a year should be experienced during the second half of the 1990's (ESRI, 1997c).

In 1987 Ireland faced a national debt of £25 billion, coupled with high unemployment and emigration. The Government took action by formulating, in conjunction with the social partners, the Programme for National Recovery in October 1987. This proposed sharp cuts in government spending, tax reform and agreements on pay increases. This has been followed by two further National Development Programmes based on the partnership approach. The current Programme runs from 1994-1999 and its two central objectives are;

- to ensure the best long-term return for the economy by increasing output, economic potential and long-term jobs,
- to re-integrate the long-term unemployed and those at high risk of becoming so into the economic mainstream (Collins & Walsh, 1995, P.1-249).

The favourable economic figures discussed above have been achieved within the framework of these two latter programme periods and prospects for the remainder of the current programme look promising.

On closer examination, however, discrepancies begin to appear, most prominently in regard to the relationship between GDP and employment. The fact that an above average growth in GDP in Ireland over the last fifteen years has been accompanied by a well-below average increase in employment remains as the major paradox of current

economic policy (O'Hagan, 1995). Ireland like most other European countries has suffered losses in employment in the agriculture and manufacturing sectors, while experiencing a rise in service employment, especially since the mid 1980's. Again, similar to other nations, a large proportion of this employment in services has been taken up by females who often are not only low paid but increasingly part time. These sectoral shifts had not been sufficient to offset a rise in unemployment and consequently the Labour Force Survey estimates reveal that the number unemployed almost trebled between 1979 and 1993 (Walsh, 1995). However, employment has been growing strongly in the past three years and the phenomenon of jobless growth on a continuous basis has not been validated as unemployment is now falling despite decreased emigration and increased in-migration. In 1995 the unemployment rate stood at 12.2 per cent, in 1997 it is estimated to be 10.3 per cent and it is projected to fall to 9.7 per cent in 1998 (ESRI, 1997a).

While exports from Ireland in 1996 were expected to near £29 billion it was estimated that only 14.5 per cent would be produced by Irish manufacturers (Flynn, 1996), a figure that may be further reduced due to the current beef crisis that is affecting Europe. Also, the recognition of the continuing dependency on Britain for Irish exports raises the topical question of whether Ireland should enter a single currency system without Britain's participation.

It is important, however, that recent economic performance is not overstated (ESRI, 1997b) and commentators warn of the inevitable downturn that will occur in the economic cycle if the market has not been liberalised in the mean time and that;

..the impact on unemployment will be as severe as that which we saw in the 1980's and more unfortunate people will become long term unemployed (McDowell, 1996, P.4).

In the remainder of the chapter, attention will first turn to the historical development of industrial policy. This will be followed by a description of the existing industrial development agencies, their roles and functions. In turn, major elements of the Irish National System of Innovation will be discussed, including R&D policy and the amount

of R&D undertaken by firms in Ireland, education policy and perceived barriers to innovation in Irish firms. This chapter aims to examine the direction industrial policy has already and is currently taking and to determine whether the most appropriate strategy is being adopted.

3.2.1 Industrial Development since the 1950's

The beginnings of Irish industrial policy may be traced to the foundation of the Institute for Industrial Research and Standards (IIRS) in 1947, the Industrial Development Authority in 1949, An Coras Trachtála, the state export promotion agency in 1952 and Gaeltarra Eireann (Údarás na Gaeltachta) in 1957. These developments culminated in the country's 'First Programme for Economic Expansion 1958-1963', which advocated a move from import substitution to export-oriented manufacturing. Agricultural and environmental research was initiated through the establishment of An Foras Taluntais (AFT), The Agricultural Institute, in 1958 and An Foras Forbartha (AFF), The National Institute for Physical Planning and Construction Research, in 1964.

Due partly to the upturn in world trade and partly to the new political leadership of Lemass and the dynamic economic policies followed, Ireland achieved a trebling of the previous growth rate of one per cent per annum between 1958 and 1963 (Bannon, 1989). Wiles & Finnegan (1993) believe the underlying accumulation from 1950 to 1958 of institutions, legislation and policies provided the foundation for rapid economic growth during the 1960's. The three main elements of the First Programme for Economic Expansion were;

..the introduction of substantial capital grants and tax concessions as a 'carrot' to encourage export-oriented manufacturing, the inducement of direct investment by foreign export-oriented manufacturing enterprises in Ireland, and a transition to free trade" (O'Sullivan, 1995, P.364).

O'Sullivan (1995) continues that the framework for industrial policy set out in Economic Development - the study which formed the basis of the first programme - was

to remain in place until the middle of the 1990's highlighting that this was, and remains, an acclaimed and historic document.

The 1960's is marked by the establishment of the National Science Council (NSC) in 1967 arising from the recommendations of an OECD Report published in the previous year, and the creation of eight Regional Development Organisations (RDO's) in 1969, following the Buchanan Report in that year, which were charged with the co-ordination of programmes for development in each region. The RDO's had no statutory basis and were abolished in 1987.

The failure to comprehend the importance of regional economies in Ireland was heightened by the entry of Ireland to the EU in 1973. Bannon (1989, P.150) captures the paradox of how Ireland now sought to remain classified as a single region within the EU as;

In having Ireland declared as a single region for the purposes of European Regional Development funding, the emphasis was to shift from internal regional disparities to a priority of bringing Ireland as a whole into line with the rest of Europe.

In 1978 following a further OECD review the remit of the NSC was extended and the new enlarged body was statutorily established as the National Board for Science and Technology (NBST) with responsibility for the development of science and technology in Ireland. The Institute for Industrial Research and Standards (IIRS), which had undergone a reform in 1961 with the objective of providing a wider range of services to industry, was amalgamated with the NBST in 1987 to form EOLAS, the Irish Science and Technology Agency.

In the midst of these organisational changes Regional Technical Colleges (RTC's) were established in 1968 to provide education and training for the trade and industry needs of the regions. This was followed by the establishment in the 1970's of specifically business and technology oriented third level colleges in Limerick and Dublin, which

were subsequently designated as the University of Limerick and Dublin City University, respectively.

The Telesis Report entitled 'A Review of Industrial Policy' was published in 1982 and criticised the overemphasis on foreign industry, a strategy that it believed would not succeed in generating long-term economic growth. It recommended the achievement of sustainability through an internationally competitive indigenous base. However, the main policy adopted from its recommendations was the generally acknowledged misguided one of 'picking winners', instead of providing support for all indigenous firms through strong support mechanisms

It was a decade later in 1992, when the Culliton Report entitled, 'A Time to Change: Industrial Policy for the 1990's, and the NESC (National Economic and Social Council) Report undertaken by Lars Mjoset and entitled, 'The Irish Economy in a Comparative Institutional Perspective' were published.

Culliton (1992) highlighted widespread structural problems and believed that a broader approach in the formulation and evaluation of policy for industry was required, with areas such as taxation, infrastructure, education and training covered in the report. Mjoset (1992) places Ireland's development within a basic vicious circle which has occurred principally due to a weak national system of innovation and through population decline via emigration. The importation of foreign entrepreneurship and the loss of entrepreneurs through emigration were identified as contributory factors in the weak development of indigenous industry. Both Culliton (1992) and Mjoset (1992) advocated a policy move towards the fostering of clusters and the consolidation of development blocks based on areas of national advantage. Culliton (1992), for example, described the 'over-emphasis on high-tech sectors' naming the food sector as an area that required development.

The Government responded the following year with its publication 'Employment Through Enterprise'. However, it thought that clusters could be created by central direction and the only prominent action taken, as recommended by the Culliton report,

was the amalgamation of EOLAS and the IDA, resulting in the establishment of three separate agencies with responsibility for industrial policy and its implementation. These are, Forfás which has responsibility for industrial and technology policy formation, Forbairt which is responsible for the development of indigenous industry and IDA Ireland which is responsible for the attraction of overseas industry to Ireland.

The STIAC (Science, Technology and Innovation Advisory Council) Report (1995) reflected a whole new focus on science and technology policy an area which had failed in the past to receive government commitment. The emphasis which the Report (also known as the Tierney Report) placed on the development of a strong Irish NSI has already been referred to (see P.56), and it will be discussed later in relation to technology policy.

In the same year Cooke (1995) undertook for the NESC a study entitled 'Enterprise Support Policies in Dynamic Growth Regions in Europe'. He concludes that there is no strong evidence that Ireland has an integrated NSI and calls for the promotion of a co-operative ethic in the country. While he questions Culliton's recommendation of intervening to build clusters he then promotes networking as a policy measure, aimed at the indigenous manufacturing sector. He called for a Network Co-operation Programme based on the Danish Network Programme and a pilot programme was subsequently launched at the end of 1996. Similarly however, caution must be exercised in any public attempt to create networks which are by nature very complex, time-consuming and socially embedded in their particular settings.

The following year Forfás (1996) published a policy document entitled, 'Shaping Our Future: A Strategy for Enterprise in Ireland in the 21st Century'. The core of the Report is based on the achievement of four key objectives which are,

- to more than half the rate of unemployment to approximately 6 per cent by 2010,
- to reduce the number of long-term unemployed from 127,000 in 1995 to no more than 50,000 by 2010,
- to increase living standards, in terms of GNP per capita, to achieve average EU-15 levels, and

- to raise the quality of life of all of those living in Ireland.

(Forfás, 1996, P.11)

These projections are based on the achievement of growth of five per cent per annum for the next fifteen years. There is still much to be learned from the document Economic Development (1958) which stated;

But there is nothing to be gained by setting up fanciful targets. Failure to reach such targets would merely produce disillusionment and renew the mood of national despondency (cited by Wiles & Finnegan, 1993, P.78).

While the 1958 document accepted that its ultimate success or failure depended on the individual reactions of the Irish people, one commentator on the Forfás report was left with the impression that "it was produced by state agencies and aimed largely at other state agencies" (Stewart, 1996). Finally the Report talks much of 'actions' and 'measures' but gives no clear impression of what these may be or how they are to be achieved.

The first ever Irish White Paper on Science, Technology and Innovation was published in October 1996. Unlike most White Papers which normally mark the end of a discussion process and set out clear targets and policies, this Paper was presented by the government as a platform on which debate on the future of science and technology policy could be heightened.

While largely a discursive document the government took action, in response to the Tierney Report, in what it regarded as the 'more immediately critical areas', so that; the administration of third level research schemes has been improved, schemes such as the Techstart Programme, which helps companies make better use of technology by transferring knowledge through graduates with a technical background, and the Technology Audit Programme, which identifies opportunities within SME's which will enhance their development, have received extra funding, funding for basic research and PhDs has been increased and new funding has been provided for post-doctoral research. Taxation measures to encourage business R&D have been introduced, a scheme providing training for companies in R&D and innovation management has been

introduced, a programme encouraging firm networking is being piloted and a public awareness campaign will be funded (Department of Enterprise and Employment, 1996).

At present the State invests in the region of £780m per annum in science and technology related activities. The White Paper placed emphasis on its major theme of creating an innovation culture and on its main aim of first putting the necessary administrative structures in place. These administrative structures included the creation of a permanent Science, Technology and Innovation (STI) Council, the development of a new Inter-Departmental Committee to work with the existing Cabinet Committee for Science and Technology, and the establishment of the Programmes in Advanced Technology (PATs) as a subsidiary company of Forbairt. The new Science Council was established in March 1997 and has received strong criticism from industrial researchers who believe that it will become a 'talking shop' for academics due to the membership makeup of, six members from industry, two from semi-state bodies and twelve from third level institutions (Ahlstrom, 1997). The establishment of this Council alone may not be sufficient to ensure long-term commitment by the government to science and technology and to raise its perception in the public eye.

Thus, since 1992 six substantial policy documents have been published in the area of industrial and technology policy with the general consensus that Ireland has a weak NSI but with little concrete policy measures to address this situation.

Figure 3.3 illustrates the structure of the Irish Administrative Framework for Economic and Industrial Development and indicates the inter-relationships between its common elements. The functions of the various Government departments, state agencies and local bodies which comprise it are outlined in Appendix C.

EMPLOYMENT

Regional offices /
ships - 25 Trades

t Regional

5 County
enterprise
boards

3.2.2 Assessing the Public Role

The centralist structure of government in Ireland remains despite increasing recognition around the world of the potential benefits of greater local autonomy. In fact, the late 1980's and early 1990's witnessed the creation of a plethora of central agencies, some taking over functions previously under LA control.

At the regional level various divisions reflecting the needs of the individual organisation or department have taken place resulting in the existence of;

- 8 Regional Health Boards,
- 7 Regional Fisheries Boards,
- 6 Regional Tourism organisations,
- 10 Forbairt Regional Offices,
- 10 Fás Regional Offices,
- 11 Regional Technical Colleges,
- 7 Gaeltacht Regions (Donegal, Mayo, Galway, Kerry, Cork, Waterford, Meath),
- 8 Regional Authorities,
- Western Development Commission, and
- Shannon Development.

However this has not succeeded in achieving any real devolution of power as Collins & Walsh (1995, P.1-237) conclude;

All these regional structures follow the principle of being executive agents of the central department or agency, a means of central control of a unilateral activity rather than of devolution of authority.

Highlighting this mass of regional inter-twining, the recently established Mid-West Regional Authority incorporates the counties of Clare, Limerick, Tipperary North and Limerick City while Shannon Development, the established regional body in the area, holds additional jurisdiction over North Kerry and South Offaly. Finally there has been much recent debate over the roles of the new local bodies in relation to the overlapping of functions as, for example, Leader and the County Enterprise Boards are grant aiding similar types of projects (Matthews, 1995). Share (1992) quotes the view of Michael

Tunney, a staff member of SFADCo since 1989. He feels that the proliferation of agencies may prove to be counter-productive and in relation to the county of Kerry stated (P.18);

Shannon Development has responsibility for tourism in the North, Bord Fáilte in the South, the IDA functions in both sub-cantons, Údarás na Gaeltachta concerns itself with the Irish-speaking areas in the South, there is a County Development Team in addition to Tralee Borough Council, the County Council and the County Manager. Yet there is no formal mechanism permitting all these people to meet and exchange ideas, let alone initiate cohesive action.

The County Development team would now be incorporated into the County Enterprise Board. Also, today the county will have the additional presence of Area Partnership Boards, Leader Companies and Forbairt regional input. In order to improve the co-ordination of these agencies the County Strategy Groups were established which comprise the Local Authority, the County Partnership Board, the County Enterprise Board, Leader and the County Tourism Committee. The Forfás Report (1996) appears to have recognised that the recent spate of new development agencies can not practically continue and that these developments still have not resulted in any real devolution of power. It stresses that use should be made of the existing government structures, in particular LA's. This role of LA's was recently addressed through a Government report entitled "Better Local Government - A Programme For Change" (Department of Environment, 1996), which has the integration of the systems of local Government and local development by the year 2000 as its central feature.

Although a tentative approach it could represent the start of a whole institutional change in Ireland, one which looks more at the needs and capabilities of its people, that realises that continuous learning, the interaction and co-operation of people, the development of sophisticated adaptation skills and the development of a society built on mutual trust, begins at the local level.

3.3 ANALYSIS OF THE ELEMENTS OF INDUSTRIAL POLICY

The 'ideal' Irish National System of Innovation proposed by STIAC (1995) comprises (see Figure 3.2, P.58):

- The Public Sector - holding the roles of public procurement, the formulation of regulations and standards and the creation of programmes to facilitate technology transfer and diffusion.
- The Enterprise Sector - required to undertake organisational innovation, inter-firm networking and cooperative R&D.
- The Research System - including higher education and public institutions and stressing the importance of universities in servicing R&D needs.
- The Financial Sector - requiring innovation funding initiatives.
- Other Components - relating to education and training elements.

The system, due to its very nature, focuses strongly on third level research and technology transfer capabilities and must not be regarded as the way forward in the development of industry in general in Ireland. For this, a balance between policies for 'high-tech' and traditional industries must be achieved.

While the Irish economy appears to be in a relatively healthy state the National Economic and Social Council (1993, P.46) believes that the competitive achievements of Ireland are seriously flawed in two main respects:

1. This high performance is unevenly distributed between the external and indigenous sectors.
2. The extent to which the social benefits of inward investment exceed the costs may not be large.

These two areas will thus be addressed in the following sub-sections.

3.3.1 R&D in Irish Industry

Recent findings in relation to R&D undertaken in industry in Ireland include:

- R&D expenditure in foreign owned companies has grown at a rate of 23 per cent per annum in real terms since 1988 compared with 8 per cent in the indigenous sector (according to Forfás, if 50 per cent or more of the company's equity is held by Irish residents, the company is classified as Irish/indigenous.), and that the core group of 300 Irish firms that account for the bulk of R&D spending has not increased in number greatly since 1991 (Forfás, 1993).
- Only one in three manufacturing firms in Ireland from 1990 until 1992 could be described as innovative (Forfás, 1994).
- A form of 'duality' exists whereby foreign firms are twice as skilled, productive and committed to R&D than their indigenous counterparts. Multi-national corporations in Ireland account for 17 per cent of the total number of manufacturing firms, 45 per cent of employment, 68 per cent of net output and 63 per cent of BERD (STIAC, 1995).
- Since 1981 the share of manufacturing employment accounted for by Irish-owned firms has decreased from 62 per cent to 54 per cent and the average profitability of Irish-owned industry has not improved since 1988 (Forfás, 1996a).
- Business expenditure on R&D has risen from £271m in 1993 to £397m in 1995, with foreign-owned companies accounting for two-thirds, £258m, of the total (Forfás, 1997).

However, it is often the case that conventional statistics do not register the research and development that is taking place on a more informal basis in small firms which do not have a structured research and development department. Likewise these conventional statistical approaches may overstate the level of research and development that is being undertaken by MNC's in Ireland. Often the Irish branch plants are simply involved in process improvements while the bulk of fundamental research is undertaken at the headquarters. Indeed Forfás (1997) notes that foreign-owned companies seem to be as likely to be in need of development support as their Irish owned counterparts (see Figure 3.4).

Figure 3.4 R&D Performance in Irish Industry

Research Performers	14%	12%	20%
Technologically Competent	31%	32%	27%
Minimum Technological Innovation	25%	25%	25%
No Technological Innovation	30%	31%	28%
	All Firms	Irish-Owned	Foreign-Owned

The four groups are categorised using the following criteria:

1. No technological innovation - Proportion of all companies with 10+ employees in manufacturing or internationally traded services which did not develop or introduce any technologically changed products or processes and undertook no R&D between 1993 and 1995.
2. Minimum Technological Innovation - Proportion of companies with some mention of having undertaken R&D or developing changed products or processes but not operating at the level where they could be described as technologically competent.
3. Technologically Competent - Proportion of companies which undertook R&D or developed changed products or processes between 1993 and 1995 with at least one technically qualified employee per 25 employees or having continuous commitment to R&D but spending less than £100k on R&D in 1995.
4. Research Performers - Proportion of companies claiming to have a continuous commitment to R&D and spending more than £100k on in-house performed R&D in 1995.

Source: Forfas, 1997.

In general, however, the more innovative MNC's dominate the 'high tech' sectors such as electrical engineering and office and dataprocessing equipment, while indigenous firms predominate in the more 'low tech' timber and furniture, and printing and publishing sectors of the economy. Foreign direct investment is concentrated in electronics, engineering, chemicals and international service industries. These high tech sectors have an import penetration of over 80 per cent and an export intensity ranging from 83 to 98 per cent (O'Doherty & McDevitt, 1995). In comparison, the food, drink and tobacco sector at 21 per cent represents the top indigenous export (Flynn, 1996). Irish indigenous industry is sailing under the MNE's innovative and pro-active flag while in reality it is lacking in diversity and in quality of skills. It has been criticised for inadequate supervision and quality control procedures and for the inability of small Irish firms to provide both quantity and quality on time for European buyers (Flynn, 1996, NESC, 1993). While it is accepted in Ireland that high-tech firms need to undertake R&D this attitude has not transcended to the older mature Irish industries. Agriculture and the marine, the whole food, forestry and environmental protection sectors are seriously under funded and, compared to Denmark, "Ireland has little or no public investment in R&D in the country's indigenous resources" (STIAC, 1995, P.97).

The White Paper on Science, Technology and Innovation frequently mentions the limitations of state resources and the need to channel this into areas that will prove most productive. However, the specifics are not provided. Government support for R&D measures remains at 0.4 per cent of GDP compared to the EU average of 0.9 per cent (Forfás, 1996b). Though state support for technology for enterprise development has increased from £44m in 1990 to £94m in 1996, this would not have been achieved without the help of EU funds which contributed £264m or 32 per cent of the total EU funds for the Industry Operational Programme to RTD (Forfás, 1996b). Calls for planning for the post-1999 situation when it is expected that EU funding for Irish programmes will decrease illustrates the existing dependence on the EU structural funds.

Much criticism has followed the White Paper's third level research proposals and funding increases and the Royal Irish Academy has stated that scientific research in Ireland will "stagnate, atrophy and die" unless the government begins to fund it properly

(RIA, 1997, P.3). The White Paper's proposal to channel limited funds into areas that will prove most effective, largely at the expense of basic research, shows a short term commitment in an attempt to maximise gains, rather than a longer-term and real commitment through the increase of research funding. At present Ireland ranks among the lowest in the OECD in relation to the public funding of higher education research (Healy, 1997).

3.3.2 The Benefits of Inward Investment

In spite of the various reports calling for greater emphasis on indigenous industry, industrial policy is still geared towards the attraction of foreign industry. The Forfás Report (1996, P.31) states;

Overseas firms will continue to be a major source of employment and wealth creation in Ireland over the next fifteen years and beyond.

Despite the massive outlay in grants especially in the attraction of MNC's, the "net loss in total employment in the Irish industrial sectors in the period from 1973 to 1994 was 10,491 jobs" (O'Sullivan, 1995, P.368). Obviously it must be asked if this represents the most cost effective way to create employment in Ireland. Likewise the divergence between economic and social policy has been addressed by the Social Progress Index (SPI) which shows that between 1977 and 1994 there has been no real connection in Ireland between economic growth and social progress. While it shows that over the seventeen-year period Gross National Product grew by more than 68 per cent and Gross Domestic Product by more than 80 per cent, the Social Progress Index grew by less than one per cent (Clarke & Kavanagh, 1996). This report supports the idea that GNP and GDP do not adequately reflect the actual condition of the nation, a point clearly visible in the escalation of social problems in Ireland.

Therefore, although Ireland can boast high economic growth rates this is not reflected in the social development of the nation which one must also remember has had the benefit of EU Structural Funds. In assessing the impact of Structural Funds spending on the Irish economy from 1989-1993 the ESRI estimated that;

..the long-term supply side-effects of the EU aid element will build up over a period and will raise the level of GDP by 0.8 per cent and GNP by 1.1 per cent by the year 2,000. The short-term demand side-effects of the resources made available by the EU raised GDP by 2.5 per cent and GNP by 3.5 per cent in 1993 (Irish Business Bureau, 1995, P.4).

Through the Community Support Framework (CSF) Ireland received an allocation of £5 billion to be provided by the four Structural Funds (ERDF, ESF, EAGGF-Guidance Section and FIFG) over the years 1994 to 1999, concentrating on four priorities - the productive sector, economic infrastructure, human resources and local, urban and rural development (Irish Business Bureau, 1995).

It is now established that the Irish problem is an innovation one where the "concentration on FDI resulted in a neglect of the local industrial base and indigenous science and technology innovation" (STIAC, 1995, P.41).

While FDI can be beneficial in the correct environment the almost exclusive use of it, as in the Irish case, festers many long term problems. Dalum (1995, P.203) on describing Ireland's NSI states how it has;

..mainly been characterised as a host country for foreign MNC assembly and chemical plants, and no significant technological innovation capability appears to have emerged in Irish manufacturing.

Technological spillover to the Irish NSI has not occurred to any great extent (Dalum, 1995), and the skill level of the Irish labour force has not been raised significantly (Mjoset, 1992). A shortfall is evident between the jobs expected to be created from FDI and the reality (Culliton, 1992), raising the question of whether value for money is being obtained for the outflow of grant aid.

3.4 EDUCATION AND TRAINING

The review of the Irish education and training system in Ireland by the Culliton Report (1992, P.9) stated that;

Despite its enviable academic standards, the Irish education and training system has serious gaps when it comes to technical and vocational education and providing for the intermediate production skills that are crucial to industrial productivity. Management training is also underused.

The Report was critical of the role of FÁS, the national training body, stating at the time that 90 per cent of the FÁS training budget fell better under the heading of unemployment support and called for a complete institutional reorganisation of the agency (Culliton, 1992). In the same year Sweeney (1992) agreed that too much emphasis was placed on the academic to the detriment of the technical. Only 23 per cent attend the vocational school system while 73 per cent of the youth finish education, according to Sweeney (1992), lacking the skills and knowledge suitable to remain and work in Ireland leaving emigration as the only option.

Similarly the NESC (1993) Report on Education and Training Policies stated the underlying policy objectives as:

- a commitment to equality and opportunity,
- a common concern with the curricular content of education,
- the academic / vocational balance and
- the efficiency of the education system.

The Report (1993, P.8) admitted however that;

Research throughout the 1980's has constantly pointed to the continuing inequalities in the educational system and to the inadequate provision of vocational education and training.

Ireland provides an inflexible education system, gives low priority to the training and retraining of employees and its management lacks marketing expertise (NESC, 1993). Some indigenous Irish clothing companies, for example, are making European copies rather than innovating, designing their own products and entering a niche market. The Green Paper on Innovation (EC, 1995) places great emphasis on human resource development and refers (p.25) "to the poorly adapted education and training systems to

the needs of a changing world". The paper conveys the picture of innovation in a 'strait-jacket' where courses are too compartmentalised thereby choking innovation.

All knowledge cannot be generated from within and while it has been recognised that Ireland can benefit from openness to outside influences and information the country must first possess highly skilled specialists that are capable of absorbing it (STIAC, 1995). STIAC, as noted, places great emphasis on the research and higher education sectors discussing in detail the latest venture that of the Programme in Advanced Technologies (PATs). This aims to enhance the performance of Irish industry through technology transfer activities in selected new technologies areas and will be returned to in Chapter Six. Expenditure on research in higher education colleges in 1993 was £73 million and represented a real increase of 200 per cent for the period 1982 to 1992 (Forfás, 1995). However, as identified earlier this is not sufficient to permit the needed level of research in the country. Compared with international standards Ireland rates highly in relation to linkages between its universities and industry although there is an acceptance that a lot more is required. STIAC and the PATs are following the popular and more prominent line of encouraging research and investment in the high tech sectors. However technologies that could transform Irish indigenous industry are being ignored. The agricultural, fishing and textiles sectors are not obsolete in this age of high technology, they are simply using obsolete methods compared to, for example, their successful Danish counterparts.

Recent changes announced by the Department of Education in relation to third level institutes includes, the granting of degree awarding powers to the Dublin Institute of Technology and the upgrading of Waterford RTC to an Institute of Technology. Quinlan (1995) notes how it is evident that regions with universities perform better than regions without.

A new standards-based apprenticeship system has also been put in place in Ireland following a review of the old time-served apprenticeship system, where the achievement of standards was not obligatory and where it was identified that the system was inflexible and that the curriculum was out of date. The new system makes education

mandatory and while the new model (based on the German apprenticeship system) has been welcomed by industry and education representatives, its management and organisation by FÁS has been weak. Comments from the Construction Industry Federation and the School of Trades in the DIT have included respectively that, FÁS, due to other pressures has insufficient time to spend on the new system and, that the employers are not sufficiently committed to training (Byrne, 1997).

Education must not simply be about providing technical experts in the field of software and chemicals and success must not be measured through the number of industry/university links that can be created. Certainly these are important but the essence of creating a skilled and innovative work force is much closer to home. It requires a whole cultural change about the way education in this country is viewed, placing more emphasis on individuality, on creativity and competency, possessing both the technical and academic skills to do an 'expert job, rather than an expert in a particular field' (Sweeney, 1992).

While strength in 'high tech' depends on the availability of university trained people, industry more generally requires a supply of literate, numerically competent people in a wide range of functions outside of R&D, who are trained to industry demands either by the firms themselves (as in Japan) or in external training systems linked to firms (as in several German and Swedish industries) (Nelson, 1992, P.359).

Ireland must ensure that it does not move from 'glorifying the academic' to glorifying the high technology sectors and fail to capitalise on the real potential of its indigenous and more traditional industries. To this end both the importance of vocational education and in-house training needs to be accepted in Ireland.

3.5 PROBLEMS ENCOUNTERED BY IRISH INDIGENOUS FIRMS

The principal perceived barriers to innovation in Irish SME's were identified by Cooney & O'Connor (1995, P.7) as, high risk, high cost and financing problems and a lack of skilled personnel.

Irish firms are subject to high rates of income tax and PRSI, and low availability of venture and loan capital. A recent EU study of Ireland placed the absence of a responsive financial system at the top of impediments to innovation and Circa (1994) believe that the existing commercial venture funds are so risk averse that the term 'venture' should be deleted.

Other industry opinions included:

- the risk attached to R&D is so high that government must provide active support,
- incentives are not focused enough on the sectors that need to increase their R&D capability, i.e. the SME sector as opposed to aiding MNC's,
- too much bureaucracy is involved in different schemes and initiatives and
- the focus of government support is biased in favour of research rather than development (Forfás, 1993, P.27).

While it is essential that Ireland moves from its "unhealthy dependency mentality" (Culliton, 1992) both on central government and the EU, government support is still essential but needs to take on a whole new direction. Undoubtedly increasing the availability of R&D funding would prove beneficial but unless the smaller indigenous firms are able to access this support real progress will not be made. However the increase in funding for the Forbairt run Techstart Programme for example, illustrates a positive step by the Government in the development of indigenous SME's.

The establishment of special venture capital funds for industrial growth is a key feature of the Nordic countries which are also strongly proactive in the area of technology transfer and diffusion and these are crucial paths for Ireland to follow.

By concentrating on the high tech sectors and pharmaceuticals, our system has not been built on pre-existing strengths or natural advantages (Circa, 1994) and it is thus not surprising that linkages, until recently, have been disappointing.

A nation cannot import a whole set of high tech industries and automatically be capable of jumping the technology gap both to supply their needs and to possess the knowledge and technology to enable the development of spin off industries in what is obviously unfamiliar territory. Ireland is today faced with shortages in certain high-tech industries and while the nation strives to train graduates to meet these needs dependency grows on what are mainly foreign-owned firms.

3.6 AN INNOVATION CULTURE

Policy advisors strenuously advocate the existence of a strong research and education system, close co-operation between all actors and efficient mechanisms for the transfer and dissemination of information as the elements of a successful NSI. Often left to one side though is the existence, or not, of an innovation culture where every person is prepared to strive for continuous improvement in the tasks that they face. STIAC (1995, P.149) state that;

The aim should be to bring about a significant cultural shift in attitudes and to bring about better communication, interaction and mutual understanding between the scientific community, industry, government, the media and the public.

Prominent in Irish society is a culture averse to risk, a culture that seeks security and is directly detrimental to the growth of innovation and to the development of entrepreneurial activity. Cooney & O'Connor (1995, P.8) identified the following public attitudes that inhibit innovation:

- a general tendency among Irish people towards jobs with security rather than entrepreneurial risk-taking,
- a general tendency among Irish people to resent successful entrepreneurs and
- the way in which the education system influences young people towards getting a job rather than starting a business.

There appears to be a 'deep-rooted prejudice' against failure in businesses but until people in Ireland are prepared to take risks and to be rewarded for their courage and ingenuity progress will only be modest (Culliton, 1992). This self-confidence however originates right within oneself from one's identity. We must understand our own uniqueness first, build on these strengths and, in turn, become more sensitive to others' different needs. Strength and sensitivity are today's requirements for success.

Bradley (1996, P.23) states that "the broader social and cultural context driving entrepreneurship is seriously underestimated". He continues;

The Scandinavian nations, with languages that are spoken by no one but themselves, have been world leaders in innovation and design. Their sense of uniqueness binds the Danes together, for example, and motivates them while their sense of difference means they are actually aware of cultural and linguistic differences in other markets and countries (Bradley, 1996, P.23).

The Irish economy holds many contradictions from its jobless growth and the continuing concentration on foreign multinationals, often at the expense of its indigenous base, to a strong agreement with EU regionalisation policies while the home nation remains highly centralised. Local and regional bodies created in recent years have helped to alleviate the latter but real devolution has not been forthcoming. This centralised, Catholic society not only resulted in a weak local government structure but allowed for the emergence of clientelism with politicians creating the 'illusion of assistance' (Mjoset, 1992). All this has not been conducive in creating an environment of equality, mutual respect and co-operation from which society would have the confidence, the encouragement and assistance to innovate.

3.7 CONCLUSION

Great interest now exists in the whole process of innovation with present theorists attempting to understand and create their own NSI. While this chapter has argued about the viability of a national system having the capability to cater for each locality in its domain, the need for a sound national infrastructure to support the innovation process is unquestioned.

On discussing the Irish NSI the major characteristics were as follows;

- the performance is unevenly distributed between foreign and indigenous firms,
- there is an over concentration of foreign direct investment and few linkages have been established with the indigenous sector, although this is improving,
- the education system is highly academic and the skill level has not been increased to any great extent under foreign influence,
- there is little or no perception of science, technology and innovation in the country and it is subject to fluctuations in government commitment,
- there appears to be a concentration on high tech industries to the detriment of more traditional industries and the indigenous sectors are suffering from a serious lack of funding,
- there is still an over-dependence on the British market for Irish exports, and
- there is a tendency among the Irish towards jobs with security rather than taking the riskier entrepreneurial direction.

Looking back on the development path it appears that the opportunities of the 1960's were missed when for a time, economic and social policy were closely linked, local input was encouraged and a great enthusiasm surrounded the whole concept of planning and of what Ireland could achieve. This opportunity was lost due to many reasons but primarily due to the lack of institutional reform that would have given more power to the regions. Policy has become more and more centralised. New agencies are still being formed that take more responsibility from the Local Authorities. A spate of local and regional bodies have been created in recent years and while some of this can be attributed to EU pressure it appears that Ireland is recognising the importance of local input although the delegation of real control of affairs to local level remains an aspiration.

A real commitment by both government and industry to research and development, in both high tech and traditional industries, an increased recognition of the importance of vocational training and an effective apprenticeship system and a promotion of indigenous ideas over the attraction of foreign firms is required. Promoting the development of clusters and networking is of little use if indigenous industry is not

present in sufficient numbers and if a firm is networking with unsophisticated counterparts. The basic building blocks, that is the presence of entrepreneurs and new firm start ups, must first be put in place before the stimulation of various agglomerations becomes central to state industrial policy.

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CHAPTER FOUR
REGIONAL INNOVATION - THEORY
AND PRACTICE

4.0 INTRODUCTION

Regional policy is no longer seen solely as the reduction of interregional disparities and increased emphasis has been placed on its role of promoting growth throughout an entire country based on the achievement of regional self-sufficiency (Prud' homme, 1995). Von Meyer & Muheim (1996, P.24) describe how regional unemployment rates among OECD countries, on average, differ more than 30 per cent from national rates, in some countries more than 60 per cent, and they contend that "national averages may thus hide more than they reveal". Indeed it is being accepted that disparities within regions are as important as those between them.

The strong regional policies of the 1960's and 1970's throughout Europe were largely top down in nature and in retrospect it is evident that the reliance on centrally induced growth and development strategies failed to provide a solid framework for sustainable regional development (Malecki & Todtling, 1993, Coyle, 1996). Cooke (1995, P.4) thus notes that;

..it seems likely that the hierarchical, structured, divisionalised, compartmentalised, bureaucratic mode of organisation and economic co-ordination is in retreat as a model of best practice.

Current models of best practice place emphasis on the mobilisation of endogenous regional resources (Maier, 1995), and on the belief that different solutions are required for different regions and that by making decisions at a local level more appropriate strategies will be found (Hilpert, 1991a). Decision making processes at regional level are in place in virtually all the EU member states and today regions represent an integral part of the European culture of subsidiarity, devolution and community self-help (Forfäs, 1996a).

The complex inter-relationships and intricacies of the innovation process has raised doubts about the ability to successfully analyse it at national level and today the regional level is regarded as being better able to show the inter-connectedness of the various players (Cooke, 1995). Co-operation, mutual trust and informal linkages form the new

framework on which sustainable regional development may be achieved. Co-ordination, both horizontal and vertical, hard (roads) and soft (information, education and training) infrastructure and the provision of research institutes form the direction that policy is taking in the attainment of strong regional innovation.

The importance of social issues, both in the stimulation of innovation and as a direct beneficiary of increased economic activity, is gaining more recognition and Von Gleich (1995, P.2-40) states how, "future technology policy and planning will incorporate the whole society in a more democratic approach". In fact, the relationship between technology and society has become a major issue of the 1990's regional policy objective, which remains as the raising of economic and social conditions of all people in all regions (Malecki & Todtling, 1993).

While Chapters Two and Three touched on institutional changes that have identified regions and their agglomerations (industrial districts, milieux) as the source of real development, this chapter will look in detail at the more recent concept of "Regional Systems of Innovation" (RSI). Definitions, diagrams and the actors and factors that serve in the formation of a RSI will be discussed and the cultural influences that impact on such a system will be addressed. Such theory will then be used in the examination of the Irish local government system. The need and practicality of RSI's in a small nation such as Ireland will be evaluated, and weaknesses in the present administrative system will be discussed.

In total, this chapter will discover the role, if any, that a Regional System of Innovation could play in Ireland and, the factors that would need to be addressed to facilitate its creation.

4.1 REGIONS IN EUROPE

A single universal definition of what constitutes a region has not been achieved largely due to the conflict between the concept of space and its geographic expression. Keane (1995, 1-50) states that;

Considerable effort has been made to develop a single, consistent set of criteria for defining regions. However, it is not clear that general criteria can be developed independently of the issue or problem under discussion. For some purposes geographic, or administrative, regions suffice; for others, regions may be defined on the basis of resource allocations, transportation networks, income levels, ethnic groupings, the nature of economic activities or institutions, physical attributes such as river basins, or any number of demographic, sociological, physical, or other characteristics.

Keane's socio-economic, administrative and physical characteristics can be expanded to include internal networks and inter-relationships which have directly contributed to the development and sustainability of regions throughout Europe.

Cooke, Boekholt, Schall & Schenstock (1996) list four wide criteria for defining a region. They are (P.2);

1. A region must not have a determinate size.
2. It is homogenous in terms of specific criteria.
3. It can be distinguished from bordering areas by a particular kind of association of related features.
4. It possesses some kind of internal cohesion.

They further postulate, that the boundaries of regions are not fixed resulting in the emergence of new regions and the disappearance of others.

The definition of a region for the purpose of this thesis lies in-between the recognition of 'related features' and 'internal cohesion', and the need for administrative boundaries that focus concentration on an area which has its own industrial and social development bodies and groups. What must be taken from the above definitions is the fluidity of regions across each other's boundaries and the corresponding need for flexible institutions that will be prepared to work for the development of a new region that may

incorporate sections of two previously separate regions. Co-operation not only within but between regions transcending existing boundaries is required. Thus, a region will be defined here as a varying geographic, social, cultural, historical and economic administrative entity, which to remain sustainable must accept and welcome future changes across all criteria.

4.1.1 The NUTS Classification System

Due to practical needs in the implementation of regional policy and in the collection of data in the EU, the 'Nomenclature of Territorial Statistical Units' (NUTS) was established. The NUTS regions form a three-level hierarchical classification with NUTS Levels 1 and 2 comprising aggregations of the Level 3 regions. There are 77 regions at the NUTS 1 level, 206 at the NUTS 2 level and 1,031 regions at the NUTS 3 level. Ireland is one of the regions at NUTS 2 and the eight regions within the country (sub-regions in an EU context) are at the NUTS 3 level (see Map 4.1). Although the NUTS system has tried to ensure that regions of comparable size are at the same NUTS level, each level will contain some regions which differ greatly in terms of area population and administrative power (Keane, 1995).

It is unrealistic to compare a region such as Baden-Wurttemberg (NUTS 1 level), with a population of over 9 million, to a region in Ireland (NUTS 3 level) which has an average population of over 300,000. Indeed on this basis many would overlook the need for a regional structure in Ireland. However, on closer inspection, it is found that Baden-Wurttemberg is sub-divided into four economic districts and twelve planning regions. Fitzpatrick Associates (1997, P.3) notes that "the Irish NUTS 3 regions are broadly similar to the average figure for all EU regions in this class" (see Table 4.1). However, the degree of power held by the Irish regions is considerably less than that found among other regions at the NUTS 3 level in Europe. The Danish county level, for instance, holds a wide range of administrative and planning powers and functions (see Chapter Five for the role of the Danish counties).

Map 4.1 The Regions of Ireland

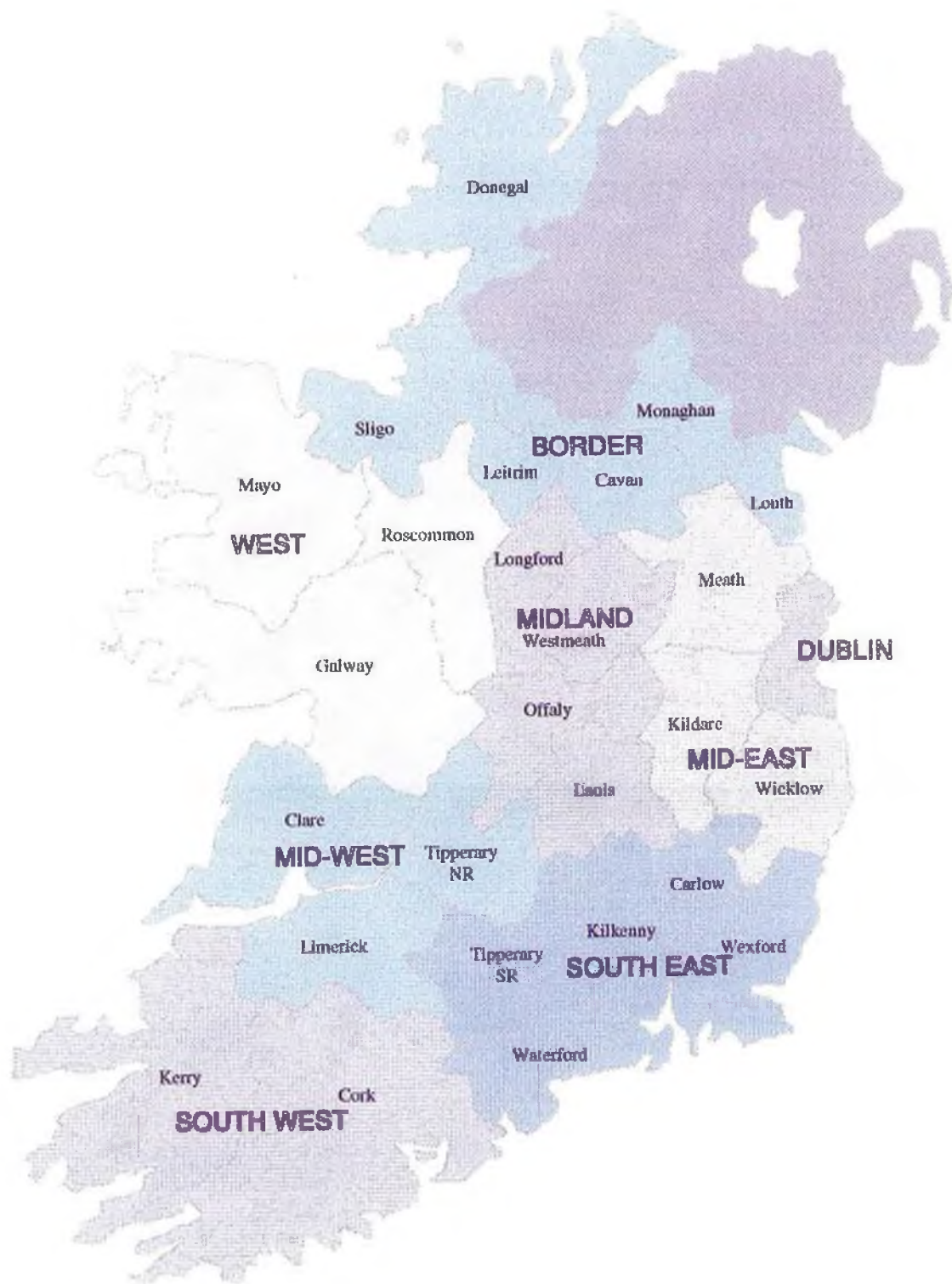


Table 4.1 Comparison of Irish Regions to Average of EU-15 Regions

<u>Region</u>	<u>Output</u> <u>£ 000</u>	<u>Population</u>
Dublin	9,326.3	1,056,666
South-West	4,139.8	546,209
South-East	2,420.7	391,046
Border	2,39.5	406,444
Mid-West	2,098.9	316,875
West	2,025.1	351,874
Mid-East	1,698.3	346,669
Midlands	1,132.2	205,252
Ireland	25,190.8	3,621,035
EU-15 Average (NUTS 2 Level)	20,557.3	1,806,461
EU-15 Average (NUTS 3 level)	4,107.5	360,942

Source: Fitzpatrick Associates (1997)

4.1.2 Current EU Regional Initiatives

The EU White Paper on Growth, Competitiveness and Employment (1994) and the Green Paper on Innovation (1995), identified respectively, the need to define a global strategy that would bring the public authorities, research bodies and various sectors of society together, and the importance of the regional level in the implementation of such a strategy.

Consequently, two complementary actions were launched. They are the Regional Innovation and Technology Transfer Strategies Programme (RITTS) and the Regional Innovation Strategies (RIS) Programme. The initiatives are aimed at supporting regional governments and/or organisations in the undertaking of a thorough assessment of the regional innovation system in order to arrive at a framework that would provide the optimisation of innovation policy and infrastructures at a regional level. In particular, strategies are to be aimed towards the needs of SME's.

Over the period 1996-1998 19 regions across Europe will undertake a Regional Innovation Strategy while 21 regions will be involved in the Regional Innovation and Technology Transfer Strategy Programme. The RIS aims to improve the capacity of regional actors to develop strategies aimed particularly at the needs of the business sector while the RITTS aims to provide a framework within which regions can optimise future RTD investment decisions.

The Mid West region is the only Irish region selected to take part in the RIS programme and is discussed in greater detail in Chapter Six. Forfás is undertaking an Irish RITTS Programme in order to understand more clearly how technology transfer operates in the Irish context and to assess the existing support mechanisms in this area. The project is divided into three phases and they are as follows;

1. Establishing the needs of local SME's in relation to innovation and technology transfer, drawing up an inventory of supply side initiatives and assessing the existing strategies of the various actors involved.
2. An examination by a broadly-based Steering Committee of the strengths and weaknesses of the regional infrastructure.
3. A follow-up and implementation of priority actions. (Forfás, 1996b)

Major findings following the completion of Phase 1 include;

- public schemes are not seen to be sufficiently specific to firm needs,
- a lack of awareness of public support schemes for innovation,
- a lack of skilled staff, and
- the different levels of competence and confidence of regional office staff who act as facilitators of innovation and technology transfer.

Phase 2 is currently taking place.

The RITTS Programme is being undertaken on a national level strengthening the perception of Ireland as a single region within the EU and raising confusion over the fact that the RIS is taking place within a region in Ireland. An opportunity by central government to place this programme within a region in Ireland has been overlooked and the whole promotion by the EU of instigating programmes at more local levels has been

disregarded. It illustrates a continuing trend of maintaining central control that characterises the allocation of EU funds in Ireland.

Notwithstanding the situation in Ireland, regional policies and the concept of a 'Regional System of Innovation' is growing in stature internationally.

4.2 REGIONAL SYSTEMS OF INNOVATION (RSI)

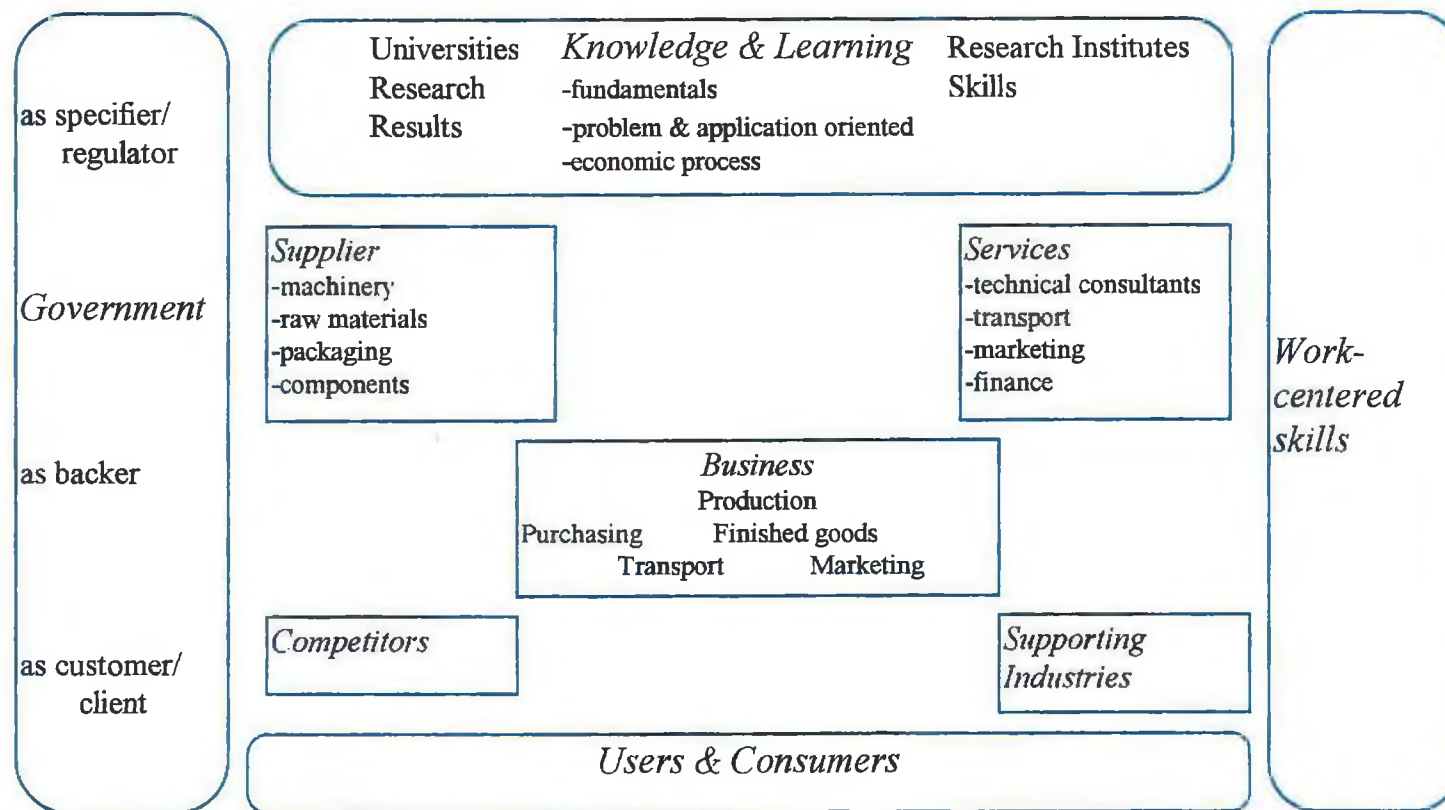
While much has been written over the last decade about the importance of, and the role that regions can play in the stimulation of economic development and in the regeneration of depressed areas, definitions and diagrams of the process of regional innovation have only come to the fore in the last number of years. In fact, much emphasis over the last decade has been placed on the concept of a National System of Innovation with the resultant neglect of regional policy concepts.

However two typologies which have emerged will now be discussed in brief.

4.2.1 Definitions and Diagrams

Von Gleich (1995) does not present a definition of what constitutes a RSI but rather adapts Porter's work relating to the 'Competitive Advantage of Nations' into the competitive advantage of regions. He defines innovation (P.2-50) as a "multiple interacting process" where it is important to first deal with the individual components and the relationships between them. Von Gleich's (1995) diagram of a RSI (see Figure 4.1) presents the most important elements and participants of the system, although noting that civil-societal participants (intermediate institutions between state and society or between politics and economy) have not been included.

Figure 4.1 Regional System of Innovation



Source: Von Gleich, 1995

Landabaso (1995, P.3) talks of a tentative regional model of the innovation process and defines the process of innovation as a;

...systemic phenomenon based on the accumulation of learning processes through networks of co-operation (mainly public/private and between firms) which encourage inter-action between those engaged locally in the economic and technological life of the region.

His regional model of the innovation process (see Figure 4.2) is entitled the 'Science-Market Circuit'. It includes a scientific sub-system but interestingly shows applied research being transferred to SME's without this transfer being reciprocated or without illustrating the importance of joint research between both.

Landabaso (1995) thus adopts a research and technology approach to the process while Von Gleich (1995) includes other influences, such as the role of government and work-centered skills. In both cases however, the influence of social and cultural factors on the innovation process have been omitted as well as the role of financial institutions and the vocational education system. Indeed, Von Gleich admits to influences that have been omitted from his diagram while similarly Landabaso states that his model does not cover all relevant aspects of the innovation process. The Scandinavian approach towards the NSI (see Mjoset, 1992, Figure 3.1, P.57) included such elements as a civil society and an apprenticeship system and the above systems may benefit from recognising their importance and their input to a regional system of innovation. Therefore, to date, no model claims to represent a complete Regional System of Innovation.

4.2.2 Critical Factors in a Regional Environment

Despite the dearth of models and definitions many lists of critical factors that characterise an entrepreneurial regional environment have been compiled. Malecki (1995) lists twelve such factors as compiled by Bruno and Tyebjee (1982) and are as follows; venture capital availability, presence of experienced entrepreneurs, technically skilled labour force, accessibility of suppliers, accessibility of customers or new markets,

Science



favourable governmental policies, proximity of universities, availability of land or facilities, accessibility to transportation, receptive population, availability of supporting services and attractive living conditions. It was accepted that most of these factors would be concentrated in large urban economies.

In the light of such theory discussed to date, the following list of factors and actors essential for the effective emergence of a strong RSI has been compiled. They are as follows.

1. Education

- Vocational training and an apprenticeship system.
- Education that encourages risk-taking, belief in one's self and initiative.
- Learning efficiency.
- Universities / RTC's.
- Public and private research institutes.

2. Technological Progression

- A balance of both large and small firms.
- Technical culture and technical efficiency.
- Sophisticated workforce.
- Flexible, autonomous work practices.
- Ability to interpret innovation in a new way.

3. Social Factors

- Social justice, civil society and a civic tradition.
- Culture of trust.
- Co-operation and competition.
- Entrepreneurial spirit / environment.
- Enterprise culture.

4. Exogenous Factors / Actors

- National System of Innovation.

- Environmental issues and standards.
- Inter-regional networking.
- Equal importance placed on each region.
- EU legislation and monetary union.

5. Intermediaries

- Local government.
- Public and private technology transfer agencies.
- Financial institutions / venture capital companies.
- Voluntary and social groups.
- Hard and soft infrastructure.

A strong RSI should contain a majority of these features which when linked together would form an effective and adaptable motor of development, both economically and socially for the whole region.

The existence of regional networks is a prime feature of a RSI and Cooke (1995) states that these consist of, large and small firms, research and higher education institutes, private R&D laboratories, technology transfer agencies, chambers of commerce, business associations, vocational training organisations, relevant government agencies and appropriate government departments. The hierarchical nature of regional networks is changing into a more heterarchical condition where;

..network relationships pertain based on trust, reputation, custom, reciprocity, reliability, openness to learning and an inclusive and empowering rather than an exclusive and disempowering disposition (Cooke, 1995, P.9).

It is therefore the relationship between the factors rather than the factors themselves that contribute to an effective RSI.

Concern for the local environment and support for firm formation (Malecki & Todtling, 1993) has been aided by a shift from state to self-regulation of economic affairs at regional and local level. The environment and the attributes that it encompasses for

regional development are often overlooked due to the emphasis that is often placed on individual institutes and programmes. The local environment is the innovator, providing an entrepreneurial setting in which new firm formation is achieved.

4.2.3 The Entrepreneurial Environment

The institutional structure of a region is not of prime importance, but rather it is the ability of the institutional structure to understand and accept that uncertainty is pervasive in the process of technological change and that it must adapt to suit current and future needs. This notion is intrinsic in the Structuralist Model of Lipsey and Carlaw (1996, P.14) which also believes that endogenous technological change requires "substantial amounts of tacit knowledge". Central to this model is the theory that technology operates within the larger concept of a facilitating structure. This structure includes, the existing stock of producers' capital goods, the geographical location of physical capital, the industrial structure (the degree of concentration/co-operation/competition), the economy's infrastructure and private sector institutions which assist in financing productive activity such as banks and insurance companies.

Lipsey and Carlaw (1996, P.23) conclude that;

Failure to appreciate the close relation between technology and structure has led to many policy failures when major technological leaps were attempted without a comparable policy to adjust the facilitating structure.

The time, costs and resources, both capital and human, available to undertake a particular strategy must be examined closely to ensure that it is in fact possible, through the existing structure or through changes that can be made in the facilitating structure. Remnants of the mass production era in the US has created an obstacle to the reorganisation of the firm structure to cater for the move towards flexible technology strategies. A preoccupation with short-term results and an under-estimation of human resources remains central in their institutional structure, inhibiting real technological progression. Strategies survive and are successful because they complement the environmental structure which is, or has been put in place, thus;

It will not do to borrow pieces of the West German or the Japanese system and try to make them fit an American context. Rather, for any of the reforms to survive and flourish the environment in which it is implanted must be transformed (Dertouzos, Lester, & Solow, 1989, P.49).

Regions must be willing to 'change everything' in order to maintain that which is worthwhile (Von Gleich, 1995).

4.3 THE CULTURAL INFLUENCE ON REGIONS

Malecki (1995) believes that the entrepreneurial event takes shape through the interaction of personal and environmental factors. Indeed, one more so shapes the other through their inter-existence. Failures in the entrepreneurial environment often occur due to deeper personal characteristics and attributes that shaped the setting. In fact it has been discovered that it is difficult for policies to transform an environment adverse to entrepreneurial activities into a favourable one, illustrating deeper, socially embedded obstacles (Malecki & Todtling, 1993).

The shaping of the practical performance of institutions by the social context within which they operate was clearly shown by Putnam (1993) who followed the development and performance over two decades of the new Italian regional governments formed in 1970. He concluded that (P.125);

In contemporary Italy, the civic community is closely associated with levels of social and economic development. Generally speaking, regions today that are civic are also healthy, wealthy and industrial.

However, innovation policies have a tendency to concentrate more on providing information and financial support rather than first looking at the environmental and cultural structures and seeing if they are receptive to innovation.

4.3.1 The High-Technology Path to Development

High-tech R&D, technology parks and innovation centres are only one element of a RSI but have received much attention and over reaction over the last two decades. However, doubts have already begun to arise over the efficiency of technology parks and their actual benefits to the local community (Maier, 1995). The incubator model of technology parks is seen as being only appropriate for small firms engaged in market niches, firms which are not appropriate for introducing endogenous regional development (Hilpert, 1991b). He continues that there is only a limited number of regional situations where the application of high-tech based endogenous development is appropriate. These are regions that are already participating in national technological industrial innovation, due to the existing location of research-intensive big firms (Hilpert & Ruffieux, 1991).

Technology parks act more as an attractant for large firms to locate R&D departments and many local and regional governments have not realised the inappropriateness of this policy in time and have got caught in a high-tech trap of paying out subsidies while achieving little local economic benefits.

Similarly, the role of higher education institutes, innovation centres and regional development agencies is quite limited with regard to the process of information gathering during the innovation process. Den Hertog, Roelandt, Boekholt & Vander Gaag (1995) following a study of the Dutch NSI found that R&D co-operation with clients and suppliers seemed to be as important as R&D co-operation with education research institutes and results clearly pointed to the importance of informal user-supplier interactions. Malecki & Tootle (1996, P.44) also describe how;

..empirical research consistently finds that learning about technologies occurs primarily via informal channels of communication - through interpersonal contacts.

4.3.2 Interpersonal Contacts and Networks

Informal networks form an integral part of RSI's throughout Europe and an example is the multiple network relationships found in Italy that "evolve and dissolve almost organically" (Malecki & Tootle, 1996, P.50). Networks between firms take time to develop and are crucially based on the growth of trust between two parties. From this stems the need to create a trusting society that would permit one firm to help another in the sure knowledge that this trust would not be abused and would be reciprocated when possible. A social system which has mutual trust, social co-operation and a sense of civic duty at its core will provide the environment for successful networking to take place. Alternatively Putnam (1993, P.109) discovered that "both low education and uncivic surroundings accentuate feelings of exploitation and powerlessness".

Similarly, Saxenian (1994, P.4) states that;

Network systems flourish in regional agglomerations where repeated interaction builds shared identities and mutual trust while at the same time intensifying competitive rivalries.

Her study of why Silicon Valley has adapted successfully to changing patterns of international competition, while Route 128 is losing market dominance, found that Silicon Valley has a more flexible system organised around the region and its professional networks, rather than around an individual firm. From the start there was a promotion of collaborative relationships among small firms leaving them open to new ideas and changes and consequently assuming new shapes.

Such tight social networks are an end result that can be stimulated through the fostering of collective identities and trust (Saxenian, 1994). Strategies that encourage inter-firm networking must take into account the social structures which must first be in place. The time that networking policy requires must also be acknowledged as well as the independent stance of most entrepreneurs. Therefore, as such, networking will not be easily arranged by one or two public agencies (Malecki & Todtling, 1993). Cultural

changes take time and effort, but can form the basis for the economic regeneration of a region.

The fostering of cultural factors related to entrepreneurship and the stimulation of an entrepreneurial environment must be undertaken first in the development of a strong RSI. The technological learning process cannot be separated from the behavioural characteristics of individuals (Karnoe, 1996) and thus the ability and even the desire to learn, innovate and create a new firm cannot be automatically generated through a plenitude of hard and soft infrastructure supports. In the small firm networks of Italy regional authorities have taken the lead by developing policy aimed at facilitating and fostering the process of innovation (Mazzonis, 1989). Other regional authorities must take such a lead by first developing a self-understanding of the regions' historical, cultural, political, institutional and economic structure to ensure that the most appropriate strategy is applied.

4.4 LOCAL GOVERNMENT IN IRELAND

Local government expenditure in Ireland per annum accounts for approximately 5 per cent of GDP, raises taxation of £340m and employs nearly 30,000 people (Department of Environment, 1996). Compared to other European countries the main weakness of the system lies in its inability to raise its own finances, a process controlled by central government. Since the inception of the state, local governments' functions have remained limited and have been further reduced, especially since the 1970's. In 1970 control of health provision was transferred to eight regional health boards, domestic rates were abolished in 1978 and more recent developments have seen the establishment of the Environmental Protection Agency in 1993 and the National Roads Authority in 1994 which further reduced LA functions. Also, on comparing the Irish local government system with the rest of Europe, it ends up at the bottom of the table with 122 local representative units (see Table 4.2) suggesting a need for an expansion in the local government system.

Table 4.2 Comparative European Local Government Systems

Country	Pop. 1988	Area sq.km	Land/ Region	County/ Kreis	Commune/ Municipal	Total No.of Units	Rank
Austria	7.6	83.9	9		2,304	2,313	7
Belgium	9.9	30.5	3	9	589	601	10
Denmark	5.1	43.1		14	275	289	16
Finland	4.9	338.0			461	461	13
France	55.9	549.0	26	95	36,757	36,878	1
Germany	61.4	248.6	11	328	8,413	8,752	2
Britain	57.0	244.8		63	457	520	11
Greece	10.0	132.0	13	51	5,999	6,063	5
Ireland	3.5	70.3	8	34	80	122	18
Italy	57.4	301.2	20	95	8,000	8,115	3
Luxem.	0.4	2.6			126	126	17
Netherl.	14.8	40.8		12	714	726	9
Norway	4.2	324.2		19	454	473	12
Portugal	10.3	92.4			305	305	15
Spain	39.0	504.8	17	50	8,038	8,094	4
Switz.	6.7	41.3	26	208	3,400	3,634	6
Turkey	54.0	780.6	67		1,800	1,867	8

Source: Coyle, 1996.

Danish regional and local government functions include, refuse collection and disposal, slaughterhouses, theaters and concerts, museums, art galleries and libraries, parks and open spaces, sports and leisure pursuits, roads, urban road transport, district heating, water supply, electricity, fire protection, pre-school education, primary and secondary education, adult education, hospitals, personal health, family welfare services, welfare homes and town planning. In comparison, Irish local government functions only include, refuse collection and disposal, slaughterhouses, museums, art galleries and libraries, parks and open spaces, sports and leisure pursuits, roads, water supply, fire protection, housing and town planning. In fact, Ireland has only half of the functions held by the Danish local government system (Government of Ireland, 1991).

There is an unwillingness to devolve real power and functions to local and regional tiers in Ireland to the extent that local communities now look to central government to solve their problems. Policy formulation takes place almost exclusively at central level, the regions taking on a more administrative role. Indeed it is accepted that "regional issues

in Ireland have not benefited from any sustained or continuous set of policies” (Shannon Development, 1996, P.2).

Regional policy dates from the 1950’s through the Undeveloped Areas Act (1952), the Industrial Grants Act (1956, 1959), the establishment of *Údarás na Gaeltachta* in 1957 and Shannon Development in 1959, and in various reports (Economic Development 1958, Buchanan Report, 1969). However, such policy declined from the mid-1970’s until the start of the 1990’s due to economic crises, such as the increasing levels of unemployment, with consequent shifts of government attention towards national issues.

The proliferation of small ad-hoc local partnerships and community enterprise groups in the 1990’s reflect EU pressure for more local and regional representation, rather than a real desire and concern for regional policies in the country. Indeed the OECD (1996) notes that Ireland is unusual compared to other European countries as the social partnerships did not come from a strong democratic tradition. Thus;

European regional development policy may therefore have provided the Republic with not only a greater degree of regional devolution than it has experienced in the past quarter century, but also the means to follow through on policy proposals and implement them via the European arena rather than the national one (Pownall, 1997, P.183).

4.4.1 Current Local and Regional State Initiatives

In 1991 the Barrington Report (Government of Ireland, 1991, P.1) stated that, “central government should be willing to let go and devolve functions”. However, the eight regional authorities, proposed in the report and which came into existence on the 1st of January 1994, are more like ‘regional assemblies’ than authorities, with no executive powers (Fitzpatrick Associates, 1997). In response to both EU and national pressure the Devolution Commission was set up in the Government’s Statement on Local Government Reform in July 1995, to set about a renewal of local government following the principles of subsidiarity, accountability, integration, effectiveness and participation. The government statement on the Interim Report of the Devolution Commission in August of 1996 accepted that the local government system will have three levels;

regional (mainly co-ordinating function), county (this as the primary unit of local government) and sub-county.

A further state Report entitled 'Better Local Government - A Programme For Change' (Department of Environment, 1996) included the following key actions;

- the systems of local government and local development will be more closely linked through the establishment of Community and Enterprise Groups that will produce plans by the end of 1997 for the integration of local government and local development from January 2,000,
- a greater emphasis on providing quality services and on serving the needs of the customers,
- measures for an improvement in the level of commitment of public bodies to the regional authorities, and
- new responsibility assigned to the regional authorities for the promotion of sustainable development.

Structural changes recommended in the Reports have been largely concerned with making the local partnerships and enterprise boards accountable to local government in an effort to improve efficiency due to concern about overlapping. As yet, new real functions and powers have not been placed under local authority control and Boylan (1996, P.204) states;

A critical test of the commitment to local development will focus on the political willingness to devolve real political powers, based on the principle of subsidiarity, to the local level.

The proposed future role for the regional authorities remains one of co-ordinator, which not only disregards EU policy on the strategic importance of strong regional policy but also overlooks the initial recommendation of the Barrington Report (Government of Ireland, 1991, P.2) which states;

The position (of the regional authorities) to be reviewed after five years: the possibility of direct elections to be considered at that stage together with an expanded role.

Such an expanded role should, without doubt, go beyond the promotion of sustainable development if Ireland is to have a regional tier of government which could have overall responsibility for the economic and social development of the regions. Also, it is doubtful whether without real powers, recognition of the role of the regional authorities by other public bodies will improve.

Shannon Development (1996) has called for the creation of a limited number (three to five) of Regional Development Companies that would, they suggest, deliver the majority of grants to Irish-owned enterprises in industry, tourism and related industries. Firstly, it is unclear why this role could not be undertaken by the current regional authorities, if it is indeed felt necessary, and secondly the number of companies proposed does not correspond to the existing number of regions in the country, thus possibly adding to existing confusion.

Therefore, while the recognition of the need for an effective regional structure exists, the building of a strong regional government is being continuously overlooked.

4.4.2 An Administrative Region in Ireland

Without even contemplating what is a region in Ireland, Irish public policy has failed to reach a consensus on what constitutes an administrative region. In spite of Barrington's call for a definition of regional boundaries for all purposes nearly twenty years ago it has still not been achieved (Share, 1992).

The need to standardise the regional boundaries across all public sector bodies has been raised by, among others, Fitzpatrick Associates (1997) and the Dublin Regional Authority (1995), due to the existence of some 200 public organisations which are involved in various aspects of regional development. The majority of these organisations do not operate within a set regional context increasing the complexity of co-ordinated action.

The Dublin Regional Authority (1995, P.31) state that;

..this fragmentation of inter-related services leads to individual symptoms to common problems being addressed by individual agencies in a compartmentalised fashion, thus inhibiting an overall appreciation of the underlying problems that would provide a more comprehensive and realistic approach.

They recommend the establishment of an inventory of public service providers in each region that could be used to identify gaps and/or overlaps in service provision.

The various regional boundaries that have been adopted by public sector bodies, and the change that has taken place from nine physical planning regions to the current eight regional authorities, have contributed little to the development of a regional consciousness. In fact, effort has been limited in Ireland with regard to establishing a regional dimension with national agencies simply delivering programmes and services through their local and regional offices (Forfás, 1996a).

It is doubtful whether a regional culture exists in Ireland at present, especially due to the continuing strength of county level affiliation, reinforced through GAA rivalries. Although county ties remain strong, the rural 'Meitheal' system of collective harvesting is dying out and helping hands have been replaced by machinery. Strong local political leadership has remained weak due to the limited role of local government and the persistence of localism and clientelism (Coyle, 1996). Guiomard (1995, P.199) states that;

It can hardly be denied that today in Ireland civic culture is weak, civic standards are low and our political culture is positively sick.

Local interest has largely turned to indifference as regards local government, due to the lack of faith in its ability to solve their problems. Centralised political and administrative powers have been coupled with a neglect of both horizontal and vertical ties and Shannon Development (1996) note that the state does not have a 'clear vision' of the role of the regions and how it can be related to state objectives.

Thus, in general, at central and local level an indifference to the regional tier exists. This is due partly, to ignorance of its benefits and, to central government fear that powers would be lost to it, and county level opposition to regional control of their functions. Fear and suspicion have thus resulted in a disregard of the regional level.

Pownall (1997, P.182) states that;

Radical development is not a feature of the Irish political environment, with policy makers on the inside wary of new proposals and developments resulting in the stifling of attempts at reform both within the industrial sphere and in the local authority environment. This makes the chances of internally driven reform even more remote.

Central government in Ireland will not devolve power unless pressured by the nation. Therefore, until the culture of dependency can be changed to one of local self-reliance, whereby through consensus devolved power will be granted, a strong system of local government will not be achieved.

4.5 A RSI FOR IRELAND

There is an inescapable inter-penetration of the major industrial and industrialising economies of the world, which will weaken National Systems of Innovation and hasten the time when discussions will centre on strengthening the global system of innovation. Paradoxically, it is likely to focus more attention on the strength of Regional Systems of Innovation, an emerging trend internationally, towards which Ireland is not yet fully alive (Forfás, 1996a, P.34).

The reorganisation of government structures along the principle of subsidiarity began in many European countries in the 1970's and early 1980's through the gradual transferal of powers to regional and local levels. Much of this action occurred due to pressure from local levels and due to a national recognition that certain activities could more effectively take place at a lower tier.

The strong centralised nature of the Irish administrative system never gave/trusted political power to local communities. This combined with a history of colonised rule has left a nation characterised by central dependency and emigration. Recent pressures, although not emerging from the general public at large, have rested on strengthening the local/county government system, but any real devolution of powers appears unlikely in the near future. Functions that could have been devolved to a regional government, such as regional health services tourism policies and enterprise development planning, have been instead devolved to various regional offices which have followed their own particular boundaries.

In Ireland the need exists for a nationwide recognition and promotion of a strong regional government system which would not only be able to co-ordinate devolved regional functions, but would also engage in regional planning which would emerge from, and contribute to, county and local plans. Devolution to regional and local levels will not occur overnight and will not be achieved until these levels are both prepared and committed to the process. Only then, when an on-going devolution of central government functions is initiated, will public and private industrial development and support agencies achieve the stimulation of a Regional System of Innovation.

Ireland needs a cultural shift away from victim Irishness, dependent and clientelist, towards power Irishness, civic and meritocratic (Guimard, 1995, P.248)

Simply, a strong regional culture is the first step in the achievement of a Regional System of Innovation and only when this is in place can the factors and actors that contribute to its sustainability take shape. That is not to say that this culture will then be fixed, but rather will evolve and be continuously reinvented. It must also be remembered that the regional culture at a particular time is made up of an accumulation of its constituent local cultures, the foundation of all development. The importance of local culture was effectively portrayed by Wendell Berry (cited by Douthwaite, 1996, P.360) who states;

The loss of local culture is, in part, a practical loss and an economic one. For one thing, such a culture contains, and conveys to the succeeding generations,

the history of the use of the place and the knowledge of how the place may be lived in and used. For another, the pattern of reminding implies affection for the place and respect for it, and so, finally, the local culture will carry the knowledge of how the place may be well and lovingly used and, moreover, the implicit command to use it only well and lovingly. The only true and effective 'operator's manual for spaceship earth' is not a book that any human will ever write; it is hundreds of thousands of local cultures.

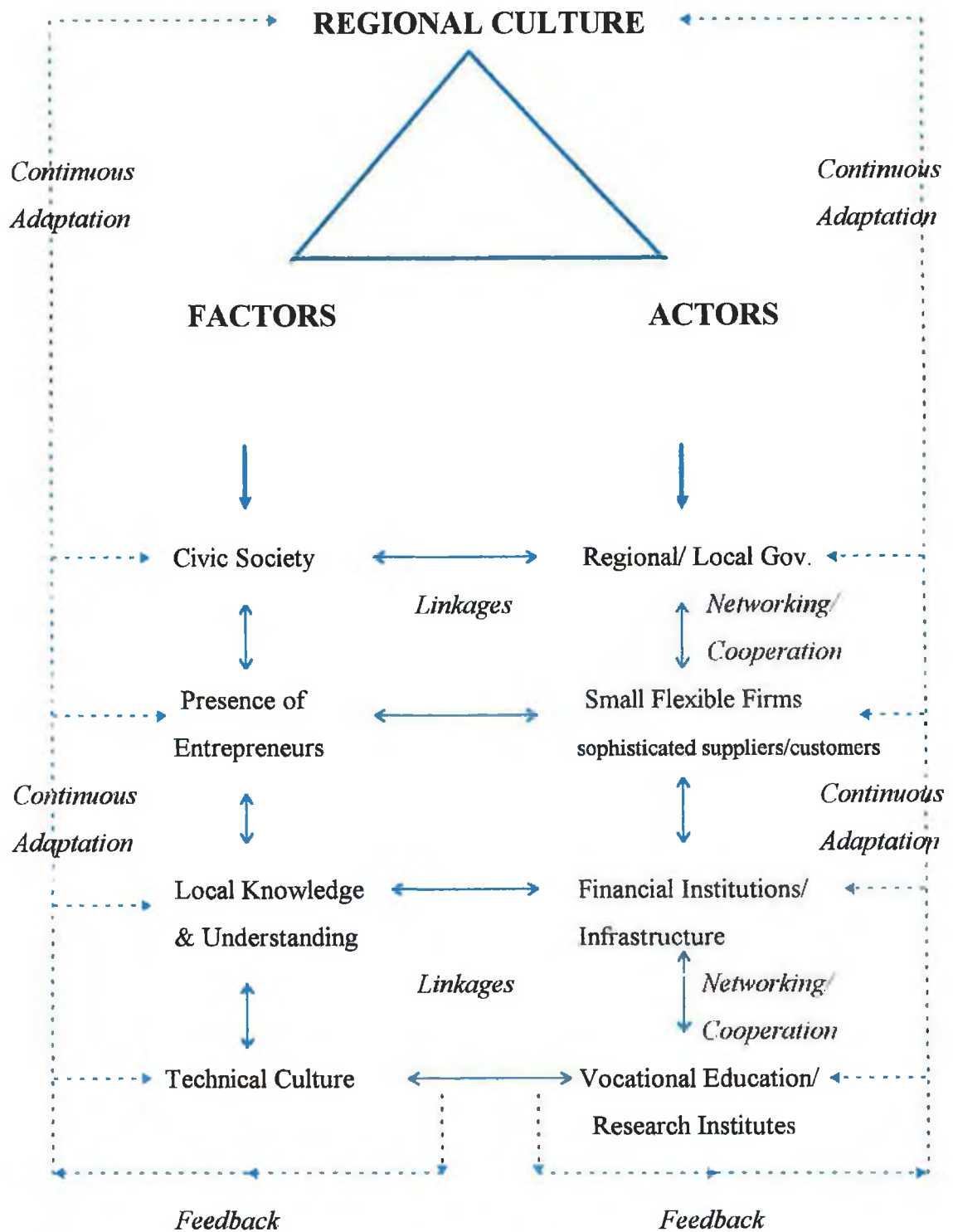
This quote also illustrates the importance of the tacit experience and knowledge that can never be learned from a book.

A Regional System of Innovation will thus be defined here as the committed and competent interaction of all public and private sectors, in the presence of unique regional factors, towards policies and actions that will improve the economic and social condition of the region (see Figure 4.3). The model places a strong regional culture and particular factors and actors as the basis of a successful and sustainable regional system of innovation. The factors are closely linked to the regional actors as for example; a strong civic society is as much a result of a strong local government system as it is its instigator, entrepreneurs require sophisticated customers and suppliers to encourage further innovations as much as they in turn rely on these innovations for their survival. Local knowledge and understanding is essential for the effective function of agencies and institutions especially the financial sector and a technical culture develops and grows out of an effective vocational and research sector. Permanence is not a feature of the RSI. All elements influence each other and lead to the continuous adaptation of the system, a feature necessary to ensure its sustainability over time.

The case studies of Ringkjobing County and the Mid-West Region, in Chapters Five and Six respectively, will be examined under the following key headings derived from this model. They are;

(1) Industrial structure, strategy and initiatives. (2) Their respective administrative systems. (3) The overall support structures in place for firms. (4) The education systems. (5) Linkages in place and the regions social structure. (6) Their cultural affiliation, be it to the local, regional or central level.

Figure 4.3 A Regional System of Innovation



It has been shown that the Irish regions are sufficient in population size to require a strong regional government which holds real devolved powers. However, as stated, this will not be achieved until the Irish people demand and take this power into their own hands. As Guiomard (1995, P.252) concludes;

There are no magicians who will lift the burden of Ireland's problems from the shoulders of mortals. Irish citizens must act or resign themselves to more of the same. Arise - and follow yourself.

4.6 CONCLUSION

Today regions are looked towards as the instigators and creators of new economic development in the face of world wide recession. This has largely occurred due to the emergence of prosperous regions within countries that overall are not performing well. The EU policy of subsidiarity has coincided with similar national policy changes which since the 1970's have been gradually devolving powers to more local and regional levels.

Although not the only factor in regional success, strong local power brings feelings of inclusiveness and control over one's own life, from which a strong civic culture can emerge. Simply devolving power is not the answer however, as the environment to which it is devolved must be capable of dealing with this new role. More importantly, the environment must be capable of molding and adapting this new structure to fit current needs. Therefore, it is not so much the actual devolution of powers that is all important, but rather the social and technical culture that exists to use and adapt this power.

Recent models of Regional Systems of Innovation have concentrated solely on the actors without looking at the factors that make up the regional environment. In addition, research institutes, science parks, and firms' technology needs have constituted the main elements of the process. It was shown that the high-tech path to development does not suit all regions and in fact may not be the most appropriate strategy, even though it may be the most popular.

Social and cultural factors are seldom taken into account when implementing industrial policies and often are not even understood. It appears that continuous learning, continuous adaptation and continuous co-operation form the basis on which a region succeeds, grows and most importantly changes. The region also becomes a region due to a shared identity, mutual trust and joint commitment to develop it both socially and economically.

Ireland is lacking in many of the above characteristics with the absence of any regional culture, civic pride or strong local government system. Recent industrial policies have failed to address real local situations and their appropriateness has to be questioned. Local government reform proposals leave the regional tier with merely a co-ordinating function and further extended roles and powers in the near future seem unlikely.

However, in most other European countries the devolution of power to regional and local levels was fought for, and until a strong regional culture can be stimulated in Ireland a regional government will be regarded as unnecessary and unwanted.

A Regional System of Innovation must therefore be home to a strong regional identity and culture with which local factors and actors will inter-relate in order to develop the most appropriate strategies at that particular time.

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CHAPTER FIVE
THE DANISH NATIONAL
AND REGIONAL INNOVATION
SYSTEM

5.0 INTRODUCTION

The success of regions like the 'Third Italy' have shown other developed countries that economic development can be achieved through traditional industries. Denmark, often regarded as backward due to the predominance of traditional industries, is a nation that has provided better living conditions and prosperity for its inhabitants over the last century than many other European countries. With a population of 5.2 million people and a strategic location between the EU, the Nordic countries and Eastern Europe, Denmark is regarded as a nation of social equality and consensus which can claim to having only 4 per cent of families living below the poverty line (Danish Ministry of Social Affairs, 1995).

Denmark, like Ireland, has a relatively small domestic market, a strong factor endowment in natural resources, was relatively late industrialising, and up until the 2nd World War was strongly dependent on agriculture (Department of Industry and Commerce, 1992). Despite this late start, today a Danish Ministry of Foreign Affairs publication (1995, P.2) opens by stating;

The products manufactured in Denmark, one of the smaller EU member states, are so diversified that it would be simpler to list the things that Denmark does not produce.

The food industry, clothing and textiles, wood and furniture, building materials, iron and metal goods, and ships represent some of the major manufacturing sectors. The food industry remains Denmark's largest industrial sector and Denmark has become a world leader in biotechnology research, pharmaceuticals, enzymes and food ingredients. The major industrial growth areas at present are information technology and software, biotechnology, food and beverages, and the development of equipment for environmental protection and energy consumption (Danish Ministry of Foreign Affairs, 1995).

It appears that these successes have been derived primarily from its ability to develop niche markets which suit the SME structure of Danish firms (Department of Industry

and Commerce, 1992). It is also generally accepted that Danish firms have a willingness to co-operate and these tight social networks that exist in the institutional structure may in fact be the actual core of the whole development process. Closely linked to this is the high skill level of the population who hold a strong orientation towards technical/vocational education and training. These two main principles are those on which we as outsiders and the Danes themselves base their relative successes.

Obviously many more issues are involved as development stems from the long tradition of independence stretching from the self-help and the craft movements. The role of the state and the assistance offered by both public and private bodies for the development of new enterprises also constitute major issues. In the first half of this chapter these issues will be discussed in order to gain a deeper understanding of the progression and present state of the Danish economy and industrial policy. This knowledge will then be used in the second half of the chapter to assess the direction industrial policy is taking in a region in West Jutland, namely Ringkjobing county. Conclusions and observations will be derived from interviews carried out in the area.

In total this chapter aims to provide a clear and full understanding of the institutional framework and the industrial policies that are currently being followed in Denmark. The in-depth analysis of Herning-Ikast, one of the most progressive regions in Europe today, will allow for the creation of a micro-picture of the intricacies of the innovation process at the level where real development occurs.

5.1 CENTRAL, REGIONAL AND LOCAL GOVERNMENT

The kingdom of Denmark is a constitutional monarchy with a prime minister who answers to a 179-member parliament called the Folketing. Responsible for the overall policies of the country the state looks after matters of 'common nature' such as, foreign affairs, defence, the police, telecommunications and universities. There are 22 ministries. The newest ministry established in 1993 is for Research and Technology.

In 1970 a Local Government Reform established the current two-tier system of local government which consists of 14 counties (amt) (see Map 5.1) and 275 local authorities (kommune) from what previously had been 25 counties and 1,388 local authorities (LA's). The National Association of LA's in Denmark (1995, P.2) states;

Whilst Danish counties are geographic areas devised mainly for administrative and managerial convenience, LA's usually represent defined communities with a shared sense of place and belonging.

While Denmark has a long tradition of local government autonomy which is written into the constitution, the reform of 1970 with its basic principle of subsidiarity laid the foundations for the transfer of responsibilities from central to local government (The Association of County Councils in Denmark, 1995). This process of decentralisation did not happen immediately but rather cumulatively from various pieces of legislation, for example, the abolition of individual sickness benefit schemes in 1973 and their replacement by a county-run general health service, the take over by counties of the post-16 secondary schools and courses in 1986 and the authorisation given to counties in 1992 to promote local enterprise. The devolution to local authority level has also brought with it widespread involvement in district heating plants and electricity generation.

5.1.1 The Roles of the Counties and Local Authorities

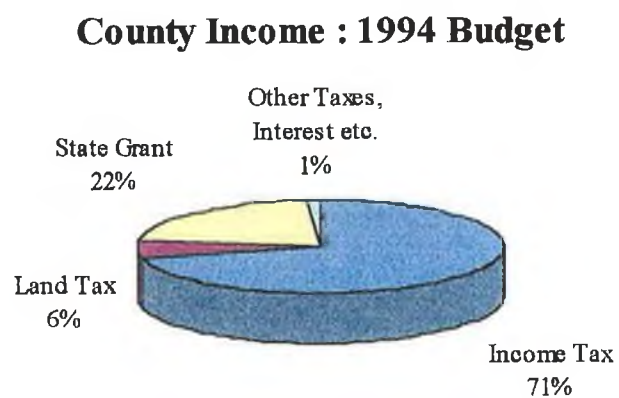
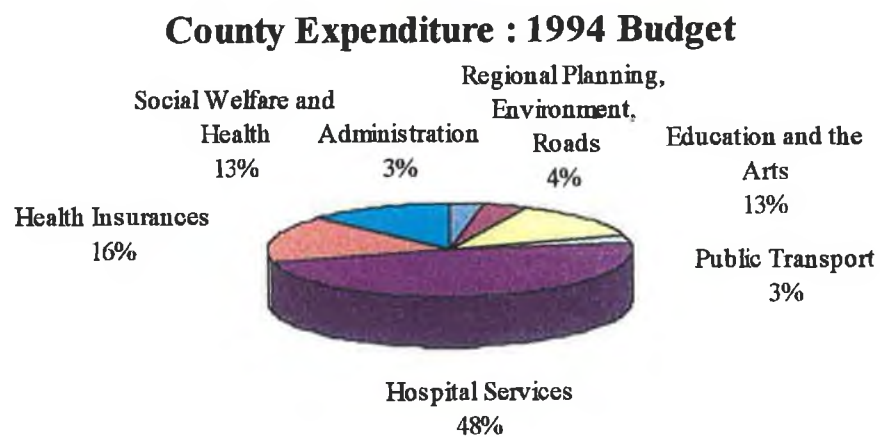
The counties carry out functions deemed too comprehensive to be carried out by a LA and believed to be best dealt with on a regional basis. The most important functions are; the provision of hospitals and health services, post-16 secondary education, social welfare of the disabled and provision of special services and facilities, such as, rape crisis centres, regional planning, protection of the countryside and the environment, some services for the business sector, and the construction and maintenance of the highways and public transport. Figure 5.1 illustrates the breakdown of county expenditure and income.

Map 5.1 The Counties of Denmark

- | | | |
|---------------------------|---------------------------|---|
| 1 County of Copenhagen | 6 County of Bornholm | 11 County of Ringkjøbing |
| 2 County of Frederiksborg | 7 County of Funen | 12 County of Århus |
| 3 County of Roskilde | 8 County of South Jutland | 13 County of Viborg |
| 4 County of West Zealand | 9 County of Ribe | 14 County of North Jutland |
| 5 County of Storstrøm | 10 County of Vejle | 15 The Cities of
Copenhagen
and Frederiksberg |



Figure 5.1 Danish County Expenditure and Income



Source : The Association of County Councils in Denmark, 1995.

The role of local authorities includes; maintenance of personal identity numbers, income tax returns, administration of social security arrangements, local planning, primary and secondary schools up to the age of 16, nurseries (65 per cent of all 0-5 year olds and 84 per cent of all 3-5 year olds are looked after under LA childminding arrangements, The National Association of LA's in Denmark, 1995), care of the elderly, local road construction and maintenance, and water supply and waste water treatment. Figure 5.2 illustrates a breakdown of Local Authority income and expenditure.

The National Association of LA's and the Association of County Councils in Denmark have been set up to strengthen co-operation between the counties, the LA's and the state.

Counties, over the last decade, have been very active in schemes aimed at job creation in the form of employment and training schemes. This they have done in co-operation with the LA's, job centres, technical schools and trade unions. Many of the LA's are highly innovative striving to "create efficient organisations which are customer driven and citizen sensitive" (The National Association of LA's, 1995, P.3). However;

The real basis for local self-government is the power of LA's to levy taxes on both income and property (The National Association of LA's, 1995, P.3).

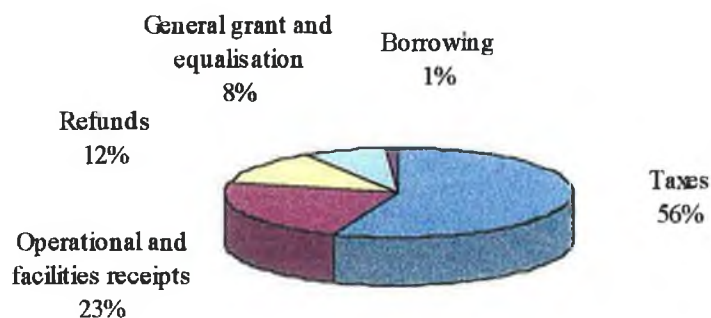
Danish LA's spend sums equal to 30 per cent of Danish GNP (The National Association of LA's, 1995) and 75 per cent of public employees work for local and county authorities (Danish Ministry of Social Affairs, 1995). About 70 per cent of total tax revenues is collected by the state, the counties and LA's collect the rest. In the case of income taxation, the municipality levies the taxes on behalf of the other taxation authorities. Thus in practical terms this gives them real and tangible power.

5.2 INCOME REDISTRIBUTION AND THE WELFARE STATE

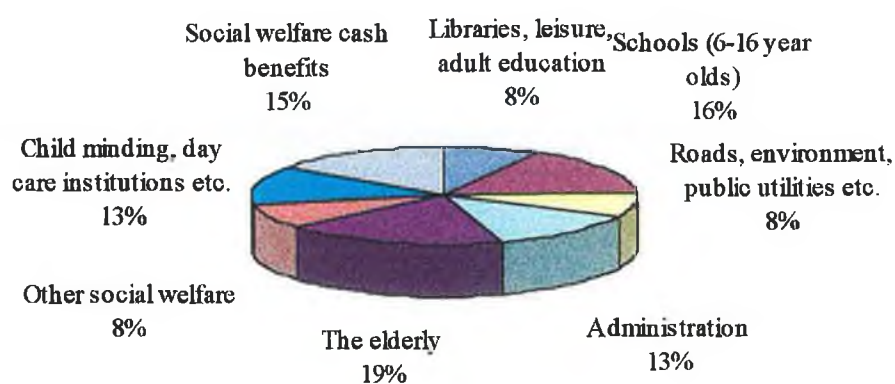
The state collects such a high share of the taxes as, in addition to financing its own operations and the interest payments on the national debt, there are the income transfer payments such as old-age pensions and unemployment and sickness benefits to be made.

Figure 5.2 Danish Local Authority Income and Expenditure

Local Authority Income : 1995 Budget



Local Authority Expenditure : 1995 Budget



Source: The National Association of Local Authorities in Denmark, 1995.

In addition the state gives an annual grant to the counties and LA's. This general grant which in 1994 amounted to DKK36,000 million is not earmarked by the state for any specific local government activity (The Association of County Councils in Denmark, 1995).

Denmark adheres strongly to the principles of universality and equality and 80 per cent of the transfer payments go to people who otherwise would be below the poverty line. About 20 per cent of GDP is used for these transfer payments. Hansen & Butler (1995, P.170) describe how;

In 1990-91 Denmark was the OECD country with the next highest share of public expenditure measured as a percentage of GDP (57.2 per cent).....74 per cent of this expenditure in Denmark was welfare state related.

While most European countries have an insurance based welfare system Denmark has a universal system which is available to all households and financed by the general public to the extent that Danish public spending has reached almost 70 per cent of GDP (Christiansen, 1996).

The result of such income transfers however, is that local and regional income levels become heavily influenced by it. This situation was accentuated in the period 1980-1992 when, due to an economic crisis, central government placed increasing control on local government expenditure and taxation and subsequently, its actual activities. Hansen & Butler (1995) suggest that the achievement of greater social equity is related to a reduction in local autonomy. They continue by talking of the potential 'local economic trap' of declining employment and population and consequently the rising taxes and user payments that Denmark faces. Although the average production worker paid 47 per cent in direct tax in 1992 (Christiansen, 1996) and despite being faced with the problem of unifying the welfare systems within Europe, the Danes still hold strong to their egalitarian society and wish to maintain the high levels of income redistribution.

5.2.1 Civil Society

The existence of local governance in Denmark means that decisions are taken close to and in dialogue with the people. Decentralisation ensures that the state must get the approval of all municipalities before a development strategy, for example, may be implemented thus proving difficult to favour one region over another. Kristensen (1995) describes how many of these 'so-called public institutions', although funded primarily by the state, are self-owned whereby they each have their own individual rules resulting in a rather weak state unable to act as an integrated body. Kristensen (1995, P.384) continues;

The state being a weak agency, civil society was created by a very intensive process of forming associations from the 1870's to 1914.

A situation developed whereby private associations were created to regulate where state initiatives had been deficient.

The Danes have a long history of doing things for themselves, for example, the folk high school movement. They are actively engaged in social activities and have membership of many groups that are involved in local development. In Denmark one can find many varied groups working together in novel ways for the good of their local community.

The Danish financial system is a case in point where the local banks and savings banks have a traditionally strong position. The Danish financial system never developed into the capital market based system of its neighbours due to the reluctant development of the stock market and the strong position held by the building societies. While many of the local banks have now merged and are branches of larger regional or national banks, they had already developed the capacity to act on their own within the larger context and thus still provide the local personal service that firms require.

5.3 THE DANISH ECONOMY

The Danish economy was primarily agricultural until the 1930's when Denmark experienced one of its agricultural crises. However, it was not until the 1960's that industrialisation really took off. Agricultural exports fell from around two thirds of total exports at the beginning of the decade to just over one quarter by the early 1970's (EIU, 1991). This rapid transition brought a degree of imbalance which was exacerbated by the oil crisis of 1973. Due to the country's huge dependence on oil foreign debt began to rise, soon followed by both inflation and unemployment and tight fiscal policy was implemented. By 1980 Denmark had entered a major recession. The new government in 1982 focused on the reduction of deficits and experienced reasonable growth until 1986. This was then followed by another recession which ended in 1989.

Although Denmark's standard of living is well above the EU average its GDP reduced from being six times that of Ireland to three times between 1960 and 1990 (Department of Industry and Commerce, 1992) and has undoubtedly reduced further in light of current Irish economic growth rates. Unemployment represents another problem area in the Danish economy as, apart from a fall between mid-1983 and 1986, it has risen steadily since the mid-1970's (Jensen, 1996). However, while unemployment remains high - at the beginning of 1996 it fell to just above 9 per cent after reaching 12.6 per cent in 1994 (OECD, 1996) - it is evenly distributed across age groups. "In particular, the youth unemployment rate in Denmark is among the lowest in Europe" (Jensen, 1996, P.7). The labour market reform (which will be returned to later) in 1993 increased flexibility on the labour market and has seen an increase in private sector employment. Unemployment is expected to remain high albeit falling for some time as stable and lasting gains are being aimed for.

Thus, while the Danish economy is in many ways doing better than other European economies three main blemishes are identified by Den Danske Bank (1996). They are; the budget balance is still negative even though the economic upswing has now been running for the last three to four years, wages are rising faster than abroad, and statistics remain uncertain due to recent revisions by the Danish Statistics Office.

The current account has experienced a deficit each consecutive year from 1964 to 1989 (Jensen, 1996), and the government debt remains close to 45 per cent of GDP (OECD, 1996). Two thirds of Denmark's merchandise export earnings are from the sale of manufactured goods and though most of the growth in exports in recent years has focused on the emerging markets in Asia and Eastern Europe, Germany, Sweden and the UK remain its principal trading partners (Department of Industry & Commerce, 1992).

The economic upturn that began in 1993 was initially led by private consumption and high car sales and a healthy construction sector have aided the prediction that consumption will grow by 2 per cent in 1997 (Den Danske Bank, 1996). In 1996 public employment grew by about 20,000 placing pressure on tax rates. Holding inflation at the 2.25 region in 1997 in order to slow wage growth (Den Danske Bank, 1996) is necessary for overall competitiveness even before the EMU convergence principles are taken into consideration.

Thus, while there are the risks of the increasing tax burden and possible wage increases Denmark is very actively pursuing controlled and long-term gains in production and employment evident from the launch in October 1996 of its first comprehensive document on industrial policy.

5.4 INDUSTRIAL POLICY

In the 1960's industrial production overtook agriculture as an economic sector and today 19 per cent of the workforce are employed in industry compared to 5 per cent in agriculture. Likewise 76 per cent of all product exports are provided by industrial production while agriculture accounts for 14 per cent (Danish Ministry of Foreign Affairs, 1995). More than 75 per cent of Danish industrial companies employ less than 50 people (Danish Ministry of Foreign Affairs, 1995), and policies and programmes aimed at the SME sector reflect this fact.

The Ministry of Industry which is responsible for the formulation and implementation of industrial policy includes, inter alia, the following bodies:

The Business Council - which registers businesses and ensures that they run according to the rules.

The Council for Improving Businesses in Denmark - which is responsible for R&D, marketing and export promotion, venture capital, regional infrastructure, technological infrastructure and development programmes. There are no local sub-units but rather the municipalities have direct linkages with the council.

Patent Offices.

Technological Information Centres.

The Growth Foundation - which helps generate growth in businesses by, for example, placing consultants in firms.

5.4.1 Industrial Development Programmes since 1970

The Technological Information Centres (TIC's) were established in the 1970's to develop industry in the country by providing needed information through the transfer of know-how and competence. There are 15 TIC's in Denmark today. Following the 1973 election, programmes to help the unemployed to start their own businesses were initiated. These two measures signaled the development of a technological service system infrastructure providing firms with access to technological services. The 1980's saw the emphasis shift towards Technological Development Programmes encouraging Danish firms to use information technology. In 1988 the National Agency of Industry and Trade (NAIT) was founded with four main divisions. They are; Internationalisation and Market Development, Technological Infrastructure, Research and Technological Development, and Regional Infrastructure and International Trade. The agency runs many programmes such as the Technology Development Programmes and also ensures that Danish firms are deriving maximum benefit from available EU funds.

Technological Service Institutes are another element of the technological service system. They operate on a commercial basis assisting companies with the practical adaptation to new competitive conditions. They operate in fields such as, technology and market development, training and information. In the late 1980's Danish policy makers believed that the population of small firms was too large and consequently the Danish Network Programme ran from 1989 until 1992. It was terminated due to limited success. Huggins (1996) believes that the programme's real success was the awareness it created of networking in Denmark. This programme was superseded by the Technology Partnership Programme operated by the Danish Technological Institute (DTI). Here the DTI acts as a technology intermediary or transfer system as the programme aims to provide Danish firms with access to world-wide networks of information and knowledge.

5.4.2 The Progression of Regional Development Policies

Though the first Regional Development Act occurred in 1958 regional policy has never been highly regarded in Denmark and since the first oil crisis in 1973 it has continued to lose importance. As mentioned earlier the provision of income has been regarded more as a social than a regional problem. However, in the midst of such neglect, a major redistribution of industry has occurred during the last twenty years from the industrialised east to the agricultural west of Denmark. Kristensen (1990, P.3) describes how;

Growth has come in former agricultural areas in what has been considered the peripheral regions of Jutland and carried out by SME's showing remarkable adaptability.

During the economic crisis of the mid-1970's, when it was expected that production units would move to the lower cost countries, while maintaining their high skill facilities in the cities, western counties experienced growth of about 10 per cent in both enterprises and employment between 1972 and 1980 (Kristensen, 1990). This growth was initiated locally, it was not due to redistribution from the east.

The 1980's witnessed the Act on Free Municipalities and Counties where development activities occurred in five counties and forty municipalities and a Regional Development Act in 1988 provided grants to advance the development of industry and commerce. However, the Government in 1990 reverted to the 'problem' of the large population of SME's in the country. Policy called for mergers and the creation of large enterprises to enable Danish industry engage in high-tech projects and market on an international scale. Ironically this policy direction appears to have forgotten one of the major reasons for Denmark's economic success, namely its independent and innovative entrepreneurs who have set up a successful network of SME's.

Policy in the early 1990's became more selective and resulted in the establishment of a regional incentive policy. However the programmes offered have not aided the development of firms in peripheral regions as they could "not comply with the more advanced requirements of these programmes" (Cornett, 1995, P.1-143). Cornett (1995, P.1-144) sums up the state of Danish regional policy by commenting that;

Basically, the most important feature of regional policy in Denmark is the lack of policy in the form of state policy.

It appears that state budget cuts have been a prime contributor to the decline of regional policy, budgets for regional policy have been reduced and current regional policy does not provide special attention for weak regions. The Danish Industrial Act 1991 removed the Regional Development Board replacing it with a Council for Industrial Development and withdrew direct grant assistance in favour of support through programmes.

Regional policy is virtually non-existent at national level with net outlays for regional development less than 2.5 per cent of total net outlays (Cornett, 1995). Thus, regional policy has been left to the initiatives of the local and regional levels. Regional initiatives have often worked very closely with EU structural programmes so that support for Danish regional policy comes largely from European rather than national level (Hansen & Butler, 1995).

5.4.3 Technology Policy

The overall emphasis has been on technical services organised through a network of public or semi-public technological institutes rather than on direct support schemes for research and development to the firms themselves (Huggins, 1996, P.523).

While government policy is non-interventionist it still encourages the transfer and assimilation of technological knowledge and market information to the SME sector. The 1960's can be regarded as the decade when Danish firms began to specialise and this specialisation is low in R&D intensive products and high in consumer durables. This niche strategy has been subject to recent criticism in government circles as it fails to provide 'proud' data of 'high tech' R&D. This concern has resulted in capital from the SME sector being channeled towards R&D intensive mass producers.

Growth in Denmark has been founded on the development of indigenous industry. Consequently inward investment has not played a significant role although it has begun to take off since the 1980's. In 1989 a programme of actively promoting inward investment was initiated and while this has been centred on the US and Japan the largest proportion of investment to date has come from the Nordic countries (Department of Industry and Commerce, 1992). The most recent promotional programme is 'Invest in Denmark' which is being carried out by the Ministry of Business and Industry.

Denmark's indigenous high tech niche sector appears to have problems and Mjoset (1992) describes its weak linkage to the rest of the economy and thus its openness to takeovers by foreign investors. He compares Denmark's high tech position to that of Ireland due to the increase of outside control. Finally, interest in technology transfer and co-operation between universities and industry first appeared in the early 1980's and today Denmark has three university linked science parks based in Aarhus, Aalborg and Copenhagen.

5.4.4 The New Industrial Policy

Industrial policy in the last number of years has experienced a shift in emphasis from focusing on company oriented support schemes to concentrating on a more general framework for strengthening the competitiveness of industry (Danish Ministry of Business and Industry, 1995). The Danish Ministry of Business and Industry (1995, P.10) state;

The paramount aim of the new point of departure for industrial policy is to endow companies with a good business framework.

This business framework covers many factors including (P.10); a well-educated workforce, a good infrastructure, an efficient public service, well functioning markets, and interaction between the public and private sectors.

The policy aims to strengthen the general framework to ensure that the business community as a whole will benefit from, for example, a high level of education, a high level of research, efficient technological services and a good physical infrastructure. This policy also wishes to attract more foreign investment which they accept is only possible if a highly educated workforce with a high degree of competence can be offered.

5.5 THE DANISH EDUCATION SYSTEM

In order to compete internationally today a nation must possess the ability to adapt to new challenges which currently demand the development of more knowledge-intensive production. New technologies need to be exploited to provide new sources of employment and consequently require higher qualifications. Danish industrial policy appears to incorporate an awareness not only of this need but also of the need to improve job opportunities for the lesser educated section of the workforce that has been released by the process of readjustment (Danish Ministry of Business & Industry, 1995).

Denmark regards the skills of its people as being its basic raw material and this is reflected in the fact that Denmark spends far more of its GNP than the EU average on education and “educational expenses per capita -age 5 to 24- are the highest among EC countries”(Kristensen & Petersen, 1993, P.5). However, Kristensen (1990) describes how even the Danish authorities find the system which is divided between many departments (Education, Labour, Culture, etc.) difficult to understand.

Figure 5.3 illustrates the various paths that can be chosen under the present education system. Denmark has 5 universities and 6 Business Schools (2 of these business schools are within universities). From OECD statistics relating to the percentage of upper secondary students enrolled in general and vocational education in EU countries in 1991 it can be seen in Figure 5.4 that in Denmark approximately one third undertake a general education while two thirds undertake a vocational education (Cedefop, 1995).

5.5.1 The Craft Education System

The Danes have a long tradition of being independent and this can be clearly seen in the ‘self-help movement’ of the yeoman class that took place towards the end of the last century. They constructed their own institutions such as their own savings banks and building societies. Then, as the railway system spread to the whole of the country railway towns were created. These became service centres for the neighbouring agricultural districts and the craft movement was born.

“Between 1870 and 1930 local craft organisations initiated and organised 340 technical schools throughout the country” (Kristensen & Petersen, 1993, P.8), and Kristensen (1995) regards this creation of the craft educational system as the greatest success of the craft movement. Thus when the agricultural crises of the 1920’s, 1930’s and 1960’s hit Denmark a general shift occurred from agricultural to industrial production. This was possible for a large group of the population, rather than just the self-employed craftsmen from the railway towns, due to the development of the education system. During the 1950’s and the 1960’s West Jutland achieved relative success in the face of adversity and Kristensen (1995, P. 214) contends that;

Figure 5.3 The Danish Education System

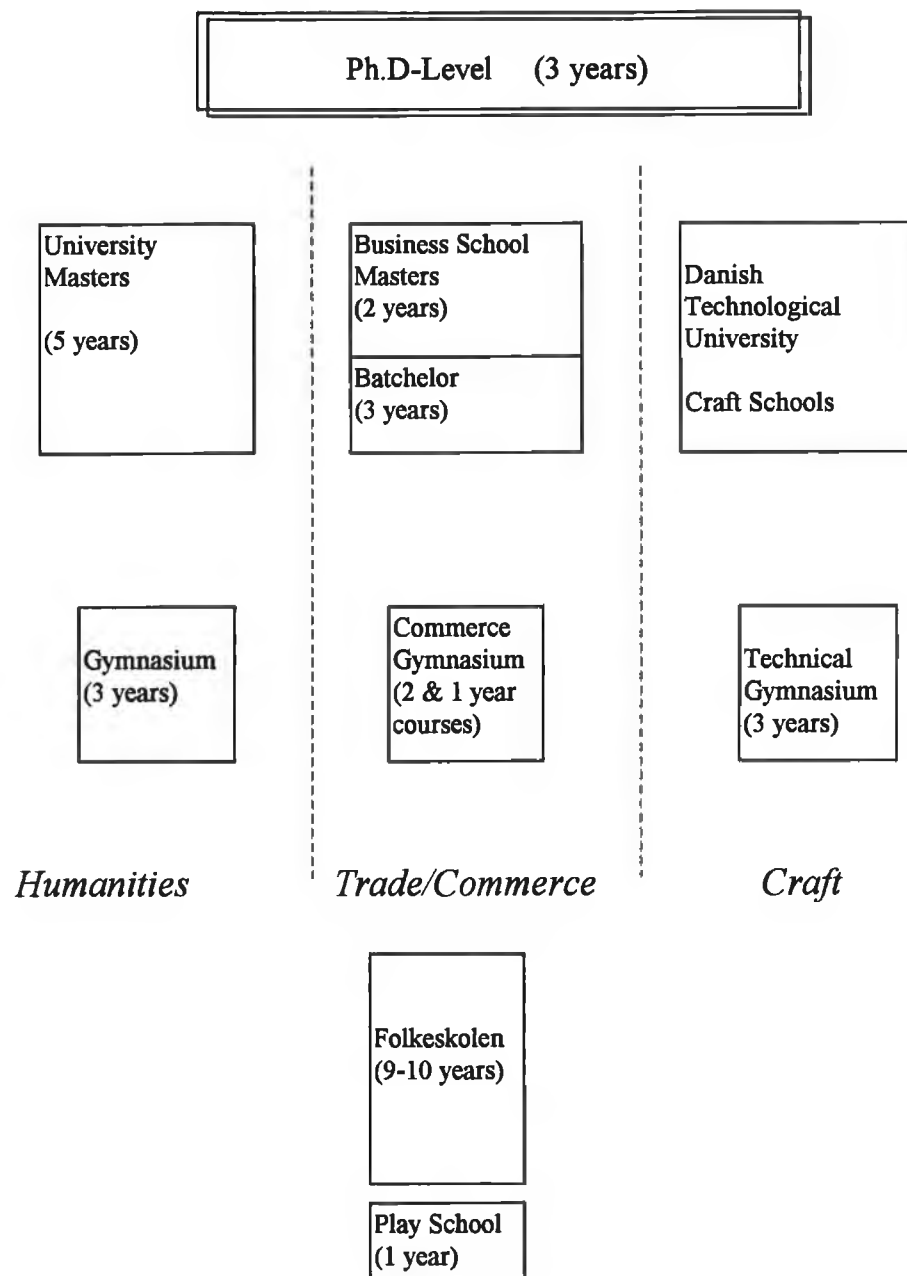
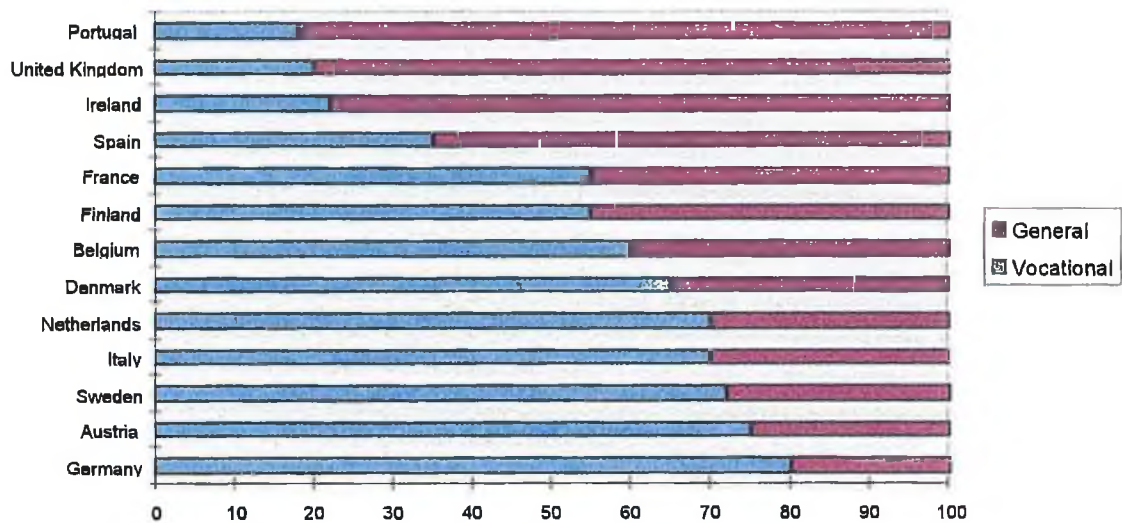


Figure 5.4 Percentage of upper secondary students enrolled in general and vocational education in EU countries (no data on Greece and Luxembourg) in 1991.



Source : Education at a glance, OECD, cited by CEDEFOP, 1995.

In our opinion the single most important factor was that the population staying in these declining areas had radically changed their technical culture or orientation. From 1950 to 1965 the proportion of a young cohort who in West Jutland acquired an apprentice education increased from 25 per cent to 49 per cent.

It seems that the factors necessary to create industrial entrepreneurs were in place by the 1960's and from these beginnings came the vocational education system that exists in Denmark today.

5.5.2 Vocational Training in Denmark

While similar to the German dual system of vocational training Denmark has introduced the EFG reform which gives students one year of basic training before they enter their chosen specialised apprenticeship. A shortage of trainee jobs now exists due, Kristensen & Petersen (1993) state, to the 'dramatic increase' in the number of EFG students. This primary year has been established to broaden the perspective of the student who will

now spend his or her first year in a regional technical school. Most regions have a major technical school complex to deal with the increase in specialised crafts. These schools were created in the 1960's following the centralisation of the educational/vocational system.

The Danish apprenticeship system offers a wide variety of options and future careers from that of 'Mester' (master craftsman) to 'teknikum-engineer' (master engineer). Horizontal mobility is a way of life in Denmark and there are always courses on offer during what the Danes regard as their 'life-long educational career' (Kristensen & Petersen, 1993). Workers can shift between different courses to gain further skills.

5.5.3 Labour Market Policy

Since the 1970's Danish labour market policy has regarded action to combat youth unemployment as being a central element. Vocational guidance, education and job training with subsidies have always been regarded as important. 'Arbejdsmarkedssuddannelserne' or labour market education is the institution that complements the vocational training system. In the 1960's courses for specialised workers existed and further training for skilled workers was available. Since the economic crisis of the 1970's job introduction courses for the young unemployed, courses for the long-term unemployed and retraining courses have been established.

Despite such initiatives unemployment continued to grow and due to widespread criticism a labour market reform was adopted in June 1993. The core elements of this were:

1. The Act on Active Labour Market Policy - to contribute to ensuring a well-functioning labour market through an active labour market policy targeted on job seekers and persons who wish to undergo education/training as well as public and private employees.
2. The Act on Local Activation - to provide offers of employment, education/training and other activation measures for persons receiving social assistance.

3. Leave Schemes - this includes parental leave, training leave, educational leave and job rotation schemes.

(Danish Ministry of Labour, 1996)

Whether as a direct result or, as a contributory factor, unemployment fell by more than one third between 1993 and 1995.

As regards adult vocational training, it is available at all stages of an individual's life due to the recognition of training as an on-going process (Danish Ministry of Labour, 1994a). The first course for entrepreneurs was established in the 1980's in Aarhus university and these courses are now the responsibility of the Technological Information Centres. Another new initiative is a support scheme for private services such as, house cleaning and garden work. Government policy is directed to ensuring that DIY and household work is undertaken by those skilled in these areas thus creating job opportunities for the less educated.

The challenge for industrial policy is thus to create opportunities for growth and employment in consumer services especially for the lesser educated
(Danish Ministry of Business & Industry, 1995, P.25).

In 1983 legislation allowed for the creation of 24 Specialised Workers Schools throughout the country and the unskilled workers union became the 'Specialised Workers Union' (Kristensen & Petersen, 1993). Today these schools are called AMU-Centres offering training opportunities to those without formal vocational education.

Kristensen & Petersen (1993) describe the educational facilities that most towns serving as regional centres have, as follows; an AMU-Centre, a Technical School, a School for Commerce and Trade, an Adult Educational Centre, Day High Schools, Folk High Schools and evening schools. However, it has been questioned by Kristensen & Petersen (1993) whether this system of continuous/further training works more favourably for those already working and 'absorbed' into it. Whether this is the case or not competition between the skilled and unskilled workers and their respective unions has increased with the development of the AMU-Centres.

5.5.4 Unionisation

Similar to other Nordic countries unionisation is very high and it is a major element of the collective bargaining system. The Danish Ministry of Labour (1994b) state that about 80 per cent of all employees are members of a trade union and almost 90 per cent of all employees are covered by collective agreements. The Danish Confederation of Trade Unions, established in 1898, and the Danish Employers' Confederation, established in 1896, are the two central organisations in the labour market. A core strength of the unions is the unemployment insurance funds as, although union membership is not a prerequisite of membership of an unemployment fund, they are closely allied to the union structure. The Danish labour force comprises about 2.8 million persons, about 78 per cent of which are insured against unemployment (Danish Ministry of Labour, 1994c).

The major strength and role of Danish unions however, is the right "to organise different jobs by pushing their members to undertake further training providing them with the skills to legitimise the unions' claims" (Kristensen, 1995, P.391). To protect their space unions have had to remain competitive and this they have achieved by placing pressure on their members to engage in further and continuous training. Unskilled workers have been virtually forced to contest skilled workers on their skills to the extent that "the intensity of further training among the so-called unskilled is the highest in Europe, while Germany shows one of the lowest intensities" (Auer, 1992, cited by Kristensen, 1995).

Continuous training for skilled workers has thus become a necessity to ensure that they are not displaced from below by the unskilled workers. Pressure from the unions, which although primarily may be for their own personal survival and growth reasons, has ensured that the system of further and continuous training has continued to play a major part in the life of the workforce.

5.6 THE DANISH BUSINESS SYSTEM

The turn of the 19th century brought the mass production society to Denmark. Acting against this however were the forces of the farmers co-operatives and the small firms which had gradually developed local networks. As mentioned previously, where farmers co-operatives were set up a railway station soon followed providing a fertile base for the birth of small workshops. Each was dependent on the other and when competition from mass producers arrived they created craft-specific schools and technological institutes to keep up to date with new technology. Thus, the Taylorist model of mass production never took root and the model of industrialisation became one of flexible specialisation (Kristensen, 1989).

Due to the strong social position that a craft worker holds in Denmark, mass production methods were short lived and a niche strategy was quickly returned to in order to keep the skilled workers. Managers during the Fordist phase protected the craft workers as they too had once entered the firms as apprentices. However after 1975 small craft based businesses came under increasing pressure. During the period 1978 to 1985, the Danish Employers' Confederation introduced the 'just-in-time' philosophy (Kristensen, 1995). As a consequence, factories in Denmark today are a 'system of mini-factories' under one roof with high discretion accorded to the workers, (Kristensen, 1995) with the power resting with the few who have the experience to work the system, the shop stewards. Increased pressure on delivery dates and quality has brought about a situation where those who are not prepared to go on training courses to increase their skills can not be tolerated and the actual possibilities for unskilled workers in Danish factories is diminishing (Kristensen & Petersen, 1993).

Good industrial relations and wage setting procedures have occurred hand-in-hand with the pursuit of a strategy aimed at quality, design and innovation. This structure and the predominance of SME's is quite unique and, while it has largely originated in the craft-movement, many social aspects have also played a major role.

5.6.1 The Social Aspects of the Firm

Kristensen (1994) describes how the institutional framework for SME's is evenly distributed, that the proportions of craft workers are evenly spread throughout the country and, that ethnically, Denmark is very coherent. A 'paradox' however lies in the fact that in the last two decades the frequency of entrepreneurship has been three to five times higher in West Jutland (Maskell, 1992, cited by Kristensen, 1994). Kristensen (1994) continues by putting forward a possible reason for such differences in entrepreneurship stemming from different feudal origins. He suggests that the yeomen of the west, who owned their own land, continued their development by setting up SME's. In contrast, in the east large estate owners played a more predominant role diminishing any entrepreneurial activity among the locals. A study of 750 young men who were asked if they wanted to start their own business showed the continuation of the east/west social divide as it was concluded that "the inclination to form an enterprise increases as you move west" (Kristensen, 1990, P.85).

Another influencing factor may be the different experiences that entrepreneurs have faced in relation to their position in the community, that is, the response of their 'spectating community' (Kristensen, 1994). On establishing a firm in the east entrepreneurs have felt isolated, while in the west the feeling has been more one of inclusion and a sense of belonging to one's community. Thus the ability and motivation for creating a new firm appear to stem from a long tradition of independence and creativity, a strong craft tradition and the social need of wanting to be respected and to belong to one's community.

5.6.2 Tight Local Networks

The network system in Denmark is built on reputation and trust and develops gradually through personal informal relationships. Firms earn their position in society by doing their work well, by offering a good price and by providing a fast and efficient service. Production systems change continuously requiring different combinations of networks to end at the desired finished product. A study undertaken by Nygaard (1996, P.6) in a

municipality in the mid-west region of Denmark found that a small sub-contractor is “part of a mainly county-based network of more than 100 firms”. Thus if a few firms enter into a formalised structured network it places limits on their sub-contracting possibilities. Thus, by stabilising the firms become rigid stepping out of the dynamic process that already exists.

Despite this, policy makers in the late 1980’s decided that Denmark held too large a population of small firms. They initiated the network programme in the attempt to join three to four firms together in particular strategic areas like export and product development. The politicians were delighted when a network between four firms was successfully initiated soon after the programme’s launch. It was later discovered that two of the firms owners were brother and sister, two had previously been employed in one of the firms and two others were neighbours. A tight social network already existed and thus they simply received funding for an activity that they were already carrying out. During the next three years of the programme the network broker did not succeed in creating one network in this region (Nygaard, 1996). In the south-east region of Denmark ten networks were successfully initiated in the face of a lack of other alternatives due to the closure of a shipyard that had been the major source of employment in the area.

Thus when faced with few other options and without much previous history in networking with each other, networks could be created. However, in most other situations even if the firm was not performing well it would still not consider entering such a formalised structure.

Such independent feelings are the trademark of Emilia-Romagna, Baden-Wurttemberg, Barcelona and West Jutland, the four regions that the International Labour Organisation named as the industrial districts of Europe. All these regions had once been the poorest in Europe and are now placed among the richest. This chapter will now turn its attention towards the region of West Jutland and more specifically the county of Ringkjøbing and the municipality of Herning.

5.7 REGIONAL INNOVATION IN WEST JUTLAND

As previously mentioned a regional redistribution of industry has occurred during the last twenty years from the east to the west of Denmark, to the extent that during the crisis of the 1970's western counties experienced growth of about 10 per cent in both enterprises and employment over the period 1972 to 1980 (Kristensen, 1990). This growth in both large and small firms was locally initiated and according to Kristensen (1990) was due to the historical dominance of SME's in Denmark, the independent stance of the self-employed farmers that had been held on to, the ensuing inherent entrepreneurship and the educational transformation in the 1950's which doubled the number taking an apprenticeship.

Kristensen (1990) has carried out wide research on this region of Denmark and believes that the reasons for the success of the knitwear and furniture districts of Ringkjobing county are as follows:

- industries dominated by small locally-owned firms,
- a strong tradition of entrepreneurship and self-employment,
- strategies aimed at the high quality design conscious export market pursued,
- the ability to make use of a decentralised structure of small specialised firms to respond flexibly to new fashions and technical specifications,
- flexibility, quality and a capacity for innovation greatly facilitated by the maintenance of a craft tradition and capability with broadly trained workers capable of redirecting their skills into new avenues,
- each district can count on a well-developed local service infrastructure,
- close family ties,
- both competitive and co-operative philosophies and practices exist side by side,
- peoples craft identity is important for connecting individuals and firms to the larger national labour market, the craft educational system and furniture enterprises throughout the country,
- the role of the iron and metal industry, the existence of a technical capability, and
- good industrial relations and wage setting procedures.

With this extensive list as the starting point it is hoped that the field study that has been undertaken will provide some new insights to the workings of this region.

5.7.1 Introduction to Ringkjøbing County

This county in West Jutland has approximately 270,000 or about 5.2 per cent of the national population. Two thirds of the county's area is used for agriculture. In recent years industrial development has been significantly greater in Ringkjøbing county than in the country as a whole. The most important industrial sectors are the clothing and textile industry, the iron and metals industry, the foodstuffs industry and the wood and furniture industry. 8.5 per cent of national production companies are located in the county.

During the past decade growth in employment has been higher than in the nation as a whole and for the last two to three years unemployment has been falling. Ringkjøbing county has the lowest level of unemployment in the country at 6 per cent. The average in Denmark is 8-9 per cent. Industry is export intensive to the extent that the county has 5 per cent of the population and 10 per cent of exports in Denmark. Finally, Ringkjøbing county has the lowest total municipal and county taxes in Denmark.

5.7.2 Industry in Herning

One hundred years ago Herning had a population of 5,000 and thus its development into a municipality of 57,000 in population would seem to have 'sprung out of nowhere'. A local brochure entitled 'Herning - Opportunities For All' states that;

The germ of this growth and development to a modern industrial town lay deep in the mentality of the inhabitants of Central Jutland - in their energy and initiative.

Today a large number of commercial and industrial activities, such as the textile and clothing industry, data processing companies, metal working industries, wood and furniture production and processing industries, can be found in Herning. Herning has

720 companies with more than 5 employees and 32 of these have more than 100 employees. In 1994 the number of employed people stood at around 31,200 (Herning Kommune, 1996). Of this approximately 2,000 are employed in the metal working industry, 1,500 in wood and furniture production, 4,300 in textile companies, 1,300 in processing industries and 2,000 in the transport sector. Herning has a Congress Centre and the Exhibition Centre Herning which is the largest exhibition facility in Scandinavia. Also, situated in the east of Herning is the Birk Centerpark where business, technology, culture and education can be found working hand in hand on a professional basis.

In terms of infrastructure, Herning is very well connected with 20 daily flights to Copenhagen, cutting the journey to 1.5 hours, and 21 daily train departures.

Firm Structure and Strategy in Herning

Textilindustrien is funded by industry, represented by the producers of textiles and clothing, and thus their strength does not come from public funding. 350 companies are members of the Federation with approximately 200 coming from the Herning region due to the fact that 70 per cent of all clothing and textile industries in Denmark can be found within a 40km radius of Herning.

In 1991 production occurring outside Denmark was not contemplated. Today the Federation's rule which stated that members must produce most in Denmark is being changed in line with a change in attitude towards moving production to lower cost countries. The feeling also exists that Herning must become more aggressive in its drive to conquer new markets. The Federation is currently undertaking an export drive in St. Petersburg and plans to concentrate on Japan in 1998.

A guide published by the Federation (1996, P.7) stated;

Our industries are well known for the ability of being close and loyal to the customer in every matter of trend-setting design, quality and quick response. Skilful work in the expected quality at the expected time of delivery is the

philosophy behind these successes of export that in 1995 reached two thirds of our production at the total amount of approximately DKK16 billion.

Femilet A/S, a firm specialising in lingerie in Herning predicted that by the end of 1996 it would have grown from DKK70 million to DKK95 million and it is continuing to expand based on its well established reputation for quality. However, like many clothing firms in the area the sewing process has moved eastwards to the extent that the 235 cutters/sewers once employed in Femilet have dwindled to three. Today production occurs in Lithuania and Poland. Femilet still designs and sources its own fabrics and in Herning the staff of 58 consists of administrative personnel, sales people and designers.

It is important to distinguish here between the textile and clothing industries. That is, the textile sector is capital intensive employing mostly males who received technical and trade educations, while the clothing sector is labour intensive employing mostly female seamstresses who would have received little, if any, formal education. Thus it is apparent that current job losses are largely being experienced in the clothing sector as the sewing tasks are being being moved to lower cost countries. However such production moves will impact on the textile industry in the near future, followed by the wood and furniture industry.

This loss in employment has not caused widespread concern in Herning. Only 12 per cent of the workforce in Herning is engaged in textiles and unemployment remains low. There is a belief that the loss in employment will be compensated for in other ways, although as yet, it appears unclear in Herning where exactly the new jobs have been found. The possibility of expanding employment in Denmark from the benefits gained by producing in a lower cost country also exist. For instance, a Danish firm that moved production to Poland doubled its employment in Denmark. However it is unlikely that this employment made use of the unskilled worker whose job is now in Poland.

Unimerco A/S is one of the largest grinding facilities and manufacturers of customised cutting tools in the world and collaborates in R&D and in marketing with some of the world's leading manufacturers of machine and cutting tools. Unimerco is unique not

just to Herning but to the whole of Denmark as the shares are owned by the local employees ensuring that all are working towards a common goal. Unimerco sells specialised knowledge with the employees trained internally. Due to the high level of skills held by the employees and the uniqueness of their tasks it is not the type of firm that will receive competition from the low cost countries.

Unimerco is involved in a large overseas expansion programme with their sights currently set on the UK market. Unimerco is not resting on its successes and is currently looking at the areas of measurement and calibration. The firm remains open and willing to change to the extent that it accepts that regrounding in ten years time may not be its prime task. Instrumental to Unimerco's success has been its corporate culture, where management work very closely with the employees, and the involvement of the customer as a partner.

Femilet and Unimerco were not immediate successes when they started and they produced many different products before finding their particular specialty. It was the determination and perseverance after a failure that ensured future success. Many firms in Herning remain traditional and old-fashioned, unwilling to take on an outsider who would have more knowledge in particular areas such as marketing and export, although their resilience and adaptability remains a strong feature of the area.

Moving from production firms, *Green City Denmark A/S* has Herning as its headquarters. It was established by the government in 1993 as a window to the world for Danish environmental technology and know-how. Its expertise primarily lies within systems for, water/waste water, waste management/recycling, energy supply, green manufacturing/cleaner technology, agriculture, town/urban ecology and transport/local traffic. The company is attracting new firms to the area and contributing to all year round tourism due to visiting delegations. For example, 6-10,000 people visited Green City Denmark in 1996. They will spend DKK2,400 a day and their average stay is 4.2 days. This year alone four delegations traveled from Ireland to gain information on wind energy and waste management.

From all the descriptions to date it appears that Herning is extremely environmentally conscious and without doubt many firms are striving to reduce emissions and water usage and hold the ISO 9,000 and British Standard. Danes believe that if they did not have to get consensus from the EU their legislation in relation to environmental matters would be more advanced. Green City Denmark however has to show monetary savings before firms will engage in more environmentally friendly avenues. To date only one firm has moved into HI-Park which has now been open for two years. The park has very strong environmental controls which appear to be a disincentive to many firms. The rent is also quite high due to its green nature and with production moving overseas it is quite easy for new firms to find cheaper empty space in Herning. In general young students do not appear to be that interested in environmental matters, regarding it as too expensive and believing that the officials have gone too far. There is no doubt that Denmark will remain in the forefront of the expanding environmental industry but Denmark is also home to young struggling entrepreneurs who regard the expense as just another obstacle to the creation of a new firm.

5.7.3 The Herning Administrative System

Local government, the Chamber of Commerce and the Technological Information Centre represent the principal development bodies in Herning and a description follows of their respective roles and the current activities in which they are involved.

Local Government

The role of the local government has been extended to include regional development and Herning Municipality is now quite active in this area. Local government generally follows the initiatives taken by central government. Although the municipal plan is renewed every four years Herning reviews its progress every year so that amendments, if needed, can be made. In 1990, market research carried out among 200 companies revealed that trade and industry companies do not think in terms of borders of municipalities. This resulted in the development of close collaboration between Herning and Ikast, the municipality to its east.

Many action and development programmes have been instigated in the first half of the 1990's with the overall vision of creating a healthy environment for its inhabitants, improving infrastructure, education and information and advice services, and to becoming a dynamic area for trade, business and entrepreneurship.

It is quite unusual in Denmark that two municipalities will co-operate but this they have done with the development of Herning-Ikast (HI) Industrial Park to allow firms to be established in an environmentally conscious area. The fact that the park is placed on either side of the border between Herning and Ikast however, gives the impression that one is not prepared to give more than the other and illustrates that their independence remains strong. This new co-operation is but in its infancy and therefore the investment by each of DKK10 million for the development of HI-Park, a figure which was met by a regional private bank, is worthy of note.

Following a suggestion from the Ministry of Industry to develop new forms of collaboration Herning and Ikast joined with five other municipalities in their county to create a 'knot centre'. Up until this collaboration each municipality had promoted itself when trying to attract outside companies. Now there appears to be the beginnings of a 'think bigger' approach as they have joined together for industrial development and policy formation. Today there is a local belief that they need to regionalise certain issues, to look further than the municipality border, not to simply concentrate on their own locality. These new moves signal the possibility that the county's 18 municipalities may one day join to become three as the remaining municipalities in the county are also forming into two collaborative groups. There is the obvious advantage that through such co-operation the weaker regions might be better supported by the richer but conversely, such joining will add a new layer above the municipality where plans must receive agreement before going to the county level.

At present this new knot centre is being developed cautiously as there must be the fear that the size and the strength that this new layer could acquire could cause the alienation of the local communities. Created in the summer of 1996 it is too early to evaluate their contribution and the role they will hold between the municipality and

county level. They are unique in Denmark at present and represent an interesting level - a form of sub-regional level - in which industrial policy can be discussed and formulated.

Finally, in 1997 the creation of a town-network as a centre for the whole province is being proposed between the four biggest towns in the county, Herning, Holstebro, Struer and Ikast.

The Chamber of Commerce and Industry

Herning and Ikast joined to become one chamber at the beginning of 1996 to strengthen their position in the development of the area, in particular the development of textiles. This amalgamation is again the first of its kind in Denmark.

The chamber plays a very active role in local development and an organisation of this kind in other municipalities is called the 'Industrial Development Office'. All chambers are very different, as for instance some have tourism functions, and simply their form and structure reflect how they develop themselves. There is no nationwide standard of a chamber of commerce. Thus, the chamber of commerce for Herning-Ikast can be better termed the 'Local Business Development Council'. This chamber is regarded as one of the most active in the country.

The role of the chamber is about to change. In previous times it was mainly a source of information for its 500 (approximately) members. The chamber publishes a monthly newsletter that highlights information especially that coming from the Department of Industry. The chamber is now entering a period where it will concentrate more on projects and in particular on how to attract foreign companies, and to both educate more and to upgrade the actual education available in the area. The Business Link Programme in Central Jutland, the inspiration for which came from a similar programme in the UK, is an example of a current programme that the chamber is undertaking.

The European Information Centre (EIC) and the Technology Centre MTC are located within the chamber of commerce.

There are eight EIC's in the country. The host organisation may be the county level but in this case it was simply the chamber's efforts that gained it its right to host the EIC which gives advice and information to SME's on EU matters in Ringkjøbing county. The Technology Centre MTC specialises in giving impartial advice and guidance to companies in matters relating to cleaner technology, environmental and quality management.

Technological Information Centre-Holstebro

The role of the centre is to develop industry in the county. Like the chamber its attention has shifted from individual firms towards specific projects. The TIC's target group is small companies within industry and crafts and its role lies in providing valuable information and motivating owners to start developing their companies. The TIC seldom attracts the young impetuous entrepreneurs who will simply 'go for it'. More often their client is older and more cautious wanting to evaluate an idea fully.

The achievements of the TIC's created in 1970 are, however, hard to quantify and as the state requires them to justify their existence, their budget is being cut back.

These organisations represent the basis of effective development planning and information transfer in the area.

5.7.4 Support for Firms in Herning and Overlapping

The local support structure for industry in Herning is regarded by its inhabitants as being one of the most supportive, innovative and open-minded in the country. Industry can receive information and advice from many sources which includes the local government, the chamber of commerce, the TIC, the Euro Info Centre, the Technology Centre, Teko, the Herning Institute of Business Administration and Technology, the textile and wood technology departments of the Danish Technological Institute (DTI), EURA A/S, a county based development agency and many private consultancies.

Firms are often confused by all the different agencies and it is accepted that there is a degree of overlapping. For instance, the TIC, the DTI and the Herning Institute of Business Administration and Technology (HIBAT) are all trying to transfer their knowledge to the SME's. Overlapping is also evident in the provision of EU information. A report entitled "Business Policy for the County of Ringkjøbing" showed the overlap which exists between the Chamber of Commerce, the EIC and EURA A/S. Rather than emerging from the recognition of a duplication of administration costs, internal territorial issues are evident and any future rationalisation would be strongly opposed by the respective parties. In fact, due to this overlapping another organisation called the Centre of Commerce for the Middle of Jutland was established in 1996 to co-ordinate all the rest.

Different people's experiences obviously give different impressions of the banking system in Denmark. The HI industrial park is a common project where one third of the capital needed was invested by the regional bank providing an example of a bank which is very conscious about helping local trade and industry. They also give grants for art, culture and sport in the area. Due to the fluctuating nature of the textile industry it appears that the banks have been willing to take risks due to their local knowledge. However banks obviously prefer stronger companies, they require security and a good business plan which new firms are often unable to produce.

Currently a large campaign to reduce red tape exists as the heavy bureaucracy is stamping out private initiative resulting in a minimal start up rate for new firms. A government initiative in which a company and a bank will invest money into an investment fund to help risk taking has just started and entrepreneurs can avail of this fund. It has moved from a government to a business perspective as it is the business people in the proposed area in which the business idea originated that decide from their own perspective and knowledge of the market whether funds will be given. It is expected that more programmes like this will be set up as entrepreneurs become fewer.

5.7.5 Vocational Education and the Third Level Sector

Education matters remain a top priority in Herning and are more important than ever due to the dramatic decrease in entrepreneurship that has occurred in the region. The present generation are not attracted to running a business, now preferring safety and to be employed. In response to this the government has initiated schemes whereby the grammar schools are trying to introduce students to entrepreneurship. In Herning it has been introduced into the gymnasium where students are told of the opportunities that exist in having your own idea and setting up your own firm. However it has been discovered that first, the teachers have to be convinced as they might be recommending an 'easier way of life' to them.

Although the craft tradition is still very strong in West Jutland those who show the most potential academically travel to universities in the east. Many do not return to the place which those in the east describe as being bleak and desolate. Herning, for example has a shortage of doctors but finds it very difficult to attract them from the east. The format of the apprenticeship system has also been the subject of recent debate. Due to the transfer of production processes to lower cost countries the situation has arisen where it is necessary to send some of their apprentices to Germany to receive training. Also, since 1972 it is possible to become an engineer without having a craft education and consequently a mixture of practical and academic engineers now exists with, it appears, little communication between the two systems. Although the apprenticeship system is still very strong in the commercial field an increasing perception now is that it is not so desirable to work with your hands.

Despite these obstacles Herning has proved resilient and highly innovative in the education bodies that it has established to ensure the future survival of industry.

The *Danish Export Institute* was founded by local initiative in 1979 with the aims;

- to train students to a high degree of professionalism in export and international marketing.
- to give an education that has both a vocational and liberal character.

In addition to the central core of export and business studies, the education also covers broad aspects of cross-cultural communication and adds the dimensions of politics, religion and history to the curriculum. This practical ability to discuss other topics shows respect to the host and therefore in turn the host will be more positive. The Institute now receives about 60 per cent of its budget requirements from the Danish Ministry of Education and has been placed under the Business Schools division of the ministry.

Such private initiative was also responsible for another unique school called *TEKO Centre Denmark* which has clothing, dying, knitting and textile as its four main areas of study. Skilled workers were once the largest group but now only represent 20 per cent of the education carried out in Teko. In Denmark as a whole 12,000 seamstresses have now become 3,000. Student numbers in higher education and subsequent additional training have increased by more than five times in Teko and they hope to begin new courses in Clothing Design, Textile Design and Pattern Design through English before the year 2,000. Teko believes that the future is in further education and that the textile industry will survive in Herning by improving in textile and pattern design. The students are closely linked to industry as the textile firms in the area have students for a training period and the students' final task takes place within the firm. 70 per cent of Danish textile firms are located in the area while students come here from all over the country and Europe.

The Herning Institute of Business Administration and Technology resulted from a merger in 1995 of the Herning Business and Engineering Schools and incorporated a third department, that of foreign languages. The Institute's main aim is to teach students how to integrate learning and skills in computing, accounting and languages. The Institute trains its students for SME's and as a part of their course they will undertake firm specific projects. In Denmark the masters award is regarded as the completion level in a university education as compared to Ireland where it is the bachelor award and a masters is regarded as further third level study. Herning Institute currently awards up to bachelor level and thus finds it difficult to keep its most

promising students as they will move to a university where they can study to masters level. Consequently Herning is trying to gain a course that awards a masters but is facing opposition from the larger education institutions. Herning has again developed its own unique institute catering for its particular needs which are firmly in the field of further education and SME support.

The four biggest towns in the county wish to plan education together with the simple general aim of keeping what they have (Herning lost a teacher training school due to the lack of students) and attracting new courses and schools. Firms in the area are currently partaking in information days, in order to ensure a continuous pool of relevant graduates. Second level students are shown around their businesses in an attempt to encourage them to enter this particular career path. Firms are investing considerable time in this activity as a preventative measure against future skill shortages.

Herning stays up to date with new course requirements through dialogue with the business firms and firm representative bodies such as Textilindustrien, the Federation of Danish Textile and Clothing Industries. The Federation has a link with the different schools and knows from its members what courses are needed and what courses are now obsolete.

5.7.6 Linkages and the Social Structure

Different forms of linkage have been previously mentioned, notably those between Herning's education institutes and the firms in which their students are placed. The local authority and the chamber of commerce are engaged in joint projects as are the chamber and the TIC. Linkage between firms through subcontracting and joint projects are evident even though the TIC feels that more networking would be beneficial to all in Herning.

An interesting linkage in Herning is the cross representation that takes place on the different boards. The manager of Femilet is on the board of the chamber of commerce, the president of Unimerco is on the education boards and is involved on the board of

the chamber of commerce as well as being the president for the local owners of companies. Textilindustrien has strong links with the Teko Centre and is represented on the boards of craft/technical schools specialised in textiles, and business firms are represented on the Herning Institute board. This represents only the surface of a maze of inter-connectedness that exists in Herning.

Herning has a group of 200-250 people that are the town's 'social elite'. Each know, or know of, each other and once one has proven oneself worthy entry is gained to a circle of all important contacts. Thus, through regular formal and informal meetings ideas and policy directions can be discussed by people from many varied sectors all committed to the development of Herning. How inclusive this society seems from outside the elite circle must obviously be questioned even though the consultation process emanates from local council meetings.

From the above description it is evident that Herning has kept its small town feel where all know each other. A strong local culture exists and the citizens are very involved in local activities. The level of voluntary involvement is immense. Every Dane on average is a member of twelve organisations and this strong local engagement is not unlike the 'joining syndrome' found in the industrial districts of the Third Italy and Silicon Valley in the US. Centerpark in Herning is home to the chamber of commerce, Teko, the Herning Institute and many other organisations and firms. It is not unlike Silicon Valley in its social structure which promotes clubs for students, clubs for employees and a club for the leaders of the twelve different organisations that can be found in the park. Also, a club is currently being formed for people working in Birk Center Park. Herning also has its own museum, theatre and town band. While Herning municipality is approximately 57,000 in population, 40-50 thousand theatre tickets are sold each year. Private initiative is the key to the developments that have occurred in Herning where instead of waiting for central government to provide the necessary funds they have invested in their own future by building such facilities. Herning due to its relatively small size has the support and trust of its people thus ensuring continuous advancement.

5.7.7 Cultural Affiliation

Danes in general have a stronger affiliation to their city or municipality than to their county. This obviously stems from their strong commitment to their locality, their family and friends. The regional authorities do not hold as much power as the local authorities which also remain fiercely independent. Thus it is clear that regional agglomerations within the county have emerged out of strong local cultures which are only recently moving to a more regional level of co-operation through the afore mentioned 'knot-centres'. Therefore, local independence which has been the key to so much of Herning's success may limit the benefits that could be achieved from greater regional co-operation.

Upon moving to a national level inhabitants of West Jutland believe that they have more in common with other regions in Europe than they do with the east of the country and in particular Copenhagen. The west regards Copenhagen as very bureaucratic and inward looking. In contrast, industrialists describe the special way that Herning has at looking at progress and their reputation for being hard workers. In consequence, most firms are very active locally, while at the same time focused on the international market. They are local in their way of thinking but internationally focused. Herning remains in touch with international happenings and the importance placed on foreign languages in the education institutes is evidence of this receptiveness to the outside world.

Localisation Vs Centralisation

North west of Herning, Sinding-Orre, which comprises two villages with a total population of 900 inhabitants, can be found. Depopulation due to the mechanisation of agriculture awoke local initiative to save their community. The Community Association which was formed in 1974 is the catalyst and coordinator of most of the public activities in the two villages through its 400 members. Sinding-Orre has about twenty associations which created the local Council for Sinding-Orre in 1987. Today, the two villages have a school, a day care institution, an evening school, an open

university, a windmill co-operative, biogas plants, co-operative housing, allotment gardens, 20 associations, local councils, a local newspaper and seasonal festivals as part of a viable and dynamic community.

Local initiative, solidarity and co-operation with the municipal authorities has enabled numerous initiatives towards the overall objective : survival as a viable community and improving the quality of people's lives (Ministries of Environment & Energy and of Housing & Building, 1994, P.70).

This example of a small community in the municipality of Herning illustrates clearly that the old entrepreneurship and initiative that led to the farmers' co-operatives almost a century ago is still present in the people of this region. 150 years ago there was no town in Herning, firms in Herning never relied on public funding to support them through tough times and thus the toughest have survived and have become stronger.

Herning has invested considerable funds in education and schools and continues to do so as the current discussion concerns how skills can be upgraded to match the highly skilled jobs that exist today. Herning, like the rest of the country, is a very equal society, whose people continually strive for the improvement of their community as a whole. Herning's success appears to derive from its small flexible firms, its progressive education system and its own private initiative where private money has been invested in local services. The inhabitants of Herning have confidence in their own ability to adapt and survive, an asset that no international force can destroy.

5.8 CONCLUSION

Denmark, today, is a dynamic and forward looking nation with a highly developed industrial sector. Over the last century Denmark has developed its traditional industries into such fields as, biotechnology, logistics and calibration. The state has played a major role by inducing demand for these products, especially in the field of environmentally friendly technology through stringent environmental policy. Though social consensus and equality are a central part of Danish life the country is not without its own social problems. For instance, Denmark has one of the highest rates of suicide

in the world and there has been recent evidence of youth community tension through the escalation in fighting between two biker groups in Copenhagen.

Counties vary greatly in the role that they take in relation to regional development and economic policy. It has been seen that, to a large extent, regional policy is the sole responsibility of the counties and municipalities with little direction or aid given by the central government. Regional development is carried out and consequently it is always local needs and wishes that are being addressed. The 'knot centres' in Ringkjobing county appear to be a local manifestation of regional policy, whereby poorer municipalities which have difficulty providing a high level of services for their inhabitants are joined to the richer and may become engaged in co-operative projects that will aid the development of their own area.

Such grouping also increases the pressure on the state to allocate regionally located higher level education to ensure that western parts of Denmark do not continue to lose their most promising students who often never return after gaining their education. The dramatic fall in the number of entrepreneurs and in the rate of new firm start ups will represent Denmark's major problem over the next number of years. The policies being adopted to combat this situation appear to be, investment funds for entrepreneurs, courses in entrepreneurship, information talks to secondary students on the benefits of setting up your own firm and an attempt to reduce the red tape surrounding the whole process. According to Mjoset (1992) the family farm is also having problems of over-investment and more importantly a younger generation which is not committed to continuing the family farm which was once such a strong factor in the Danish innovation system. In many parts of Denmark the 'wage-earner' mentality is becoming dominant.

As a spur to development, Herning has concentrated on its physical infrastructure developing Centerpark and gaining a motorway which will run right beside the park. The fact that only one firm has moved into the park to date demonstrates clearly that having the infrastructure does not ensure that firms will automatically follow. There are many social aspects to the creation of a firm and firms that move from one area to

another are often those that are not embedded in a functioning network. Centerpark must be careful of the established firms that it attracts to ensure that they are technologically and socially active.

From this study of Herning it is evident that, despite many obstacles that it has faced over the years, it has maintained its core strengths of independence and adaptability. The people of Herning and the area of West Jutland have developed their own specific institutions and organisations to suit their particular needs and, most importantly, development has originated out of local initiative and local funds. A strong vocationally based education system exists, there is a strong network of interconnectedness and local commitment and a system of local autonomy is in place to ensure local decision making. Denmark's local system is based on trust, openness and solidarity and it is essential that the country holds onto these qualities as it faces an ever increasing competitive world.

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CHAPTER SIX
THE MID-WEST REGION
OF IRELAND

6.0 INTRODUCTION

The Mid-West region, comprising the counties Clare, Limerick and North Tipperary, is one of eight statutory regions in Ireland. The region has about 10 per cent of the national land area and in 1996 the population stood at 317,000, 8.8 per cent of the national total (Fitzpatrick Associates, 1997). With a population of over 75,000 people, Limerick City represents the regional population centre. When joined with Shannon and Ennis, the next two largest towns, a core 'triangle' of development in the centre of the region emerges. This core contains over one third of the population and is a hub of urban facilities, industry, infrastructure, communications and education (Mid-West Regional Authority, 1996).

In 1995 unemployment in the region stood at 10.6 per cent compared to the national average of 13.2 per cent. However, this average masks a number of unemployment 'blackspots' such as West Clare at 25 per cent and parts of Limerick City where unemployment is reaching levels of 80 per cent. The Mid-West was the only region placed in the category of 'developed high performer' following the mid-term evaluation of the regional impact of the Community Support Framework (CSF) for Ireland over the period 1994-1999 (Fitzpatrick Associates, 1997). This means that the region was already relatively strong economically in 1993 and performed above average during the period 1994-1996. Notably the region is ranked third in terms of CSF expenditure per capita and the total projected CSF expenditure in the region from 1994-1999 is £1.25b (Fitzpatrick Associates, 1997).

The Mid-West is rich in both natural infrastructural endowments, for example, Lough Derg and the Shannon Estuary, as well as in physical infrastructure, for example, Shannon Airport and the Shannon Free Zone. Indeed the region is characterised by the extent and innovativeness of infrastructural projects and industrial programmes that have been undertaken there. The beginnings of these developments can be traced to the establishment of the Shannon Free Airport Development Company (SFADCo), now more commonly known as Shannon Development, in 1957 with a remit to increase the volume of traffic through Shannon Airport and to attract foreign direct investment to

the Shannon Free Industrial Zone. Shannon Development was and remains the only autonomous regional development agency in the country. The driving force behind these achievements was a number of innovative individuals such as Brendan O'Regan whose vision and determination led to change and development in the region.

Subsequent developments include the establishment of a Mid-West Regional Development Organisation in 1966, a model which was subsequently extended to the rest of the country but arbitrarily abolished in 1987. The establishment of the National Institute of Higher Education (now the University of Limerick) in the early 1970's was the first of its kind in Ireland and was specifically oriented towards business and technology. By 1978 Shannon Development was granted a pilot role in the development of small indigenous industry and an Innovation Centre for small businesses was opened in 1981. This Centre represented the first initiative in the development of the National Technological Park which today comprises a 650 acre site on the banks of the River Shannon. With the University of Limerick at its core the Park has more than eighty separate organisations which employ over 2,100 people (National Technological Park Ltd., 1995).

The establishment of the University of Limerick, the National Technological Park, the Regional Development Organisation and the Innovation Centre represent local initiatives that have been or are being adopted on a national basis and illustrate the region's reputation for innovation. Though the 1990's has not been marked by a major innovative project it remains the prime testing location, and often the instigator, of pilot programmes in the country.

Firstly, this chapter will provide a brief overview of industry in the region. A review of four current initiatives that are being undertaken by industrial development agencies in the region will follow. This will be complemented by a critical analysis of the effectiveness, efficiency and co-ordination of the various organisations in the region. In turn, this will be used to assess whether the public, private and voluntary sectors are working towards a coherent regional strategy. Observations and conclusions will be

derived from a review of the current literature and from semi-structured interviews undertaken with the key players in the Mid-West region (see Appendices A and B).

6.1 INDUSTRY IN THE MID-WEST

Light industry particularly in the electronics sector, traded services, instruments, metals and engineering dominate the region's industrial base.

There are approximately 700 indigenous companies and 140 overseas companies in the region. Engineering, electronics, food, clothing and aviation-related services are the main indigenous industry sectors, while electronics, communications and computing technologies dominate overseas industry (Nolan, 1996).

Over 5,500 people are employed in the Shannon Free Zone in the electronics, aerospace and equipment manufacture sectors, with strong growth reported in international services. Electronics/instrument engineering was the fastest growing industrial sector between 1990-1995 and overall employment in the region's industrial sector grew by 33.7 per cent during the period (IBEC, 1996). Employment in indigenous industries in the region, such as the food industry, declined significantly during the eighties but this trend is being reversed. Overall, employment in Irish-owned companies increased by 12.4 per cent between 1990-1995 compared to the national average of 2.8 per cent (IBEC, 1996). This trend seems set to continue following the recent announcement by the Minister for Enterprise and Employment of plans for 27 companies in the region, backed by Shannon Development, to create 800 new jobs within the next three years. Almost 500 of these jobs are being created by Irish-owned companies (O'Keeffe, 1997). The announcement in total unwrapped plans for 1,400 new jobs in the region predominately located within the 'Golden Triangle' with the largest single project located in Ennis. Over the same period, 18 foreign start-ups and 17 closures led to a net employment increase of 1,530 jobs and 85 Irish start-ups and 156 closures resulted in a net gain of 190 jobs (Insured, 1996). This clearly illustrates the high failure rate of firms in the region, particularly in the indigenous sector.

The region remains heavily dependent on multi-national corporations (MNC's) for its continued success, with foreign-owned manufacturing plants accounting for 55.7 per cent of industrial employment compared to 46.8 per cent in the country as a whole (IBEC, 1996). When MNC's were asked by IBEC why they originally came to the region, the top four reasons given were; the airport, skilled labour, the 10 per cent corporation tax rate and grants. Today services at the airport have disimproved, the cost of labour is less in the UK and the future of the corporation tax rate is unsure after 2010, a critical factor for the future attraction of inward investment.

Infrastructure and in particular the road network and Shannon Airport, constitute the two major areas in the region which firms regard as in need of attention (IBEC, 1996). While the road network is being upgraded this needs to be intensified and the need for more public spending on physical infrastructure, especially on non-urban roads, has been recently recognised (ESRI, 1997). Shannon International Airport lies at the heart of the second major exporting region in the country but has only four flights a day on average to Dublin, five flights a week to London, three flights a week to Belfast and one flight a week to each Paris, Dusseldorf and Zurich. The flights to both Dublin and Belfast include transatlantic flights that will have picked up passengers in Shannon. However, without daily flights to the Continent business people from the region will first have to travel to Dublin by road or rail to get a flight on the day that they require.

There is a lack of firms with an R&D and marketing function in the region but recent efforts are improving this situation, albeit slowly. An expansion of the sub-supply sector has also been experienced due to the improving quality of indigenous firms. However, further development of the indigenous sector is required as foreign-owned industry still provides a higher level of output and added value (Mid-West Regional Authority, 1996). A major problem lies in the fact that firms often do not see themselves in need of training when in fact management skills may be quite low with the ensuing tendency for SME's to under-invest in training (Department of Enterprise and Employment, 1997). Tipperary (NR) County Enterprise Board have identified such a lack of marketing and planning expertise and have started a management development course on computerised management accounting.

While the Mid-West can lay claim to a historical spirit of innovativeness and development most of this was centred in a few key players in the region. A strong culture of enterprise does not permeate throughout the region and Tipperary (NR) is described as being particularly undeveloped in this respect. Indeed, the region needs to develop new ways of thinking in regard to the creation of new firms, based on the formation of entrepreneurial attitudes within the community from an early age. Such attitudes take shape through the presence of certain features (see Chapter Four P.103) and most notably through the presence of local autonomy and a strong vocational education sector.

The need to provide support, improve competitiveness and raise the level of R&D, which is carried out by only 24 per cent of foreign firms and 12 per cent of Irish firms, has been identified in the region. Four current programmes which are currently in place to address industry needs in the region will now be discussed.

6.1.1 Current Programmes/Initiatives

The Shannon Regional Innovation Strategy (SRIS) and the Inter-Firm Co-operation Network Programme are two new programmes in the region. The first aims at improving co-operation between the public, private and education sectors and to provide a framework for the development of policies at regional level. The second aims to improve networking between firms. Due to their infancy only a brief discussion can be provided. On the other hand, the Programmes in Advanced Technology (PATs), which deliver key technologies to firms in Ireland, and the Techstart Programme, which aims to raise the technological capabilities of firms, will be discussed in detail in order to identify their importance and effectiveness in the region.

The Shannon Regional Innovation Strategy (SRIS)

The Shannon region¹ is one of 19 regions in Europe chosen to undertake a 'Regional Innovation Strategy (RIS)' over the period 1996-1998. The RIS "aims to improve the capacity of regions to innovate, providing a common framework for innovation policies at regional level" (Shannon Development, 1996, P.2). The region is to follow a broad process of investigation and consultation within a common framework adapted to local conditions. Shannon Development is the project leader with participation of the private, public and education sectors. In comparison with the other EU regions selected, the SRIS has developed faster. This has been attributed to the pre-existence of co-operation among agencies on various other initiatives. The SRIS is also among a minority of regions which selected a chairperson from the private sector.

The SRIS is to be driven by private sector wants and it hopes to develop new methods by which schemes can be delivered more effectively to industry. While the SRIS has provided a forum for the discussion of issues on a regional level it believes that it must ensure that any final proposals/suggestions are practical and relate to the needs of individual firms, while being consistent with national policies and programmes. If not, the outcome will simply be another report which neither contributes to the development of firms, nor is implemented in the region.

The Inter-Firm Co-operation Networks Programme

Government reports on industrial policies in recent years (Culliton, Tierney) have commented favourably on the Danish Network Programme, describing it as being successful. Thus it was no surprise that a similar programme was piloted in Ireland by Forbairt at the end of 1996. The objective of the programme is to bring indigenous firms together to co-operate in strategic activities such as product/process development or marketing.

¹ The Shannon region incorporates the additional counties of North Kerry and South Offaly.

In reality, this programme is based on the largely unsuccessful Danish Network programme which has now been terminated. The programme achieved success in only one region and although the concept was initially thought to be highly promising, Danish academics now warn against transplanting this programme to other countries without careful adaptation to the specific needs and set up of the individual country and its regions.

A thorough examination of networking in Irish industry may be necessary to discover the extent of formal and informal networking and an attempt then made to cater for deficiencies in either or both when located. Problems need to be identified at ground level. Only then should other EU initiatives be examined as an aid in the choice of the most appropriate way forward.

The Programmes in Advanced Technology (PATs)

The Programmes in Advanced Technology (PATs) were established as a national programme to develop third level research capability, to deliver key technologies to firms in Ireland and to attract overseas investment in high technology areas. The PATs are based on technologies which are considered to be of strategic importance to Ireland and they have been developed out of a concept of partnership between the universities, industry and the State.

Following the recommendations of the Tierney Report, the PATs are now to be established as a subsidiary company of Forbairt. The Minister of Science and Technology will lay down the strategies to be implemented on the recommendation of a standing board. Currently the PATs employ over 500 people nation wide and this includes over 200 post graduates (Dept. of Enterprise & Employment, 1996). Currently seven PATs are in existence and are located in 36 separate centres which are almost exclusively third level based (see Figure 6.1). Each centre has its own specialty within its particular PAT. In 1996 the expenditure budget was almost £20m. Over £11m of

Figure 6.1 Programmes in Advanced Technology

Colleges/ Programmes	TCD	UCD	UCC	UCG	DCU	UL	Forb- airt	NM- RC	NI- MT		Number Employed	Public Funds & earned income 1996
AMT Ireland		✓		✓		✓					41	2.5m
BioResearch Ireland	✓	✓	✓	✓	✓						299	6.8m
Materials Ireland	✓	✓				✓	✓				34	1.5m
Optronics Ireland	✓	✓		✓	✓			✓			44	0.79m
Power Electronics Ireland		✓	✓	✓	✓	✓		✓			47	1.9m
Software Ireland					✓	✓			✓		38	1.8m
Teltec Ireland	✓	✓	✓		✓	✓					73	2.1m

Source: Adapted from Forfás, 1996a

this was income earned from industry (this included indigenous, foreign domestic and overseas companies), EU contract research under the Fourth Framework Programmes and research conducted for semi-state bodies in the country. Research conducted for industry represented over 50 per cent of earned income. The balance of £8.6m came from the State and 75 per cent of this was financed through the Structural Funds (Dept. of Enterprise & Employment, 1996).

The seven PATs were established in the late 1980's and early 1990's. They are as follows: BioResearch Ireland, Advanced Manufacturing Technology (AMT Ireland), Optronics Ireland, Power Electronics Ireland, Teltec Ireland, Materials Ireland and Software Ireland. They provide research facilities and support services for their respective areas of biotechnology, advanced manufacturing technology, optoelectronics, electronics, telecommunications, materials technology and software development.

Five of the PATs programmes have centres in the Mid-West region. They are AMT Ireland, Materials Ireland, Power Electronics Ireland, Teltec Ireland and Software Ireland. Over thirty people are employed in these PATs in the region and an additional thirty post graduates are supported (Nolan, 1996). At the outset it is necessary to state that any findings are based not only on current literature relating to the PATs but also on interviews undertaken with two of the five PATs that are represented in the Mid-West region and which are based in the University of Limerick. Those interviewed were AMT Ireland's research centre at the University of Limerick which specialises in electronics manufacturing, providing manufacturing and technology consultancy services to industry, and Materials Ireland's research centre at the university, which provides consultancy and advice on all aspects of materials technology.

Numerous external reviews of the PATs have been conducted (STIAC, 1995, IRSA, 1996, etc.) with the general conclusion that the PATs have been successful in meeting their objectives of transferring technology to industry and in providing valuable expertise in selected niche areas. The Tierney Report (STIAC, 1995), however, noted the limited impact which the PATs were having on indigenous firms.

In AMT Ireland the participation rate of MNC's and indigenous firms is 60/40 respectively while income generated is 80/20 respectively. The PATs are experiencing pressure from the central level to become increasingly commercial and state funding is being cut back each year. However, improving commercialisation is not compatible with helping small indigenous firms. Despite this, both AMT Ireland and Materials Ireland are actively working with small firms.

AMT Ireland helps small firms by providing training in the Competitive Manufacturing Programme. It is 50 per cent grant aided and consists of a six day training programme. AMT Ireland also takes on an intermediary role between small firms and EU programmes. Materials Ireland has made effective use of the Applied Research Grant Scheme thus enabling small firms to work with them. The grant supports collaborative applied research between industry and universities which has direct industrial and commercial application. Under this grant 75 per cent of college costs are covered by Forbairt. The PATs have been relatively active in this scheme, but their eligibility will now come under review by the National Research Support Fund Board, due to the imminent change of status of the PATs into a subsidiary company of Forbairt.

The PATs have a national focus making their impact on a specific region harder to quantify. At the minimum they train graduates for industry and by benefiting firms in the region economically, they add to the overall generation of wealth. The PATs are linked to the region though, through the University of Limerick which has a very strong regional focus. The PATs represent a movement away from the provision of technical services to a more university based source of expertise. It must be asked, however, whether this approach fully meets the needs of firms in the country and whether an academic base provides the most beneficial results. Furthermore, the regional focus may be damaged through the increased importance placed on commercial viability with the ensuing conflict between academic criteria and technology transfer.

Without a formal board structure at regional level, partnership and networking occurs on a more informal level. Each PAT has a local Director from its host university and he/she acts as a link to many external contacts.

In general, the more commercial the PAT is, the less time it is prepared to spend on basic research. This was evident from comparing the self-sufficiency rates of Materials Ireland and AMT Ireland with their level of basic research. AMT Ireland in the Mid-West at 80 per cent self-sufficiency does not engage in any basic research. Apart from BioResearch Ireland which has maintained a strong commitment to basic research the IRSA (1996) noted that the other PATs are more tightly constrained as to the type of work that they can carry out. The IRSA report continued (P.3);

Without encouraging fundamental work in their PAT area, they run the risk of becoming expensive programmes in current (and perhaps not so current) technologies.

The PATs are well distributed around the country and the benefits, likewise, are spread to their nationwide client base. Due to the strong commercial outlook of AMT Ireland it does not limit its customer base to within the country and has clients in the UK. The IRSA review (1996) of the PATs recommended that their remit be broadened so that researchers working in other colleges in a particular PAT area could be included. It continued, however, that the general 'exclusivity' of the PATs would have to be overcome first. One is given the impression that researchers outside the larger established universities are being excluded from participating in an elite setting.

Access to information relating to this national programme from one central source is not available and Materials Ireland in the Mid-West is involved in marketing efforts to ensure that firms actually know of its existence. In line with the findings of the Tierney Report there appears to be a failure to promote the PATs in an effective manner.

Also, the resources allocated to the programme begs the question of whether the amount of public funding is justified and if these funds could be better spent supporting

other programmes which might cater more effectively for the technological needs of firms in the region.

In reality, the PATS is a national programme situated on the campuses of various universities around the country, including UL, and holds no specific regional remit. It forms an element of science and technology policy, which by its nature, takes place independently of, although contributing to, local development. However, while the PATS Programme is more integrated into the National System of Innovation, it contributes to its locality, namely the Mid-West Region, by enhancing its profile as a technologically advancing region which is in touch with, and contributing to the latest innovations. The PATs thus undoubtedly add to the technological attractiveness of the region and, while without regional preference, are providing valuable information to firms that are located in the Mid-West.

Finally, the PATs are currently undergoing a major structural adjustment due to their designation as a company and their future role remains to be seen.

The Techstart Programme

Techstart matches up recent technical graduates with indigenous firms which have limited technical capability and subsidises their employment within the firm for a year. This one year placement provides the graduate with valuable work experience in industry and enables the firm to benefit from his/her knowledge. The Techstart Programme originated in the SFADCo/IIRS Technical Graduates for Industry Award Scheme 1978-1982 and the Young Scientists and Technologists Employment Programme which ran during the years 1983 and 1984. The Limerick Consultative Committee of the IIRS was responsible for the initiation of the concept.

In 1986 the programme, which had been piloted in the Mid-West Region became national under the new title, Scientists and Technologists Employment Programme (STEP). In 1988 the STEP programme was renamed the Techstart programme and its title and objectives have remained unchanged for the last eight years. Administration

of the programme became the responsibility of the then national science and technology body EOLAS and was later incorporated in Forbairt. Unlike the initial years of its development there are, at present, no formal regional board structures in place.

In the past the scheme concentrated on those holding graduate qualifications, both degree and diploma holders, but this is now to be extended to those with post-graduate qualifications. Following the announcement of an allocation of an additional £4m to science and technology programmes in March 1996, the Techstart Programme received an additional £700,000. This extra funding was provided by the government to increase graduate placements from 215 to 300 in 1996. The total allocation for 1996 was £2.5m and this figure also includes funds for the Techman Programme which places a technology manager into a firm for three years in order to improve its overall performance. The graduates are placed in a firm on a one year contract basis and at present Forbairt pays the company a subsidy of £5,000 for a degree holder and £4,500 for a diploma holder, a sum which must be at least matched by the company.

The objectives of the Techstart Programme from its inception were to provide graduates with non-routine technical employment for one year and to help firms raise their technical capability through the knowledge and skills of the graduates employed. In the Mid-West region it is considered that the Techstart Programme has been meeting its aim of helping companies make better use of technology.

46 Techstart graduates were placed in the region in 1996 and 50 are expected to be placed in 1997. The Techstart Programme in the Mid-West region has, on average, 40-50 companies requesting graduates each year and this is testament to the success of the programme. The 77 per cent retention rate of graduates after the twelve months also illustrates this point. In fact, a further 12 per cent of placement graduates will have been offered a contract but will have moved on. Therefore, in reality, only 11 per cent of placement graduates are not offered further employment at the end of the year.

Approximately 50 per cent of placement companies in the region constitute repeat business. The programme though does not support firms that dispense with the

graduate after the twelve months and then attempt to employ another simply to benefit from the grant aid available.

Economically, the direct cost per job to the state is a maximum of £7,000, a £5,000 subsidy and £2,000 for possible technological needs of the graduate during his/her placement. 75 per cent of this is recouped from the EU and thus, in reality, it costs the state £1,750 to employ a graduate in the Techstart Programme for a year. It is difficult to quantify the economic effects of the programme in the region and such statistical analysis has not been undertaken to date. However, within the last eight years four of the Techstart graduates have set up their own companies.

In social terms, the programme is providing employment for 40-50 graduates in the region each year. However, it is again difficult to quantify how much of this employment can be attributed solely to the programme as the placement firms may have recruited a graduate even if the funding were not available. There is no doubt though, that Techstart encourages more firms to employ a technical graduate.

Although the number of Techstart placements has been increased, the pool of eligible placement firms has been restricted since January 1994 when small MNC's were excluded from the programme. The employers are now predominately small companies which may have for instance as few as six employees as compared to a small MNC which may have had up to 80 employees. The small Irish firms in turn require more help and attention to fully investigate their needs and the role which the graduate may play. This indicates that the process may become more time consuming and although the Techstart Programme in the Mid-West has increased from an original eight to a possible fifty placements there has not been a corresponding increase in the administrative personnel to service the programme.

The additional £700,000 allocated in 1996 was sufficient to cover the increased number of Techstart placements. However, consideration was not given as to whether there was a need to increase the level of subsidised funding given to the placement firm. The £5,000 subsidy level has remained the same since the inception of the Techstart

Programme. This figure no longer represents 50 per cent of today's average salary for a graduate which has risen to around the £12-13 thousand mark.

Similar to the PATs, while there are no formal structures or structured partnerships for the programme in the region a good informal system of networking is in place. Techstart clients are quite diverse as the programme will deal with any indigenous manufacturing company with a technical orientation, and the programme is well distributed throughout the region.

In summary, the recent increase in graduate placements from 215 to 300 is welcomed but requires the necessary support personnel to ensure its continued effectiveness. The continual monitoring of the programme and of the graduates in the region does not appear to be occurring and may be possibly due to personnel time constraints. Small MNC's with a low level of technological expertise have been supported by the programme in the past and many would benefit from future participation. Finally, it is necessary to note that the programme receives 75 per cent of its funding from the EU and as such, this programme like the PATs has no guarantee that the state will continue its level of funding in the event of a fall in the corresponding funding from the EU.

6.1.2 Findings on State Industrial Support Programmes

Measure 1 of the Research and Development Sub-Programme which funds R&D in all branches of industry, the Techstart Programme, the National Technology Audit Programme (see Appendix C), also piloted in the Mid-West region, and the Employment Grant Programmes of FÁS and Shannon Development represent the most commonly used industrial support programmes in the region. In general the satisfaction level with the industrial support programmes was high but they were also regarded as slow and bureaucratic and the need to open the Techstart Programme to small MNC's was reiterated.

In the light of such favourable findings attention will now turn to the agencies themselves and their effectiveness in the region.

6.2 THE MID-WEST ADMINISTRATIVE SYSTEM

Figure 6.2 illustrates the plethora of agencies in the region which have input into industrial development issues. In addition to these, the local Chambers of Commerce, the Mid-West office of IBEC and various local community and voluntary groups have broad interests in the topic of industrial development. This section will take a closer look at the roles of Shannon Development, FÁS, the banks and the Local Authority in the Mid-West Region.

Shannon Development

Shannon Development employs in the region of 200 people and the annual budget is made up of £11m in operating spend, £20m in grant payments, £7m in additional turnover and £3m in capital expenditure. Share (1992), describes how people see Shannon Development as the creator of jobs rather than the supporter of local initiative. He continues (P.22);

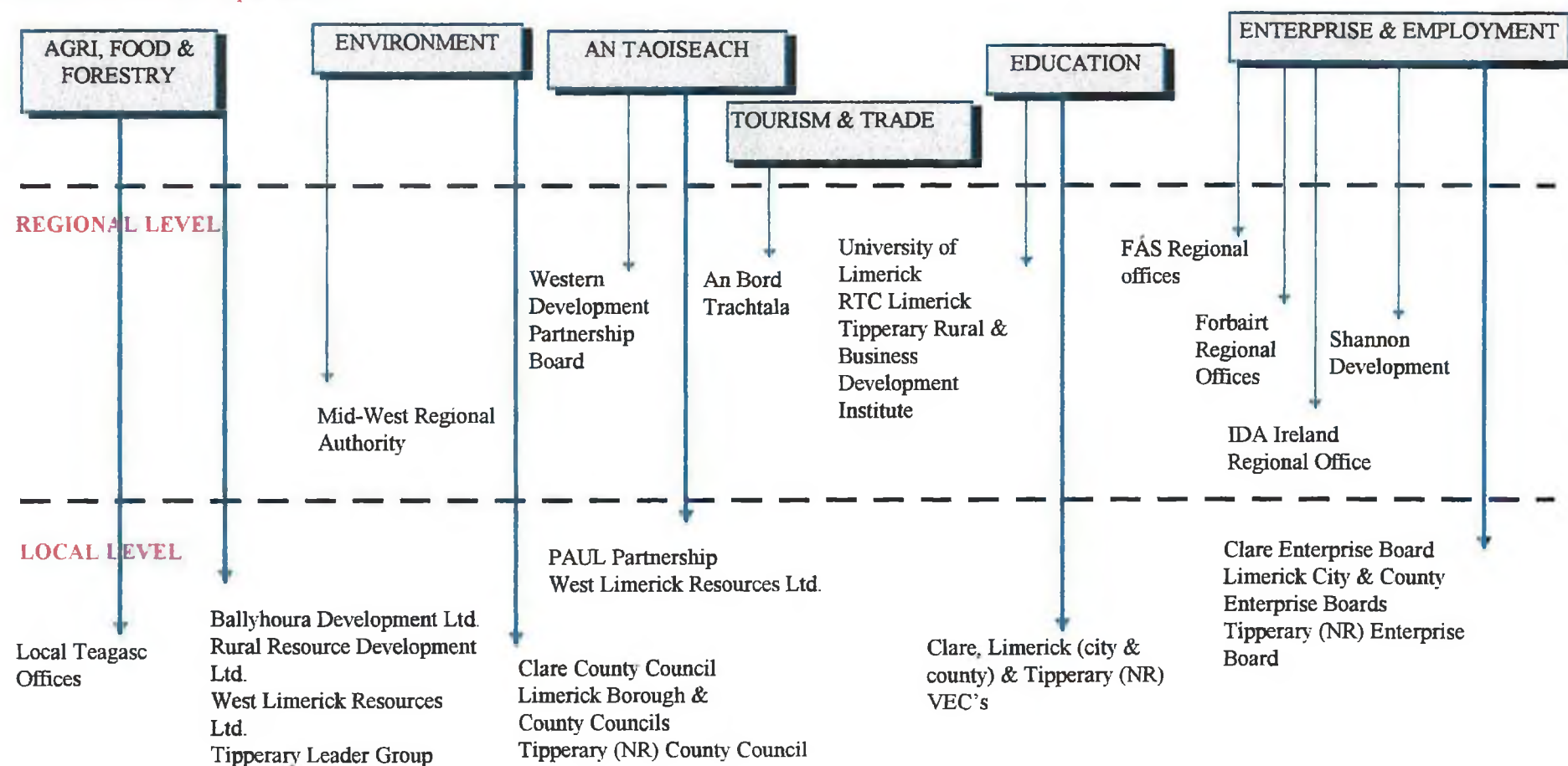
The Shannon Development company is a functioning example of an unelected top-tier administrative entity and as such is bottled onto the psychological landscape instead of growing from it.

Shannon Development is unaccountable locally and over the years has engaged in large, albeit innovative, projects largely within the confines of the Shannon, Ennis, Limerick 'Triangle'. Thus, while in theory it is a regional development agency, parts of West Clare and North Tipperary feel left out of such development. Shannon Development is now virtually 80 per cent self-financing and resultant management streamlining has moved local members to regional level within the organisation. Creativity which was often found at lower levels of the organisation has thus been lost.

Criticisms revolve around the failure of the organisation to develop the potential of the Shannon Estuary and Lough Derg and in their lack of proposals for the reduction of unemployment in the region. While, in one sense, Shannon Development has proved successful through the undertaking of projects such as the Shannon Free Zone and the

Figure 6.2 The Mid-West Framework for Economic and Industrial Development

CENTRAL LEVEL: Departments of



National Technological Park, the organisation has failed to spread this development throughout the region and at each level of society . The review of the Mid-West from a business perspective (IBEC, 1996) calls for greater accountability and cost effectiveness from Shannon Development.

Proposals for a form of Shannon Development in other regions can be qualified by a comment from Paul Quigley (Share, 1992, P.14), where he said;

Some people look on Shannon Development as a model of a regional development organisation that could, if successful, be applied elsewhere. I don't think that is a fair way to look at it. It is a state agency that happens to be located here. There's no regional representation as such on the board, there's no local democracy. I don't think there should be. If I were arguing for the existence of a thing like Shannon Development in the country I wouldn't see the main benefit as arising from its regionalisation.

On this issue of accountability by Shannon Development strong consensus exists in the region to maintain its economic powers but to have the board elected locally. Shannon Development has proved successful in using the bulk of its money on major projects. The view of those interviewed in the region is that they are not content with this role and that a whole re-definition of the development role of Shannon Development is required.

FÁS

Total FÁS expenditure in the Mid-West region in 1996 came to £40m. At the end of 1996 approximately 12,000 people had completed or were still participating in FÁS training and employment programmes. Of these, 38 per cent completed, or were engaged in training programmes and 62 per cent participated in employment programmes. There were 600 apprentices in various phases of the new apprenticeship system and Training Support Scheme grants of £485,000 was paid to 160 companies for specialist training where the training content was dictated by the employers and not by FÁS (FÁS, 1996).

As noted earlier, a large variation existed among firms in respect to the level of satisfaction with FÁS supports. Those availing of the training grants and those dictating the training content of FÁS programmes for their employees were satisfied with the service. The problem lay with firms hiring a FÁS worker trained on general purpose machinery who was unable to fit the specialised needs of the firm. In this situation dissatisfaction is strongly evident as was noted in the IBEC report (1996) which reported on a survey in which only 27 per cent of respondents were recorded as being happy with the service provided by FÁS. This is, however, largely a national problem due to tightly controlled central budgets which dictate the amount which can be actually spent on training services. The result is that over 90 per cent of the FÁS budget goes on activities that can be placed under unemployment support (IBEC, 1996).

IBEC (1996) has called for the establishment of a management body composed mainly of employers which would interface with the deliverers of training. However, if the State is not prepared to increase spending on training and if the employers are not prepared to contribute both financially and vocally towards present and future training needs then such a body would hold little potential.

Under the new apprenticeship system the number of places available has been reportedly doubled. The old and new apprenticeship systems are in a phase of transition and it is too early to tell whether the new system will both improve the standard and raise the number of apprentices in the Mid-West. Ultimately its success will depend on the necessary support from the public and private sectors.

The Banks

Similarly to FÁS, a large variation existed among firms in regard to their level of satisfaction with the service provided by the banks. Each personal experience is different but so too is the bank representative approached and his/her feeling about a particular project. Indeed firms have found very favourable reactions from some and a

total rejection from others. In general most firms were satisfied with private sector financial support but were dissatisfied with the collateral required by banks.

The main criticisms against banks concern the high degree of central control, the lack of high risk finance and their general unwillingness to take risks. Without doubt more centrally controlled criteria have been brought into the banking process. However, on the one hand, it can be said that greater efficiency at local level was needed, while on the other, it is acknowledged that the local banker does have a degree of discretion although this does depend greatly on the individual and his/her knowledge of the business area and even of the person. It is in these areas that the local bank often falters and a greater knowledge of their business community is required.

From the perspective of the banks all blame can not be attributed to them as some firms wish the bank to virtually run their business for them. The point was made that firms will often get their accountant to draw up a business plan purely for the purpose of getting a loan with little understanding of it themselves. A business plan is first and foremost a plan for the manager on how the firm will be run. However, it appears that a large body of business people are still not financially minded, a situation which must represent a failure in the training and support system. It is evident that technical, financial, marketing and managerial skills must be in place to run a business today. Strict adherence to a business plan can often cause more problems than it set out to avoid. Therefore, the development of loose conceptual plans adds flexibility and freedom to meet and deal with future opportunities or obstacles. However, this approach is dependent on the individual's tacit knowledge of the business and his or her ability to change. Thus it is the ability of the entrepreneur and the banker to understand the industry and the market trends both nationally and internationally that will ensure a successful outcome for both.

The banks are currently attempting to get more involved in their community, getting out and meeting their customers more. They have been supportive of local business and development initiatives in the region, for example, through the sponsorship of the Limerick County Enterprise Board's Enterprise Week, but ideas that involve a degree

of risk, especially those coming from the long-term unemployed, continue to be turned away.

Irish banks are simply not in the business of risk-taking and firms need better access to start-up and venture capital from other sources or more companies like Iona Technologies, an internationally successful computer software development company, will have to continue to go abroad to get the necessary finance.

Local Government

The weakness in the local government system lies in its lack of financial independence. While the proposals of the Devolution Commission and the recently published 'Blue Book' are a step towards the application of the principle of subsidiarity, local government itself in the region remains pessimistic of the outcome, expecting to be given responsibility for more services without the necessary additional funding. The belief exists that central government does not want to and will not devolve more power to local levels, thus stifling any innovativeness that may exist there. Similar to the situation in other European countries a proper system of financing administered locally is required.

The proposed bringing of local development groups within the local authority structure after the year 2,000 produces two contrasting views from the County Enterprise and Partnership Boards. In general the County Enterprise Boards (CEB's) have no objection to this move provided that they will operate autonomously, although reporting to the local authority. In contrast the Partnership Boards believe that they will wither within a local authority structure, a belief reiterated by other agencies in the region. Irish local authorities are not known for their role in local economic development and a whole re-education of local government is required if they are to undertake responsibility for these boards. Local government is regarded as having little empathy for the disadvantaged communities which the Partnership Boards work with. Indeed a wide public indifference to local government has been identified and is a contributory factor to the absence of civic leadership at local level in the country

(Boylan, 1996). This indifference has arisen out of a lack of trust in local politics, with people looking more to central government to solve their problems. Clientelism prevails and the development of these new community self-help groups represents a first step in the development of a civic pride and culture. Community representatives are often uncomfortable on Partnership Boards, some contributing little to the community group which they may have originally helped establish, but which now has a high representation of public bodies. The fear is that within a local government setting they may be lost from an initiative that had been primarily about self-help, a process not associated with the local authority system.

With regard to the creation of the Regional Authorities, the Mid-West Regional Authority was predominately described as a 'talking shop' which was ineffective due to the size of the board. The Authority comprises 26 members from the region's administrative councils and it is assisted by two committees, namely the Operational Committee which has 22 members and the EU Operational Committee which has 43 members. There is little enthusiasm for or interest in this new body, a situation which does not augur well for any new initiative. It begs the question as to whether the Mid-West actors do not realise the potential of this new level of administration or indeed if this level is actually necessary, given that co-operation does and can occur without this additional layer.

Contrasting calls for the rationalisation of local authorities and the creation of regional governments and the need for a system of local government at sub-county level have been aired. The delivery of services to the people at the lowest possible local level without the addition of a further costly administrative tier is however the central issue in effective local government. The local authorities in the Mid-West region are currently looking at how more services could be provided at the local level, thus reducing service needs at the county level.

It is essential that such a process also happens from central level down to both regional and county levels as the regional tier will only gain respect and status through the real devolution of powers. Conversely, local government must demonstrate its ability and

its willingness to take responsibility for local economic and social development by becoming more responsive to local needs and to be active supporters of local initiatives.

6.3 SUPPORT FOR FIRMS IN THE MID-WEST

The level of satisfaction with the overall support structure was rated as good by the firms interviewed in the region. The disjointed nature of support was the prime complaint. Similarly, the industrial development agencies in the region rated the support structure as good, although they remarked that the structure is not effective at growing large businesses. However, concern about the absence of large businesses should not take precedence over the need for a dynamic small firm population. It is from this base, even if some grow large, that sustainable industrial development is achieved. Support for the short-term unemployed wishing to set up a business was also identified as lacking in the region.

On starting a business, Shannon Development came out strongly as the most significant source of help. However, if the firm had undergone any significant product or process development since its inception the top three most significant sources of help were as follows; the University of Limerick (both in terms of graduates and the R&D function), Measure 1 funding and Shannon Development. On starting a business, Shannon Development, FÁS and the banks were the most frequently used agencies, while during the on-going development of the business, Shannon Development, Forbairt and FÁS represented those most frequently used. The level of service provided by Shannon Development and Forbairt to firms was regarded as good while the level of service provided by the banks and FÁS, as noted earlier, varied considerably from poor to very good.

50 per cent of the firms interviewed in the region do not relate the performance of the firm to its location in the Mid-West. Those that do, attributed it to the quality of graduates in the region. On relating the support structure to the performance of the firm again only half believed that it could be attributed to the support structure. In these cases Forbairt and the Innovation Centre were mentioned. The majority of firms

interviewed believe that they could have set up in another region and have achieved the same level of performance.

This response was in direct contrast to the belief of many agencies in the region that the support structure is better than anywhere else in the country. Though employment in Irish-owned companies in the Mid-West has increased by 12.4 per cent over the period 1990-1995 compared to a national average of 2.8 per cent, this may be attributed more to an increase in the sub-supply sector and the growth in international services than to the support structure that is in place. This is not a reflection on the good work carried out by agencies, but more a caution against the over-estimation of their role. Agencies' perceptions of firms' needs and the development of programmes to meet these needs may not always match the actual needs of firms. A division between firms and development agencies clearly prevails.

6.3.1 Overlapping

An independent appraisal report on the co-ordination of local development for the Limerick City and County Strategy Group (1996) found high levels of co-ordination among the member organisations and associated organisations with few overlaps in service provision. A need for greater co-ordination in the area of business development, training and mentoring was however identified. For instance, the Strategy Group identified a possible duplication between the Small Business Development Centre administered by Shannon Development and the Business Information Service which is being established by the Limerick City Enterprise Board. Both aim to provide a single point of contact for entrepreneurs and the Report recommends that the harmonisation of these two services should be considered.

This is simply one example of overlapping and duplication which is prevalent in the region. More important is the situation whereby firms are able to 'shop around' for grants from the various agencies illustrating not only duplication of services but the duplication of administrative costs.

Interviews with key actors revealed that there is total consensus in the region that overlapping and confusion does exist and the above mentioned Strategy Group has produced a leaflet listing the help which is available from the different development bodies and the criteria used to assess projects submitted. Surprisingly firms in the region were not concerned about this confusion, simply believing that if they phoned the wrong agency first time then the second call would be successful. The firms are in fact more concerned about the administrative costs needed to support the various agencies and their many programmes.

In addition to calls for better co-ordination, the rationalisation of the number and size of agencies in the Mid-West has also been voiced. The IBEC Report (1996, P.38) noted;

The plethora of agencies with associated additional bureaucracy and overhead costs makes little economic sense and does not support the development of an integrated approach to industrial development, particularly at a regional level.

However, initiatives are often achieved faster through small ad-hoc groups and it is thus possible that the benefits of a plethora of agencies outweighs the negatives incurred through the duplication of some services. There is no doubting the positive input the Partnership Boards and the Leader Programmes have had on their respective communities in stimulating activity and uplifting spirits. This role had previously been largely untouched by public bodies.

To a large extent each agency in the region has its own distinct role offering specialist services to a particular market segment. The integration of all these services at the point of delivery to the firms is where the real need arises to overcome present confusion. In the event of County Council services being decentralised to more local levels, it would seem practical that the local government representative could act as the local development officer. Delivery of this service would also serve to integrate local government more fully into the local community.

An external review of all agencies in the region is required to identify duplication and rationalisation needs, in order to ensure the efficient use of funds. Rationalisation

needs should focus equally on the number and size of the agencies, to eliminate any unnecessary use as well as duplication of administrative funds. Finally, “the need for improved complementarity of development activities across the region” (Fitzpatrick, 1997, P.77), and the resultant overlapping highlights the weak culture of co-operation and the lack of formal co-operation mechanisms at a county and regional level.

6.4 VOCATIONAL EDUCATION AND THE THIRD LEVEL SECTOR

Vocational Education Committees were established following the Vocational Education Act of 1930 and have responsibility for approximately 32 per cent of second level schools in the country (Government of Ireland, 1996). In line with the national figure, approximately 34 per cent of second level schools in the Mid-West region are classified as vocational.

In the 1930’s vocational education was specifically focused on the acquisition of particular skills required to help an emerging nation, for example, woodwork and metalwork. The national culture was, and largely remains, pro-academic and the established education sector found it difficult to accept the importance of such practical skills. The service remained quite traditional until the 1960’s when provision was expanded and modernised. In fact, over the last twenty to thirty years the distinction between vocational schools and other secondary schools have blurred as the vocational schools have taken on a more academic approach and the secondary schools have started teaching vocational subjects. Today, it is unsure whether vocational education can be clearly defined as all types of schools in Ireland (vocational, secondary, comprehensive and community) appear to be moving towards the same standard educational model.

Therefore, rather than developing a distinct vocational education system an equal recognition and respect for both the technical and academic subjects in school may be the way forward. Many traditional secondary schools remain unappreciative of the value of technical subjects which are regarded as being primarily for the weaker students. A whole cultural change in attitudes has tentatively begun, as seen through

the adoption of vocational subjects by secondary schools, but a stage needs to be reached where technical subjects are taken by the brightest students as well as the weakest. There is a need in Ireland to recognise that intelligence is manifested in a variety of ways, through both the design of a table to the writing of prose. These vocational/technical skills can then transcend to the development of high class technical graduates and post graduates.

Changes which have occurred within the VEC sector include the handing over in the mid 1960's of apprenticeship and industrial training to AnCo, the industrial training authority which was subsequently amalgamated with the Youth Employment Agency to form FÁS, and the establishment of the Regional Technical Colleges (RTC's), established under the auspices of the VEC's in 1970, as autonomous institutes. As well as developing strong links with local industry the RTC's technical facilities provided a quality adult education sector at night. Night classes had been an integral part of the VEC service from its inception. Adult education organisers were appointed to almost every VEC area in 1979 and in recent years new services have been developed for low literate adults, travellers, women's groups, early school leavers and the unemployed. Youthreach is the current programme directed at early school leavers and the Vocational Training Opportunities Scheme (VTOS) permits the long-term unemployed return to full time education without losing their social welfare benefits.

Thus, while the distinct role of the vocational education sector has become blurred, the VEC has acted as the 'local delivery mechanism' for adult education and remains at the 'forefront' of many local development initiatives (Conlan, 1995). Indeed, at a time when there is the possibility that the VEC's will be replaced by, or amalgamated into regional education authorities, the role that they have carved in the area of adult education represents the strongest justification for their continuation. At the annual conference of the Irish Vocational Education Association in June, 1997, its president called for the VEC's to be given the job of organising a network of pre-school education throughout the country (Pollak, 1997). He also criticised the negativity of the Department of Education towards vocational education and it is clear that although vocational schools may no longer exist in reality the promotion of vocational subjects

remains as important as ever. Therefore, the VEC's continuing involvement in vocational education, albeit possibly within a regional structure, is crucial for the technical development of the country.

The Mid-West region is home to the University of Limerick (UL) and the RTC Limerick which both have a strong orientation towards business and technology. The University of Limerick has 6,000 students and the RTC Limerick 2,800. In 1992 34 per cent of primary degree and 46 per cent of higher degree graduates found employment in the Mid-West region (IBEC, 1996). In addition, the Tipperary Rural and Business Development Institute, an initiative of the Tipperary VEC's, is due to offer its first courses in September 1998.

Both UL and the RTC have strong links within the region and are involved in co-operative projects such as the SRIS and SHIPP (Shannon Information Society). While UL is highly involved in international R&D projects the RTC is just starting to develop R&D in the college. The establishment of the Entrepreneurs Programme in UL in 1984 created a strong link between the university and firms and through the Business Consulting module students can undertake feasibility studies for firms. It is estimated that over the last decade the students have assisted over 400 firms in the region. Quinlan (1995), however, found that the rate of co-operation between the higher education sector and firms in the counties of Limerick and Clare was only 16 per cent, a rate below the national average. This finding was compiled from unpublished EOLAS data which asked 671 firms around the country whether they were a member of a R&D consortium that was involved in co-operative research with the higher education sector in Ireland. While this can be partly attributed to the relatively large number of firms in those counties having formal R&D departments, it does appear that industry is not sufficiently aware of university capabilities. Universities are not effective enough in promoting their research capabilities to firms, a problem which was earlier identified in relation to the PATs located on the UL campus.

Third level institutes in the region are remaining in touch with industry needs through the establishment of new courses. For example, a new degree in equine science has

been established within UL to cater for the bloodstock industry. However, industry is not always effective at projecting and stating its needs, a problem also identified by FÁS. Industry needs to become more pro-active by clearly stating future needs and by becoming more involved in the promotion of relevant courses. Course promotion can be achieved by showing secondary school students the type of careers that would result from undertaking particular courses. This will benefit both the student, unsure of what career to choose and the employer, who will have a larger pool of graduates from which to choose.

The third level sector also identified the need for more informal settings where an exchange of information on initiatives happening in the region could take place.

The potential of technology parks and innovation centres is often overestimated with a resultant gap between the aspiration and the reality on the ground. However, they are regarded as an important element of national systems and the National Technological Park in Limerick has helped address the important role of science and technology in industrial development.

While the innovation centre in the National Technological Park has provided a valuable base for many firms, Quinlan (1995, P.48) comments how innovation centres “have only had a limited impact in increasing opportunities for graduates outside of the Dublin area”.

Of interest here however, is the study entitled ‘Connectivity and Community’ (Bannon & Byrne, 1997), which was commissioned by the National Technological Park to enhance information linkages among relevant actors on the Park, in a longer term context of encouraging innovation through formal and informal communications mechanisms. Findings included that the relationship between the Park concept and the university needed to be clarified, that the notion of a Park community needed to be encouraged and that greater consistency between the information dissemination activities of the UL Newsletter and the Park Bulletin was needed.

As well as improving formal contacts, a minimal social calendar for companies on the Park has been established, for example a Christmas reception, an Easter reception, etc., to develop this notion of a Park community. The study was undertaken within a small area but the findings and more importantly the recommendations of the report could be used to address similar problems found on a county or regional scale. For example the Mid-West region needs to clarify the relationship between, and the distinct roles of, the agencies in the region, given that the community spirit is weak and formal and informal fora which would join the relevant industrial bodies together at both local and regional level are lacking.

6.5 LINKAGES AND THE SOCIAL STRUCTURE

The industrial development agencies in the region are well linked formally through cross-representation on each others boards, on strategy groups and through the new regional initiatives of the Regional Authorities and the SRIS. However, no formal structure for joint meetings on industrial policy exists between these various agencies in order to co-ordinate their efforts. At a county level Tipperary (NR) CEB (1997) does not believe that the County Strategy Groups are meeting this need due to the limited number of participating agencies² and intends to set up a working party of all relevant agencies within the county.

The weak state of formal co-operative mechanisms on a county level is accentuated further at a regional level. Due to its size and variety of interests the Regional Authority does not represent a forum at which the joint formulation and co-ordination of industrial policies on a regional level can take place. The SRIS is yet in its infancy and it is too early to tell whether the working group formed will continue after the EU completion date. It does however, represent a real move towards a closer working of the public, private and education sectors at a regional level.

² County Strategy Groups comprise the Local Authority, Partnership Boards, County/City Enterprise Boards, Leader Programmes and the County Tourism Committee.

Having a wide body of representatives on a board does not automatically ensure positive contribution or even interest from all of its members. So much depends on the informal linkages which already exist and the predisposition to achieve something together. In fact, the region has a good network of informal linkages between key individuals and it is these inter-personal relationships, not the agency-to-agency relationships which have led to successful development in the region. This informal structure appears to have been strengthened as a result of the abolition of the Regional Development Organisations in 1986. That is, more direct relationships were formed due to the lack of a regional forum. The strength of informal linkages however is counterbalanced by an intrinsic major weakness namely, the transience of the individual either through promotion in an agency or migration, breaking ties formed over time.

Internal changes in Shannon Development have resulted in many informal links being broken. These informal links, as mentioned, have developed between key individuals in industrial development agencies and, today to a large extent, take place between chief executives seldom working down to the middle management. Also, the extent to which such inter-relationships take place between the industrial representatives and the actual community is questionable. Consensus must be reached not only between industrial policy makers but between the policy makers and the community. Often it is forgotten that policies are made to suit the community and the 'Strategic Management Initiative', a multi-faceted programme for the reform and renewal of the public service, was described more as a 'paper exercise' than a real attempt by the local authorities in the region to improve accountability and transparency.

Although the strength of the informal structure is the basis on which development can occur, it must not become over dependent on key individuals. A strong informal structure needs to be complemented by a strong and committed formal structure at both local and regional level.

A substantial degree of interaction is currently taking place between industrial development agencies in the region. These have ranged from joint seminars on EU

information to the joint initiative of getting Plato located in the region. However, more interaction and co-operation is required, especially on a regional basis. The culture of co-operation remains weak in the region and will not improve until the mentality of secrecy and protection of one's own territory disappears.

Although networking and co-operation are recognised as important in the region it is also recognised that the more consultation that takes place, the slower the whole process becomes and many agencies are becoming frustrated by what they see as time wasted. However, if consensus is the desired aim then time must be spent discussing any idea, not only with other public sector bodies, but with the community in which the policy or programme may be implemented. Joint meetings and working groups at the outset need to set tangible goals and targets, they must be efficient in size, time and length of meetings and most importantly include private sector representatives and public members who have interests in the area. Joint meetings must be undertaken in both formal and informal settings to build stronger commitment to the process in hand.

6.6 CULTURAL AFFILIATION

The background to innovation and current innovative projects being undertaken in the region has been referred to in previous sections. Attention will turn here to the location of innovation in the region and the distinctive features, if any, which sets the Mid-West apart compared to other regions in the country. The section will also discuss any problems that can be associated with centralised control and the existing commitment in the region to integrated development.

The University of Limerick, the National Technological Park and the Innovation Centre located within it are regarded as the prime sources of innovation in the region. Shannon Development is also acknowledged as an instigator of innovative projects. While innovation is primarily associated with the 'high-tech' activities of the University of Limerick and the National Technological Park caution must be exercised in evaluating its real value to economic and social development in the region. High-tech R&D resulting in spin-off companies and improved technological capabilities relate

only to a particular stratum of industry and consequently, of the community in which it is embedded.

This innovativeness, is thus of little use to the long-term unemployed who also have innovative ideas for new businesses. It was this void that the Partnership Boards and the County Enterprise Boards were intended to fill. An OECD Report (1996) strongly praised the innovativeness of the organisation and structure of the Partnership Boards. However, it is the stimulation of innovation within local communities and not the innovativeness of the Board itself which is ultimately the crucial factor, an innovativeness which appears to be lacking at this level in the region. Local proposals often solely address social issues without consideration of the possibility for the future commercial success of the project. Though community activity is growing new firm proposals received by the Boards in the region often lack imagination and are similar to other projects received. Thus while community activity is strengthening, it is driven by individuals from the public agencies.

Innovation appears to be occurring in an ad-hoc manner within small groups at all levels. Education institutes and 'high-tech' firms are often representative of innovation in an area, to the exclusion of a new traditionally based firm that has found a niche market. Historically the Mid-West is known for its innovative individuals, and while they can be found today, a whole new understanding of the innovation process is required, to show that the agencies are there to stimulate innovation throughout the whole region and at all levels. Agencies therefore must remain innovative to cater for the changing needs of the population, and thus their future role in the region must be to stimulate a whole culture of innovation that transcends the notion that innovation only takes place in research institutes and 'high-tech' firms.

The existence of Shannon Development as the only autonomous regional development agency in the country represented the most distinctive feature of the region, according to those interviewed. This was followed by the University of Limerick, Shannon Airport, the RTC and the National Technological Park.

The development of the region since the 1950's is not matched elsewhere in the country. Good linkages do exist in the region, especially between Shannon Development, business firms and the higher education institutes, but it is difficult to estimate how much of this can be attributed to the good informal relationships which currently exist. Furthermore, both public and private interests in the Mid-West are proactive in seeking to achieve the goal of development of the region.

6.6.1 Localisation Vs Centralisation

Budget restrictions, rules and criteria, limited flexibility and the time consuming nature of the decision making process, were the main objections to the degree of centralised control which exists in the region. Despite these, most agencies were content with the degree of discretion which they held apart from the obvious need to strengthen local government. It was surprising that development agencies in the region felt that they held sufficient devolved power and were not striving to achieve more regionally or locally based power. This represents a manifestation of the long history of central control which has resulted in a form of cultural dependence on the core, which has stilled any local spirit of independence which may have existed.

The continuing drift of economic power to Dublin and the east has been recognised but recent work by western counties to counteract this trend has far too often rested on the development of statistics on the regional spread of IDA inward investments. Rather the West should concentrate on how they, themselves can develop their own region without depending on the core for handouts.

Commitment to partnership has improved over the last five years in the Mid-West region but as mentioned earlier a degree of secrecy and of protecting one's own territory still exists and no formal structure for the co-ordination of industrial policy at county or region level is in place.

While development bodies are involved in co-operative projects they do not appear to be communicating effectively, with a resultant lack of cohesion. Likewise the views of

the private sector are not coming across strongly enough. Though firms believe that decisions in which they have had no participation are being made in the region, they also accept blame as the opportunity to participate is open to them. There is a definite need for agencies to encourage more input from firms, but this will only be achieved if they can show that the firms are being listened to through direct action in response to their identified needs and suggestions.

The various public sector agencies in the region are not working towards the development of the region as a whole but rather development is taking place through the plans of individual agencies without the formulation of a coherent overall regional strategy. A sound implicit plan may exist in the minds of various individuals on a county level but as this is not explicit it does not form either an implicit or explicit regional plan. In terms of infrastructure, there is little missing in the region and although agencies are not working in isolation no real regional strategic thinking is in place. In fact, recent policies and programmes have become more area focused. There is little enthusiasm for the concept of regional economic planning, with county groups much happier to co-operate in a more ad-hoc manner.

If the SRIS can achieve some concrete changes and formulate proposals that are looked on favourably by all in the region, the importance and the benefits of developing strategic thinking at a regional level may be accepted. If this does not occur the regional policy layer will remain undeveloped and be regarded as a waste of time.

6.7 CONCLUSION

- The Mid-West has a strong tradition of innovation and the region is the prime location in Ireland for the piloting of national programmes and for the attraction of EU programmes and initiatives. Although MNC's are still being successfully attracted to the region, it is important that a decision is made about the future of the 10 per cent corporation tax rate, a prime attraction for inward investment nationally. The main obstacle in the development of indigenous industry is often the low level of managerial

skills that exists and the recognition by firms of their deficiencies. The creation of new training initiatives are essential for continued success.

The SRIS has the potential to promote and gain acceptance for a regional level of economic planning in the Mid-West while the Inter-Firm Co-operation Networks Programme must ensure that it does not repeat the mistakes of the Danish Network programme on which it is based. The PATs are restricted in their research due to commercial requirements and their future direction needs clarification, while, increased placement numbers in the Techstart Programme must be catered for by a corresponding increase in administrative personnel, to ensure continuous monitoring of the graduates and of the programme itself.

State industrial support programmes are regarded highly in the region despite their somewhat bureaucratic and inflexible nature. Similarly the overall regional support structure for industry is well rated by firms in the region, although the structure does not appear to be successful at growing large businesses. Firms interviewed in the region do not relate the performance of the firm to its location in the Mid-West, or to the support structure that exists. Thus, a divergence exists in what firms and agencies perceive in the Mid-West.

Although Shannon Development has been a success in parts of the region, it has failed to spread this development throughout the region and at each level of society. In spite of criticism, FÁS has proven successful through the provision of training grants and when training content has been dictated by the firms. Lastly, most firms were satisfied with private sector financial support, although dissatisfied with the security required by banks.

Local government remains pessimistic about recent steps towards the devolution of central government services expecting increased responsibility without the necessary additional funding. There is general consensus that the inclusion of the Partnership Boards within the local authority system will lead to their undermining and a whole re-education of the way local authorities think is required. The present system of

Regional Authorities is not catering for the need for a formal mechanism of co-operation on industrial matters at a regional level and the size of the board and the wide range of issues with which it deals is making it inefficient.

Linkages within the Mid-West region are occurring more on an informal basis and are much stronger on a county than on a regional level. A formal mechanism for the joint discussion and strategic planning of industrial policies needs to be developed at county and regional level to complement already existing personal contacts. While linkages exist, a culture of co-operation is not in place and there is a lack of experience of working as a group on a regional level.

A degree of overlapping and duplication exists but the solution may be more communication rather than rationalisation, as the remaining agencies will soon overlap without effective communication. To address the problem of confusion experienced by firms, a local authority representative could possibly act as a single point of contact in a particular area. The need also exists for a complete external review of all agencies in the region to ensure that they are working in the most cost effective manner possible, thus uncovering the duplication of high administrative costs.

The report commissioned by the National Technological Park provides an interesting study on informal linkages in a confined area. The use of social events to strengthen links in the Park is an initiative which could be considered on a larger scale to maintain the personal contacts which already exist in the region and to ensure that new ones are developed.

Innovation is not the sole ownership of the research department of universities and 'high-tech' firms and represents only one level on which innovation takes place. The innovativeness of the long-term unemployed starting a new enterprise must have parity of esteem with firms developing in the Innovation Centre. In the long-term they may even add more economically and socially to the development of their locality. Indeed, the importance of vocational education, adult education and other services provided by the VEC's has been identified as crucial for the continuous development of the country.

Central control is accepted, with little enthusiasm for more local control of the development of the region. A culture of innovation and enterprise throughout the region is lacking and must be promoted at an early age. Growing community activity must transcend into a strong civic culture and the importance of a formal strategic planning mechanism must be recognised, to ensure that a coherent industrial strategy that caters for all levels of society throughout the region becomes reality. Only then may a strong regional system of innovation come into force.

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CHAPTER SEVEN
EVALUATIONS AND
CONCLUSIONS

7.0 INTRODUCTION

Current industrial policy research and analysis worldwide centres around discussions about innovation policy and associated systems of innovation, networking, clustering and high-tech R&D. The mass production era has given way to the role of flexible specialisation as the model of best practice production to cater for today's needs. Knowledge is recognised as the most fundamental resource and innovation involves an on-going process of continual learning. The industrial districts and clusters of the 'Third Italy', Baden-Wurttemberg and Silicon Valley are the frequently cited examples of industrial success and, in turn, the potential of regions to create their own economic development, and the recognition of SME's as the major sources of innovation, is widely acknowledged in the literature and is reflected in public policy initiatives.

These policies have increased in stature, primarily due to the failure of the EU and the nation states to create sufficient jobs and, their inability to convert technological research into commercially competitive products. Thus, policy from the EU currently calls for a strategy rooted in international trends but built on local strengths with the catch phrase, 'think globally, act locally'. It has been accepted that too many policies are dictated from the centre and that they can, in fact, have negative effects on particular regions. These ideas have also influenced the foreign direct investment sector in that increased pressure is now being placed on exogenous firms to integrate into the locality, although undoubtedly exploitation of the host nation continues in particular circumstances.

Since the late 1980's attempts have been made to illustrate the process of innovation in a systemic national setting and more recently in a regional one. Critical elements of the process and the relationships between them have been identified (see Figures 3.1, P.57, 3.2, P.58, 4.1, P.100 and 4.2, P.102). Excluding the definition of a NSI by Mjoset which includes civil society and vocational education, the remaining models have concentrated strongly on the research and technological aspects of innovation systems. Thus, at a regional level this thesis has developed a more inclusive system incorporating

various actors and factors, and most importantly the social and cultural influences which had been largely disregarded in modelling innovation systems.

In order for the information economy to achieve its potential the importance of the tacit, the informal and the implicit as elements of the innovation process require greater recognition. A civic and technical culture are the foundations that result in the development of clusters and industrial districts and not the number of universities and research institutes that can be found in a particular region. R&D, as it has been discovered, can not be turned into commercial successes unless user competencies and local specificities exist that can use this knowledge to adapt or develop new products. A new organic production system that not only recognises the importance of people but which integrates them with the technology and the organisation is critical. It requires the integration of technical and tacit skills to develop an efficient and sustainable system.

It is therefore the contention of this thesis that the innovation process is closely linked to the cultural and institutional structures of a region. Thus not only is it a combination of many factors which will allow a region to develop indigenously but also it logically follows that different solutions are required for different regions. In other words a single policy for a whole country is not feasible and strategies must be developed and implemented at the local level.

In the light of such theory the in-depth study of Ringkjøbing County, and in particular the municipality of Herning, in Denmark and the Mid-West region in Ireland will now be evaluated under the following headings;

- the local government system,
- industry structure,
- public policy and support structures,
- financial institutions,
- vocational training and the apprenticeship system,
- third level education and R&D, and
- the particular culture of the respective regions.

These will be discussed and evaluated in order to see how closely they correspond to the model of a RSI developed in this thesis (see Figure 4.3, P.118). In essence this final chapter will present the current situation in these regions, the lessons that have been learned through comparison and finally conclusions on the direction future industrial policy in Ireland should take.

7.1 LOCAL GOVERNMENT SYSTEM

Ringkjobing county has a population of approximately 270,000 people, representing 5.2 per cent of the national population and the Mid-West region has a population of 317,000 or 8.8 per cent of the national population. Both regions are designated as NUTS 3 level. However in relation to devolved power the similarities end. The Danish county/regional level as has been described in Chapter Five holds a wide range of administrative and planning powers and functions while the Irish Regional Authorities are more like regional assemblies with no executive powers and are regarded simply as debating fora.

A comparison of local government systems in Europe (see Table 4.2, P.110) presents the total number of units at regional, county and local level, for Denmark and Ireland respectively as being 289 and 122. This substantial difference can not be explained totally by the larger Danish population size and more importantly Ireland is placed at the bottom of this European league table. While Danish local government expenditure per annum is 30 per cent of GNP, it represents a mere 5 per cent of GDP in Ireland. With Ireland holding only half of the functions held by the local government system in Denmark it clearly illustrates the unwillingness to devolve real power and functions to the local and regional tiers. Also, when the current local government reform is being regarded pessimistically by its own local authorities real devolution of powers and functions to the regional and local levels in the near future is remote.

The Danish and Irish systems of local government, in reality, come from opposite ends of the spectrum. The Danish system has a long tradition of independence at its core while conversely the Irish system is characterised by a strong dependence on the central

government. The recent attempts by the municipalities in Ringkjobing county to join together in a form of sub-region in order to develop strategic industrial plans for the area can be interestingly compared with recent discussions in Ireland to not only strengthen the county level, but also the sub-county level. The case study regions Ringkjobing county and the Mid-West region have been devised mainly for their administrative and managerial convenience. However, it is usually the municipality or county/sub-county level which represents defined communities with a shared sense of community and value system.

Therefore, before the development of an effective regional system of innovation in the Mid-West can be achieved, it may require not only the devolution of powers to regional and local levels but also the acceptance that strong local systems of innovation will be the first step in this process. The absence of a strong local government system may indeed be the reason that differences at the regional level exist, and that this must first be rectified before the other can be successfully achieved. However, devolution will not be achieved in Ireland until its people are committed towards and demand this process.

Although Denmark has very strong municipalities, their independence is hampering co-operation with each other as portrayed through the development of Herning-Ikast Industrial Park. In fact, Ireland has the opportunity to start from the beginning in respect to the design of its local government system by having services placed at the heart of a new local culture which would accept its inter-dependencies with other localities. This would avoid the development of independent feelings that could prove harmful in the long-term and that would result in a situation whereby local systems would freely move into and out of regional co-operations.

Therefore, while undoubtedly a large degree of Ringkjobing county's success can be attributed to the strength of the system of local government, a model which Ireland could learn much from, the Danish system must, in turn, become more open to new forms of regional co-operation.

7.2 INDUSTRY STRUCTURE

After the Second World War Ireland and Denmark were similar both economically and industrially. Danish industry diversified and specialised in accordance with the principles of flexible specialisation while Ireland concentrated on the attraction of MNC's which led to a workforce generally engaged in repetitive tasks with little improvements in skill levels. The prime industrial sectors in Ringkjobing county are clothing and textiles, iron and metals, foodstuffs and wood and furniture. In the Mid-West, electronics, engineering, communications, computing technologies and aviation-related services dominate the industrial base. Immediately it is apparent that Ringkjobing has maintained and developed its more traditional and natural resource based industries while in the Mid-West the food and clothing industries have become virtually second class sectors in contrast to the investment in the newer 'high-tech' industries. The under-investment that exists in the traditional industries in Ireland has ensured that the integration of new technologies has not occurred and dependence on the 'high-tech' industries has increased.

There are approximately 700 indigenous companies and 140 overseas companies in the Mid-West region in Ireland. In Denmark's Herning municipality alone, there are approximately 720 companies with more than five employees and 32 of these have more than 100 employees. These figures are very telling showing the high clustering of firms in Herning with a population of 57,000, approximately one fifth that of the Mid-West region. While it has been identified that the failure rate of firms, especially indigenous, is high in the Mid-West maybe more importantly it can be deduced that a slow start up rate exists, indicating a low level of entrepreneurship compared to the region in Denmark and reflecting Ireland's weak enterprise culture.

The prime characteristics of firms in Ringkjobing county are, that they are loyal and close to the customer, that they are resilient and adaptable, flexible with a high degree of quality and that they are involved in tight social networks that have developed over time based on reputation and trust. Many of these firms are also reluctant to engage external specialists and consequently can be disadvantaged by this independence. The prime

characteristics of indigenous firms in the Mid-West of Ireland would include their lower level of productivity and R&D as compared to their foreign counterparts, poorer quality and standards and a lack of skilled personnel. However, the skill level has begun to rise and indigenous firms are beginning to meet international standards, although the process is slow.

In fact, much attention in Ireland is placed on hard inputs, such as R&D, and hard outputs, such as comparative productivity levels, rather than on the above mentioned Danish flexibility and adaptability, inputs and outputs which refer to quality and reputation. As always it is often the intangibles that are so hard to pin down but so important for success.

Changes, however, are occurring in both regions. Ringkjøbing is seeing its production processes, especially in the clothing industry, moving to lower cost countries, while simultaneously an increasing interest in foreign investment has developed. In Ireland attention has moved slightly towards the development of the indigenous sector and improvements (higher number of new firms and higher standards) are emerging, especially in the sub-contractor sector. Irish public policy to develop the indigenous sector includes the Inter-Firm Co-operation Network Programme, based on the recognition that Danish success revolves around dense networks of firms. However the actual role that the Danish Network Programme has played in the formation of such networks must not be over estimated.

7.3 PUBLIC POLICY AND SUPPORT STRUCTURES

The starting point for a critique of Irish industrial policy lies in two major facts. These are firstly, that a lack of institutional reform has prevented the devolution of power to the regions and counties and secondly, that the over-concentration on foreign direct investment has resulted in a neglect of the indigenous industrial base.

The numerous industrial reports that have been published over the last decade in Ireland have had little noticeable impact apart from the various organisational changes which

have taken place within the Department of Enterprise and Employment and within the agencies for which it has responsibility. In fact, the most obvious weakness of Irish industrial policy has been in the belief that policy proposals, such as the stimulation of clusters, could be created through central direction. This is not by any means a unique problem to Ireland as, although the EU talks of subsidiarity and solidarity, it continues to decide on the direction policy will take. The only difference being that it wants the regions to implement EU programmes through, for example, the Regional Innovation Strategy (RIS) and the Regional Innovation and Technology Transfer Strategy (RITTS) programmes. Denmark similarly has developed programmes at a national level, for example, the Danish Network Programme, which did not prove successful in all the various environments that exist within the country. Ireland's recent adoption of a similar programme must recognise that networking is a social process that develops out of an environment which has mutual trust, social-co-operation and a sense of civic duty at its core. Therefore the Department of Enterprise and Employment must recognise that networking will not be easily arranged by a few public agencies.

Denmark's current shift in focus away from SME's and towards the attraction of foreign investment and large firms with R&D departments is a trend causing some concern due to the generally undesirable impacts on industrial structure in Ireland of such a policy. However, the high skill level in Denmark should ensure against any damage being caused by MNC's to industrial and employment structure as evident from the historical development of flexible specialisation in Denmark. State budget cuts in Denmark have resulted in the withdrawal of direct grant assistance to industry in favour of support through programmes. With uncertainty surrounding the future of structural funds, this may be a direction that Ireland will have to take due to the fact that most of its industrial initiatives receive up to 75 per cent funding from the EU. While EU structural programmes have greatly aided regional policy it masks an underlying failure by the central government to undertake such initiatives themselves.

Currently, the policy of the Danish Ministry of Business and Industry is to endow companies with a good business framework which includes a well-educated workforce, good infrastructure, an efficient public service and well functioning markets. A

comparison of infrastructure, for example, in Ringkjøbing county and the Mid-West uncovers crucial differences. The region possesses an efficient road network, with the current development of a motorway that will link the county to the east of the country, and an air service which has twenty daily flights to Copenhagen is located in Ringkjøbing. However, much dissatisfaction with the road and air network is evident in the Mid-West region. Some roads are in need of urgent attention while four flights a day to Dublin, five flights a week to London and one flight a week to Paris, Dusseldorf and Zurich is clearly not adequate for a region primarily engaged in exporting.

The role of infrastructure must be clarified though as it does not automatically bring firms with it, as was seen in the joint development of Herning-Ikast Industrial Park. Infrastructure must be developed to cater for a specific need, not vice versa, as often the need may not manifest itself.

Denmark appears to have developed a more 'holistic' approach to industrial development, recognising the various elements that need to be in place to permit the creation of new firms. In turn, Ireland may need to rid itself of its focused view of industrial development, which revolves around the stimulation of high-tech R&D and inward investment and view the actual environment and its potential to develop indigenously.

Though the adoption of single policies for an entire nation has been criticised, the actual industrial support agencies and their respective programmes were regarded as good in both regions. However, there is a real need in both regions to reduce the red tape and bureaucracy that surrounds many programmes and to ensure that the requirements of the programme are not so advanced as to exclude disadvantaged firms. Similarly, while the public support agencies in both regions felt that they were the best in the country, firms in the Mid-West region felt that they could have achieved the same rate of performance elsewhere in the country. This not only shows the divide between the perceptions of public bodies and reality on the ground but, may also indicate the weakness in the social structure whereby entrepreneurs are not embedded in a network of inter-personal relationships to which much of their success could be attributed.

Again, both regions are experiencing a degree of overlapping among their various industrial support agencies. In 1996 the Centre for Commerce for the Middle of Jutland was set up to perform a co-ordinating role and in the Mid-West region County Strategy Groups perform a similar function. In both regions a degree of guarding one's own territory exists and firms remain confused as to the actual support available. As identified, firms in the Mid-West region are more concerned with the duplication of administrative costs and calls for greater accountability among public bodies, especially Shannon Development, were strongly voiced. However, in the Mid-West region, much has been achieved through the proliferation of ad-hoc structures, such as the partnership companies and the county enterprise boards, and their benefits may in fact outweigh any negative duplications.

Linkages between industrial support bodies takes place both formally and informally in both regions to an extent that more meetings rather than concrete actions are occurring. There is room for improvement in regional co-operation though, due to the independent nature of the municipalities in Ringkjøbing county and due to the absence of any regional forum in the Mid-West in which industrial policy could be discussed. That is not to say that once a forum were put in place that effective regional planning would follow, as similar to the situation in Ringkjøbing county, independent attitudes must yield to real co-operation and integration to achieve the sustainable development of the region. It is evident in Ireland's Mid-West that more input from firms is required in the process of policy development. However to achieve this their respect must first be gained by showing that they are being listened to, rather than what is currently perceived, i.e. they are listened to and then the agencies do what they had originally planned. The extent of interaction between the 'social-elite' which plan and develop the majority of initiatives in Herning and the rest of the community must be questioned and it is essential for the future success of the municipality that the policy makers and planners are in touch with local needs and wishes. As already noted, perceptions and reality often differ.

7.4 FINANCIAL INSTITUTIONS

While local banks have a traditionally strong position in Denmark, in Ireland they are seen to be subject to a high degree of central control. Both regions complain about the lack of high risk finance and the need to provide security and a good business plan. Such complaints would undoubtedly be made in most regions in Europe. However, the banks in Ringkjobing county have a crucial advantage over their counterparts in the Mid-West region. This is, their local knowledge and understanding of the industries in their area. Due to the clustering of various industries, such as clothing and textiles, the banks have developed an understanding of industrial trends and fluctuations and are thus in a more informed position to take calculated risks.

The new investment fund for entrepreneurs which has been set up in Denmark to alleviate the lack of venture capital represents a concerted effort to address this need. The involvement of industry representatives in the allocation of these resources forms an interesting new partnership between firms and the banks and is a model which could be contemplated in regions in Ireland. Risk capital availability in Ireland at present is minimal and new forms of funding are required to ensure that entrepreneurs do not continue to emigrate or simply stagnate with their ideas unrealised.

7.5 VOCATIONAL TRAINING AND THE APPRENTICESHIP SYSTEM

European experience suggests that vocational education correlates positively with national prosperity levels (see Figure 5.4, P.144). In Denmark two thirds of students undertake a vocational education, in Ireland it reaches only one third. It has been seen, however, that within the Irish vocational education system it has become difficult to differentiate vocational education from other forms of general education. Even if all forms of secondary schools move towards a similar structure, the placing of technical subjects on a par with academic subjects is what is crucial. In Ireland emphasis must in fact change so that the technical curriculum becomes highly valued without compromising traditional academic standards.

Ringkjobing county attributes much of its success to the strength of the apprenticeship system. While the craft culture is still very strong manual occupations are less well esteemed than formerly. As yet it is too early to judge whether the new FÁS 'standards based' apprenticeship system in Ireland will be an improvement on the previous 'time served' system. However, as well as improving the structure of the apprenticeship system a whole change in attitudes is required so that, similar to Denmark, a craftsman would hold a high social standing in the community.

Adult education is being catered for effectively in Ireland, especially through the Vocational Education Committees. However, much can, and needs to be learned from Denmark in relation to continuous training for those in and out of employment. Acknowledged deficiencies in this regard in Ireland have been addressed in the recent White Paper on Human Resource Development. What is important here, however, is the role that other groups could play in this process of continuous training. The study of Denmark highlighted the crucial role of the unions in ensuring the continuous upgrading of skills, such as the AMU-Centres which offer training opportunities to those without formal vocational education, and the role of the firms themselves which engage in management, in-house and out-house training, leading to a process of continual learning. Many firms within the Mid-West have low management skills and more importantly do not see themselves in need of training. Training and retraining of employees is undertaken by FÁS with varying degrees of satisfaction. However, industry itself contributes little to the continuous training of its employees as compared to Denmark and most other EU countries. Thus, while there are undoubtedly problems with the state training body industrialists and the unions have contributed little and their commitment, participation and financial contribution to the process needs to be addressed.

A labour force lacking in the skills required by the market place can not be tolerated in the future and the improvement of both technical and craft education is crucial for the sustainable prosperous development of the country.

7.6 THIRD LEVEL EDUCATION AND R&D

Both regions have a good supply of third level education institutes which appear to be well linked with, and supportive of local industry. Education is at the centre of industrial policy in Herning as it attempts to rectify the dramatic decrease in entrepreneurship which has occurred there. R&D figures are difficult to evaluate as R&D often takes place informally in many firms. Current Danish policy is promoting large firms with R&D departments at the expense of the small flexible firms which are the basis of Danish economic successes. Improvements in R&D in Ireland, in both industry and third level, has relied heavily on EU funds but Ireland continues to rank among the lowest in the OECD in relation to the public funding of higher education research.

Despite the high profile which surrounds technology parks and other public high-tech programmes, such as the Programmes in Advanced Technology (PATs), co-operation with customers and clients remains just as and maybe even more important. In addition it is accepted that learning about technologies occurs primarily via informal channels. Therefore, when it is acknowledged that universities and technology transfer programmes, i.e. the PATs, are not effective enough in promoting their research capabilities to firms, it becomes evident that the under-utilisation of such expensive services is a wastage that needs to be addressed to ensure that firms are up to date with the latest technology developments in their field. In simple terms the research service must become more fully integrated into its locality to ensure a more effective take-up. However, it is essential to accept that technological R&D is simply one element in an innovation system and a more flexible and vocational education at an earlier stage contains the real seeds of innovation.

7.7 CULTURE

While each region will have its own individual culture, particular characteristics, such as a technical and civic culture, are evident in the most progressive regions in Europe. A weak Danish state has led to a country based on strong civil standards, strong

consensus, equality and solidarity. Such factors joined to a long tradition of independence provide the ability and motivation for the creation of a new firm and therefore must be accepted as a major element in the whole process of innovation. There does not appear to be such a recognition in Ireland as, the central control and resultant clientelism, the weak civic, local and regional culture and a culture that seeks security and which is adverse to risk has not been correlated with the weak entrepreneurial culture that exists in Ireland.

A weak regional culture exists in both regions. It exists in Ringkjobing county due to the dominance of the strong local culture. It is the local culture that can be attributed as being a fundamental determinant of the clusters and industrial districts for which the region is known, rather than a regional culture, which, for the purpose of this thesis, relates to the county of Ringkjobing. In the Mid-West region of Ireland, a weak regional culture exists partly due to the lack of any devolution of real powers to the regional level but more importantly due to the absence of a local culture from which regional cultures can emerge. As yet, the cultural situation in Ireland, as described above, is not receptive to the emergence of a strong local, independent culture.

Finally, the dependence on public funding in Ireland must be loosened in order to develop regions where the people have the initiative and ability as a community to develop indigenously, as is the case in Ringkjobing county.

7.8 SUMMARY

Evaluations	Ringkjobing County	The Mid-West Region
Local Government System	<ul style="list-style-type: none"> - very strong, independent - independence hampering regional co-operation 	<ul style="list-style-type: none"> - weak, dependent - no effective regional forum
Industry Structure	<ul style="list-style-type: none"> - concentration on traditional industries - strong enterprise culture - concentration on flexibility adaptability, quality & reputation 	<ul style="list-style-type: none"> - neglect of traditional industries - weak enterprise culture - concentration on R&D & productivity
Public Policy & Support Structures	<ul style="list-style-type: none"> - industrial policy through central direction - shift towards attraction of FDI - developing good business framework - good industrial support agencies - overlapping, duplication & protecting one's own territory 	<ul style="list-style-type: none"> - industrial policy through central direction - over-concentration on FDI - direct grant assistance, largely EU based - good industrial support agencies - overlapping, duplication & protecting one's own territory
Financial Institutions	<ul style="list-style-type: none"> - traditional local control - lack of high risk finance 	<ul style="list-style-type: none"> - central control - lack of high risk finance
Vocational Training and Apprenticeship System	<ul style="list-style-type: none"> - strong technical orientation - craftsman holds high social standing - strong role of unions and industry in training 	<ul style="list-style-type: none"> - weak technical orientation - craftsman holds low social standing - weak role of unions and industry in training
Third Level Education & R&D	<ul style="list-style-type: none"> - good supply of third level institutes - well linked with and support local industry 	<ul style="list-style-type: none"> - good supply of third level institutes - well linked with and support local industry
Culture	<ul style="list-style-type: none"> - strong civil standards, equality and solidarity - very strong local culture - weak regional culture 	<ul style="list-style-type: none"> - weak civil standards, clientelism, seek security - weak local culture - weak regional culture

7.9 CONCLUSIONS

From the above evaluations it becomes evident that the Danish region is closer to the Regional System of Innovation (RSI) which has been developed in Chapter Four (see Figure 4.3, P.118). The major weakness in the Ringkjøbing county RSI lies in its failure to commit fully to the process of regional co-operation, although recent attempts (i.e. the knot centres) may rectify this situation and lead to the stimulation of a regional culture.

With regard to the Irish region many crucial elements of the system are weak or even non-existent. Both Ringkjøbing county and the Mid-West region have a good industrial support structure, despite experiencing some overlapping and duplication, both complain about a lack of high risk finance, although Danish banks appear to have a greater local knowledge and understanding, and both have a good provision of third level institutes. What differs however (see Section 7.8 for a fuller comparison) is the weak state of the Irish local government system, the country's neglect of its traditional industries, the over-concentration on foreign direct investment, the weak technical orientation which prevails in the country and the whole culture of dependency, whether it be on the core or the EU, clientelism and the overall lack of civic standards. It is these fundamental differences which has made one region more successful both socially and economically than the other. It is these factors which need to be addressed to ensure that the weak entrepreneurial culture that currently prevails can be rectified.

Thus, in conclusion, proposals for the future direction of Irish industrial policy are as follows;

- real devolution of powers and functions to the regional and local tiers should be implemented. The principles of subsidiarity and local self government must be fully accepted whereby actions and initiatives can be developed and implemented at local and regional levels.

- with its increased powers, and subsequent increased respect, the Regional Authority could eventually become a regional government which would provide the forum in which industrial policy could be implemented at a regional level. In this situation Shannon Development would become the industrial development arm of the regional government.

- greater attention must be given to the traditional industries and it is critical that they are encouraged to incorporate new technologies to ensure their future survival, and even success as has been shown by the Danish study.

- Ireland must move away from the international infatuation with R&D figures and look more at the adaptability and flexibility of its firms, placing more emphasis on quality and reputation.

- public policy should place a greater emphasis on indigenous development as the way forward for lasting and sustainable development in Ireland.

- EU structural funds is another dependence in the national economy and with its likely phasing out in future years Ireland must at last move from its grant mentality to a supportive role through the provision of a good business framework along the Danish lines.

- the achievement of such a framework will require many varied changes and improvements and some have been mentioned already above. Others will include the improvement of the physical infrastructure, the development of new forms of high risk finance, the promotion of a technically oriented education system, the improvement of training for those both in and out of work and finally an increase in the commitment to third level research.

- this framework will only be achieved if the people themselves strive for these changes, that they will invest in their own future based on strong civic standards. For Ireland to

develop industrially a whole cultural transformation is required in the way in which we think about ourselves and the world around us.

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APPENDIX A

PRELIMINARY FIELD TRIP TO THE MID WEST REGION

JUNE 1996

Organisation

The National Tehnological Park

Meetings Undertaken

Ms Patricia Byrne	Park Director
Mr Dermot O'Neill	Developments Manager
Dr Alice Morgan	Manager of Innovation Centre
Ms Orla Kelly	Marketing Executive
Mr Gerry Glynn	Business Planning Group, Shannon Development

INTERVIEWS UNDERTAKEN IN RINGKJOBING COUNTY

NOVEMBER 1996

Organisation

Interviewee

Public Sector

Municipality of Herning

Mr Jorgen Vaedele Hansen, Head of
Economic and Planning Department

Technological Information Centre

Mr Carston Legh, Director

EURO Information Centre

Ms Hanne Molbak, Director

Museum and Theatre of Herning

Mr K.O. Jensen, Director

Private Sector

Herning-Ikast Chamber of Commerce

Mr Torben Henriksen, Managing Director

Federation of Danish Textiles and
Clothing Industries

Mr Block, Information Manager

Femilet A/S

Mr Jorgen Andsbjerg, Managing Director

Unimerco A/S

Mrs Iben Hansen, Personnel Manager &
Mr Michael Ostergaard, International
Development Department

Green City Denmark A/S

Mr Ole Herold, Managing Director

Education Sector

Herning Institute of Business

Mr Aage Erhardsten, Vice Chancellor

Administration & Technology

Teko Centre

Mr Peer Brant Kristensen, Public Relations
Manager

Danish Export Institute

Mr Barry O'Laughlin, Director

INTERVIEWS UNDERTAKEN IN THE MID WEST REGION

FEBRUARY AND APRIL 1997

Organisation

Interviewee

Public Sector

Shannon Development

Mr Brian Callanan, Planning Officer

National Technological Park

Ms Patricia Byrne, Chief Executive

Forbairt

Mr Billy Wixted, Regional Manager

IDA Ireland

Mr Brendan O'Sullivan, Manager - Mid-West Region

PAUL Partnership

Mr Denis O'Brien, Managing Director

Limerick Enterprise Board

Mr Eamon Ryan, Chief Executive Officer

Nenagh Enterprise Board

Ms Peggy Roche, Chief Executive Officer

Limerick County Borough

Mr Dick Tobin, Planning Officer

Council

Clare County Council

Mr Tom Coughlan, County Secretary

Tipperary (NR) County

Mr Risteard O'Domhnaill, County

Council

Secretary

Mid West Regional Authority

Mr Thomas Kirby, Secretary

Private Sector

IBEC

Mr Declan Grogan, Mid-West Regional Director

Limerick Chamber of Commerce

Mr Brendan Woods, Chief Executive

BMS

Mr Liam Ryan, Managing Director

Quality Software

Mr John Cahill, Managing Director

Inspectron

Mr Paddy O'Dowd, Managing Director

M&M Walsh

Ms Geraldine Clohessey, Managing Director

Panalok

Mr John Devitt, Managing Director

Cegelec ASSL

Mr Seamus O'Sullivan, Managing Director

Ulster Bank

Mr Dermot Flynn, Advisor, Small Firms
Division

Education Sector

University of Limerick

Ms Patricia Flemming, Director of Centre
for Small Businesses

RTC Limerick

Mr John Gleeson, Industrial Liaison
Officer

AMT Ireland

Mr Denis Kearney, Manager of UL
Research Centre

Materials Ireland

Ms Deidre O'Reilly, Manager of UL
Research Centre

FÁS

Mr Phil Duggan, Mid-West Regional
Director

Scarriff Community School

Mr. John Kelly, Principal

Room 364,
Department of Surveying,

Phone No.: 00 353 1 402 3723
Fax: 00 353 1 402 3999

Mr. Aage Erhardsten,
Herning Institute of Business Administration and Technology.

04/11/96

Dear Mr. Erhardtsen,

Following our telephone conversation I hereby provide some further information on my area of study.

I am a research associate on the Strategic Research and Development Programme at the Dublin Institute of Technology carrying out research in the area of 'Regional innovation and Industrial Policies'.

This study aims to identify the factors and conditions necessary to create a climate conducive to sustainable indigenous development and, to the continuous creation of net new economic activities. It centres on the development of a 'Regional System of Innovation' where through both, comparative literary and field research, an ideal set-up will be constructed that will ensure that, a region possesses the ability to create, adapt to, and diffuse innovation in a coherent and systemic manner.

As I mentioned I will be visiting Herning-Ikast from the 18th until the 22nd of November and I want to visit your organisation in order to learn more about the Danish education system and, more specifically, the role of your institute in the region. I am eager to learn how important the education system has been to the success of Herning-Ikast.

I look forward to meeting you and at 10a.m. on Tuesday the 19th of November.

Yours sincerely,

Patricia Doherty.

Room 364,
Department of Surveying.

Phone No.: 00 353 1 402 3723
Fax: 00 353 1 402 3999

Mr. Dick Tobin,
Limerick County Borough Council,
Limerick.

24/03/97

Dear Mr. Tobin,

I am a research associate on the Strategic Research and Development Programme at the Dublin Institute of Technology carrying out research in the area of 'Regional innovation and Industrial Policies', under the guidance of Joe Davis, DIT and Gerry Sweeney, SICA Innovation Consultants.

I will be undertaking a number of interviews with key players in the Mid West region over the course of a week starting the 14th of April, in order to determine whether a "Regional system of Innovation" is in place. These key players include representatives from industrial development agencies, such as, Shannon Development and the County Enterprise Boards, educational representatives, such as, the Industrial Liaison Officer at the RTC Limerick and industry representatives.

I hope to gain an insight to the inter-relationships between the various bodies and agencies and the activities that are currently being undertaken, to determine whether a distinct system, separate from a national one, exists.

In light of this, I would like to speak to you as a representative of a County Council in the region and hear your views on, for example, the changes that will occur due to the current workings of the Devolution Commission and the extent to which all agencies are working together towards the development of the region.

I look forward to hearing from you.

Yours sincerely,

Patricia Doherty.

APPENDIX B

RINGKJOBING COUNTY

Interview Structure for Herning Municipality

Section One

1. Name of organisation:.....
2. Name and position of interviewee:.....
3. Numbers employed (full and part-time).....
4. Role of the organisation:.....

Section Two

5. To what other bodies is the municipality linked and rate the extent of this linkage:

Bodies	v.strong	strong	some	weak	none
Business firms in the area					
Firms outside the area					
Chamber of Commerce					
Local Government					
Central Government					
Education / Training Institutions					
Technological Transfer Agencies					

6. What is the strength of the municipalitie's linkages at the following levels:

Level	v.strong	strong	some	weak	none
Local					
Regional					
National					
International					

7. Do you think that the municipality is networking enough:.....

.....

8. How has the role of the organisation changed:.....

.....

9. How do you perceive the role of other organisations in the area:.....

.....

10. Is there an overlap between the various industrial development agencies or do the complement one another:.....

.....

11. Has a fall in the rate of entrepreneurship occurred in the region:.(If so, any ideas why):.....

.....
.....
12. How would you rate the performance of the overall regional support structure for industry in the region.....
.....

Section Three

13. What is the role of the municipality in relation to local economic development:..
.....
.....

14. What are the positive and negative aspects of this role:.....
.....
.....

15. What recent changes, if any, have occurred within the local authority structure:....
.....
.....

16. What is the relationship between the regional and local government:.....
.....
.....

Section Four

17. Where does the municipality see itself fitting into the regional system:.....
.....
.....

18. What is your own personal identity. Are you part of a locality, region or nation state:
.....
.....

19. To what extent are you aware that you are part of a shared value system, a community spirit:.....
.....
.....

RINGKJOBING COUNTY

Interview Structure for Business Firms

Section One

1. Name of organisation:.....
2. Name and position of interviewee:.....
3. Numbers employed (full and part-time).....
4. Type of Business:.....
5. Proportion of turnover sold outside the region and outside the country:.....
6. Growth pattern of the firm:.....

Section Two

7. To what other bodies is the firm linked and rate the extent of this linkage:

Bodies	v.strong	strong	some	weak	none
Business firms in the area					
Firms outside the area					
Chamber of Commerce					
Local Government					
Central Government					
Education / Training Institutions					
Technological Transfer Agencies					

8. What is the strength of the firm's linkages at the following levels:

Level	v.strong	strong	some	weak	none
Local					
Regional					
National					
International					

9. Do you think that the firm is networking enough:.....
10. Describe the extent of co-operation that exists in the region:.....
11. To what extent is the success of the firm related to:
 - (a) its location.....
 - (b) the support structure.....

12. Are there any major shortcomings in the support structure:.....

13. Is there an overlap between the various industrial development agencies or do they complement one another:.....

14. Has a fall in the rate of entrepreneurship occurred in the region:..(If so, any ideas why):.....

15. How would you rate the performance of the overall regional support structure for industry in the region.....

Section Three

16. What is the extent of continuous training, who does it, what are the resources and how is it perceived:.....

17. How environmentally conscious is the firm:.....

18. How effective do you find the banking system:.....

Section Four

19. Where does the municipality see itself fitting into the regional system:.....

20. What is your own personal identity. Are you part of a locality, region or nation state:.....

21. To what extent are you aware that you are part of a shared value system, a community spirit:.....

RINGKJOBING COUNTY

Interview Structure for Education Bodies

Section One

1. Name of organisation:.....
2. Name and position of interviewee:.....
3. Number of pupils:.....
4. Role of the organisation:.....

Section Two

5. To what other bodies is the college linked and rate the extent of this linkage:

Bodies	v.strong	strong	some	weak	none
Business firms in the area					
Firms outside the area					
Chamber of Commerce					
Local Government					
Central Government					
Education / Training Institutions					
Technological Transfer Agencies					

6. What is the strength of the college's linkages at the following levels:

Level	v.strong	strong	some	weak	none
Local					
Regional					
National					
International					

7. Do you think that the college is networking enough:.....

8. How has the role of the organisation changed:.....

9. How do you perceive the role of other organisations in the area:.....

10. Is there an overlap between the various industrial development agencies or do the complement one another:.....

11. Has a fall in the rate of entrepreneurship occurred in the region: (If so, any ideas why):.....

12. How would you rate the performance of the overall regional support structure for industry in the region.....

Section Three

13. Describe the level of study which can be attained at the institute:.....

14. Describe the extent of R&D undertaken:.....

15. Could you comment on the quality of education and training in the region and the extent to which it has been a factor in local success:.....

16. What is the current status of vocational education in the region:.....

Section Four

17. Where does the municipality see itself fitting into the regional system:.....

18. What is your own personal identity. Are you part of a locality, region or nation state:.....

19. To what extent are you aware that you are part of a shared value system, a community spirit:.....

MID-WEST REGION

Interview Structure for the County Councils

Section One

1. Name of organisation:.....
2. Name and position of interviewee:.....
3. Numbers employed (full and part-time):.....
4. Role of the organisation:.....

Section Two

5. To what other bodies is the Council linked within its county and indicate the strength of this linkage. (5 Very Strong, 4 Strong, 3 Some, 2 Weak, 1 None)

Bodies	if used	Linkage (5-1)	Bodies	if used	Linkage (5-1)
Firms			IBEC		
Shannon Development			Chamber of Commerce		
Forbairt			Teagasc		
IDA Ireland			CEB's		
UL			Partnership Boards		
RTC Limerick			Leader		
Banks			Other		
FAS					

6. To what other bodies is the Council is linked within the Mid West region and indicate the strength of this linkage.

(5 Very Strong, 4 Strong, 3 Some, 2 Weak, 1 None)

Bodies	if used	Linkage (5-1)	Bodies	if used	Linkage (5-1)
Firms			IBEC		
Shannon Development			Chamber of Commerce		
Forbairt			Teagasc		
IDA Ireland			CEB's		
UL			Partnership Boards		
RTC Limerick			Leader		
Banks			Other		
FAS					

7. Do you believe that the Council is networking enough:.....

8. Do you believe that co-operation and networking are important for your continued success and, if yes, do you believe that a culture of co-operation exists in the region:

9. Is the Council currently involved in co-operative projects. If yes, please name the partners:

10. Is there an overlap between the various development/support agencies in the Mid West: Do they need to be rationalised or simply better co-ordinated:

11. Are the County Strategy Groups helping to eliminate this overlap:

12. What do you regard as the major obstacles encountered by firms in the Mid West:

13. How would you rate your level of satisfaction with the overall regional support structure for the manufacturing industry:

(5 Very Good, 4 Good, 3 Adequate, 2 Poor, 1 Very Poor)

Section Three

14. In 1966 the Mid West Regional Development Organisation was set up as an autonomous initiative by the LA's and Shannon Development. Can the new regional structure take over this previous role:

15. In what way is the Council promoting local economic development:

16. What obstacles are in its way to enhance this promotion:

17. In what way do you see the Blue Book and the Devolution Commission overcoming these problems:

18. Is there a need for a system of local government at sub-county level:

Section Four

19. Do you believe that an innovative approach towards development is in place in the Mid West: If yes, where is this activity occurring:

(a) sub-county/local level:.....

(b) county level:.....

(c) regional level:.....

20. Has a fall in the rate of entrepreneurship occurred in the Mid West region:.....

21. Do the development bodies in the region hold sufficient devolved power: If no, do you believe that they are being hampered by such control:.....

22. Do you believe that the various agencies are working towards the development of the region as a whole or is development taking place through the plans of individual agencies without the formulation of a coherent overall regional strategy:.....

23. Do you believe that the region has a system of innovation distinct from other regions in the country. If yes, what do you regard as the distinguishing features.....

MID-WEST REGION

Interview Structure for Business Firms

Section One

1. Name of firm:.....
2. Name and position of interviewee:.....
3. Type of business:.....
4. Indigenous or multinational:.....
5. When established:.....
6. Numbers employed (full and part-time):.....
7. Proportion of turnover which is sold:
 - (a) within the region:.....
 - (b) within the country:.....
 - (c) exported:.....

Section Two

8. How would you rate your level of satisfaction with the overall regional support structure for the manufacturing industry:

(5 Very Good, 4 Good, 3 Adequate, 2 Poor, 1 Very Poor)

9. On starting the business:

- (1) what bodies were used as sources of advice and information and
- (2) rate your level of satisfaction with their service.

(5 Very Good, 4 Good, 3 Adequate, 2 Poor, 1 Very Poor)

Bodies	if used	Satisfaction Rate(5-1)	Bodies	if used	Satisfaction Rate(5-1)
Local Authority			IBEC		
Shannon Development			Chamber of Commerce		
Forbairt			Teagasc		
IDA Ireland			CEB's		
UL			Partnership Boards		
RTC Limerick			Leader		
Banks			Other		
FAS					

10. During the on-going development of the business please:

- (1) indicate the frequency, if any, with bodies in the region:
(3 Very Frequent (up to 1 month), 2 Frequent (1-6 months), 1 Infrequent (over 6 months))
- (2) and rate your level of satisfaction with their service.

(5 Very Good, 4 Good, 3 Adequate, 2 Poor, 1 Very Poor)

Bodies	Freq- uency	Satisfactio n Rate(5-1)	Bodies	Freq- uency	Satisfaction Rate(5-1)
Local Authority			IBEC		
Shannon Development			Chamber of Commerce		
Forbairt			Teagasc		
IDA Ireland			CEB's		
UL			Partnership Boards		
RTC Limerick			Leader		
Banks			Other		
FAS					

11. On starting the business was the financial support on offer, both state sector and private sector financial support, adequate for your needs. If no, please state their major weakness:

.....
.....
.....

12. Indicate any state industrial support programmes that you have availed off or are availing off and please rate your level of satisfaction with those used.

(5 Very Good, 4 Good, 3 Adequate, 2 Poor, 1 Very Poor)

Programme

Level of Satisfaction

- (a).....
(b).....
(c).....
(d).....

13. Please name the most significant source of information and help on starting the business:.....

14. If any significant product or process developments have occurred during the on-going development of the business please name the most significant source of assistance:

.....
.....

Section Three

15. Is the firm a member of any business or other organisations within the region:

If yes, please name:.....
.....

16. Is the firm involved with other firms or agencies in the region in co-operative projects or out-sourcing:.....
.....

17. What is the strength of your interrelationship with the following in the Mid West region: (5 Very Strong, 4 Strong, 3 Some, 2 Weak, 1 None)

- (a) other business men:.....
(b) customers:.....
(c) suppliers:.....

18. Is co-operation and networking important for your continued success:.....

19. To what extent is the performance of the firm is related to:

(a) its location within the Mid West:.....

(b) the support structure:.....

20. Does an overlap exist between the different development/support agencies:.....

If yes do they need to be rationalised or simply better co-ordinated:.....

21. Are you engaged in continuous training. If yes, who carries it out and how is it funded:.....

Section Four

22. Do you believe that an innovative approach towards development is in place in the Mid West. If yes, where is this activity occurring:

(a) sub-county/local level:.....(b) county level:.....(c) regional level:.....

23. Do you feel that decisions are being made within the region in which you have had no participation:.....

24. Has a fall in the rate of entrepreneurship occurred in the Mid West region:.....

25. Do you believe that the development bodies in the region hold sufficient devolved power. If no, do you believe that they are being hampered by such control:.....

26. Do you believe that the various agencies are working towards the development of the region as a whole or is development taking place through the plans of individual agencies without the formulation of a coherent overall regional strategy:.....

MID-WEST REGION

Interview Structure for UL and RTC

Section One

1. Name of institute:.....
2. Name and position of interviewee:.....
.....
3. Number of students:.....
4. Role of the institute:.....
.....
.....

Section Two

5. To what other bodies is the Institute linked within the Mid West region and indicate the strength of this linkage.

(5 Very Strong, 4 Strong, 3 Some, 2 Weak, 1 None)

Bodies	if used	Linkage (5-1)	Bodies	if used	Linkage (5-1)
Firms			IBEC		
Shannon Development			Chamber of Commerce		
Forbairt			Teagasc		
IDA Ireland			CEB's		
UL / RTC Limerick			Partnership Boards		
FAS			Leader		
Banks			Other		
Local Authority					

6. Do you believe that the Institute is networking enough:.....
.....
7. Is co-operation and networking important for the continued success of the institute. If yes, do you believe that a culture of co-operation exists in the region:.....
.....
8. Is the Institute currently involved in co-operative projects or joint R&D. If yes, please name the partners:.....
.....
9. Does an overlap exist between the various development/support agencies in the Mid West. If yes, do you believe that they need to be rationalised or simply better co-ordinated:.....
.....
10. What do you regard as the major obstacles encountered by firms in the Mid West:.....
.....

.....
11. How would you rate your level of satisfaction with the overall regional support structure for the manufacturing industry:

(5 Very Good, 4 Good, 3 Adequate, 2 Poor, 1 Very Poor)

.....
Section Three

12. What is your view on whether Ireland should engage in basic research, or largely engage in applied research:.....

.....
13. The percentage of firms in the Mid West which are in co-operation with third level institutes is below the national average. What is your explanation for this:.....

.....
14. Do you believe that the education institutes are innovative and remaining in touch with industry needs in the region:.....

.....
15. The IBEC Report states the need for certificate and diploma courses tailored to identifiable industry training needs. Do you expect increased consultation with industry representatives to rectify this:.....

.....
16. Are third level institutes losing a large proportion of new knowledge generated to other regions and countries:.....

.....
Section Four

17. Is an innovative approach towards development in place in the Mid West. If yes, where is this activity occurring:

(a) sub-county/local level:.....(b) county level:.....(c) regional level:.....

18. Has a fall in the rate of entrepreneurship occurred in the Mid West region:.....

.....
19. Do you believe that the development bodies in the region hold sufficient devolved power. If no, do you believe that they are being hampered by such control:.....

.....
20. Do you believe that the various agencies are working towards the development of the region as a whole or is development taking place through the plans of individual agencies without the formulation of a coherent overall regional strategy:.....

.....
21. Does the region have a system of innovation distinct from other regions in the country. If yes, what do you regard as the distinguishing features:.....

MID-WEST REGION

Programmes in Advanced Technology

Completeness

1. Are the PATs meeting the objectives of:

(a) developing third-level capability

.....

.....

(b) delivering key technologies to firms in Ireland.....

.....

.....

(c) the attraction of overseas investment in high technology areas.....

.....

.....

2. Tierney talks of the limited impacts which the PATs were having on indigenous firms. Was this the case and is it still so?.....

.....

.....

3. Are the PATs economically successful? What are the spin-offs of the PATs - turnover, new firm start up? Do you see them becoming self-sufficient?.....

.....

.....

.....

4. How many are employed and what is the wage and salary bill?.....

.....

.....

5. Environment - are the PATs in the area of clean technology, does the final product have any impacts on the environment?.....

.....

.....

6. Social/Cultural - has it resulted in the retention of graduates and is the programme integrated into the society through, for example, contact with other bodies in the region?.....

.....

.....

7. Diversity - PATs concentrated by nature but, are they diverse in their range of functions?.....

.....

.....

8. Subsidiarity - although devolved from a central body how much freedom are they actually given?.....

.....
.....
.....
9. Partnership - are there industrial representatives on the board? Have they any links with bodies such as Shannon Development, the innovation centre, etc? Is there a representative from Forbairt on the board?.....
.....
.....

.....
10. Have the PATs given enough emphasis to application research and technology transfer? Are they catering for the needs of indigenous industry?.....
.....
.....

.....
11. Are the PATs well distributed around the various campuses?.....
.....
.....

.....
12. Are the benefits of the research distributed throughout the country with the dispersal of information?.....
.....
.....

Consistency (of targets)

1. Do the procedures from one PAT to another vary and are there any overlapping of operations? Is there much sharing of information between different campuses?.....
.....
.....

.....
2. Are the PATs meeting their targets, are they consistent?.....
.....
.....

.....
3. Are the targets of the PATs complementary or do some contradict?.....
.....
.....

.....
4. Who are your target population?.....
.....
.....

Concreteness

1. Do you feel that the policy is sustainable, i.e., through the creation of new PATs and the dissolving of those that are obsolete?.....

.....
.....

2. Are the PATs over-dependent on EU funding?.....

.....
.....

3. In terms of sustainability what quantitative and qualitative standards are to be met. How do the PATs determine their success rate? Can economic sustainability be evaluated through the number of contracts, patents, etc?.....

.....
.....
.....

MID-WEST REGION

Techstart Programme

Completeness

1. Do you believe that techstart has been meeting its aim to help companies to make better use of technology?.....
.....
2. Do you think that Tierney's proposal to increase techstart placements from 200-500 was "too ambitious"?.....
.....
3. Do you feel that the additional £700,000 that was made available in 1996 was suffice?..
.....
.....
4. Social/Cultural - Have there been any social ramifications from the introduction of this programme in the region, i.e. is it enabling more students to stay in the region?.....
.....
.....
5. Economy - are the financial investments worth the outcomes? Have there been any spin-offs such as the growth and creation of new firms through the experience gained in techstart?.....
.....
.....
6. Environment - is there a policy of choosing placements in firms that have strict environmental regulations? Also, is the special techstart programme on Environmental Mgt and Control going to be the new growth area in regards to placements?.....
.....
.....
7. While a national programme does subsidiarity exist whereby decision making is at the regional level?.....
.....
.....
8. Partnership - was is the extent of linkage with other bodies in the region? What is the composition of the board?.....
.....
.....
9. How many students were placed in the region last year and are they predominately from the region?.....

10. Diversity - are students placed in various industries which cover a wide variety of sectors?.....

11. Are the benefits of the programmes spread throughout the whole region?.....

12. Are students being placed in the same number in other regions?.....

Consistency

1. Was the techman programme introduced as a complimentary measure?.....

2. Is there much dialogue with the various employers to ensure that the targets set are consistent?.....

Concreteness

1. Do you feel that the programme is over-reliant on EU funding?.....

2. Is the standard of student expertise and the type of work offered by the employer continually monitored to ensure that the highest standards are maintained to ensure the sustainability of the programme?.....

3. How many techstart students have stayed on in their placement firm and are the firms still willing to take on students (have all the firms in the region been used)?.....

4. Are there specific targets to be met, for example, the number of students to be successfully placed?.....

APPENDIX C

THE ADMINISTRATIVE FRAMEWORK FOR INDUSTRIAL DEVELOPMENT

1937 heralded the enactment of the Irish Constitution which provided for a government that shall consist of not less than seven and not more than fifteen members. The current government (1996) consists of sixteen departments, with one minister holding two portfolios. The following discussion will centre on those departments involved in some form with economic development and their representation at regional and local level.

Department of an Taoiseach

Central Level

The department is concerned with the carrying out by the Taoiseach of his/her functions under the Constitution and under statute. It represents the channel of communication between the government departments and the President. Additional responsibilities include the National Economic and Social Council, Government Information Services, the Law Reform Commission, the Central Statistics Office and Western Development and Rural Renewal.

Regional Level

The *Western Development Partnership Board* was established in October 1994, as a response to the initiative of the people of the West with the primary task of preparing an action plan "to establish what can be done to reverse the economic and social deprivation in the Western Region and to redress the persistent loss of population" (Western Development Partnership Board, 1996, P.5). In response to the initiatives proposed in the recently published plan entitled 'The Challenge: A Positive Future Through Action', the Government has stated that the Western Investment Fund and the Western Development Commission, which will take over from the partnership board, are to be established. A Social Development Unit for the West is to be considered, NESC is to carry out a study of settlement patterns, Local Enterprise Networks are to be encouraged, the Minister for Western Development and Rural Renewal will coordinate responses on sectoral issues and the Government is to propose more

effective agricultural and fisheries policies to support small farmers (Dept of an Taoiseach, 1996).

Local Level

34 Area Partnership Boards, established in 1991, seek to combat the problem of long-term unemployment under the Programme for Economic and social Progress (PESP). A National Coordinating Team (NCT) comprises representatives from various agencies including, FÁS, the Vocational Education Committees, the Irish Congress of Trade Unions and additional input from the Irish Business and Employers Confederation and the Combat Poverty Agency. The thirty four boards are located in areas of long-term unemployment and have equal representation from state agencies, social partners and the local community. The boards are required by the NCT to formulate action plans to suit local needs and the emphasis has rested on education and training. Over ninety per cent of funding is provided by state agencies such as FÁS, Cert and Teagasc (Collins & Walsh, 1995). In 1992 Area Development Management, an independent company, was established by the EU and the Government to evaluate, monitor and allocate funds to the area partnership boards. This managerial role will run until 1999.

Department of the Environment

Central Level

The department is concerned with the development and implementation of policy and programmes in relation to the environment, provided mainly through the local government system. Additional responsibilities include An Bord Pleanála, the Environmental Protection Agency and the National Roads Authority.

The role of the *Environmental Protection Agency (EPA)* established in 1993 includes regulation and control of the processes which hold significant polluting potential and overseeing the performance by local authorities of their environmental functions (STIAC, 1995).

The *National Roads Authority* established in 1994 was given overall responsibility for the major roads in the country although County Councils under license from central government may be permitted to maintain them.

The establishment of these two bodies reduced further the role and power of local authorities.

Regional Level

From the first of January 1994 the Government established eight *Regional Authorities* whose initial role is to monitor and advise on the implementation at regional level of the various Operational Programmes under the EU Structural Funds. Each Authority is required to produce a regional report. While still at an early stage of development the new regional authorities may simply re-create the role held by the RDO's which were abolished in 1987. Unfortunately they appear to be more of a reaction to the EU requirement for more regional input than a central initiative promoting greater autonomy.

Local Level

Local Authorities - Local government consists of 29 County Councils, 5 County Borough Corporations and 49 Urban District Councils. With the abolition of domestic rates in 1978 the money lost by local authorities has been replaced by a block grant from central government. Their functions are housing and building, road transport and safety, water supply and sewerage, development incentives and controls, environmental protection, recreation and amenity, agriculture, education, health and welfare and, miscellaneous services (financial management, elections, consumer protection, etc.) (Collins & Walsh, 1995, P.1-234). Local autonomy is not part of the Irish tradition and correspondingly resources to extend their powers have not been forthcoming. Central government maintains tight control devolving little power to the LA's in spite of recent work by the Devolution Commission. Likewise proposals in the report "Better Local Government - A Programme for Change" (Department of Environment, 1996), hold linking the local Government and local development systems as its central feature with the absence of any real devolution of powers and functions.

Department of Enterprise and Employment

Central Level

The department holds responsibility for industrial development policy, science and technology, company and patent laws, consumer protection, manpower policy, etc. Additional responsibilities include the Office of Science and Technology, Forfás, Forbairt and IDA Ireland.

Established in 1987 the *Office of Science and Technology* represented a major breakthrough since a Minister for Science and Technology has existed at cabinet level in many other OECD countries for decades (Circa, 1994). An additional £4 million was allocated for science and technology programmes in 1996 which are aimed “at creating an economy and a business sector where competitiveness is founded on innovative and high quality products, processes and services, using a high skilled workforce”, (Enterprise & Innovation, 1996, P.7). The latest scheme announced in May 1996 is a four year programme that aims to improve the planning, management and exploitation of R&D in companies. Entitled the ‘R&D Management Development Scheme’ it will provide companies with a range of training modules to meet their different needs (Rabbitte, 1996). Under the 1994-1999 Operational Programme for Industrial Development, *Measure 1 of the Research and Development Sub-Programme* funds R&D in all branches of industry and was estimated to amount to £14m in 1996 (Forfás, 1996b). All financial supports for company-led R&D is brought together under this heading and is administered by the industrial development agencies. The measure is open to all companies regardless of their size or ownership.

Established in 1994 *Forfás* is the policy and advisory board for industrial development in Ireland and holds statutory responsibility for science and technology coordination and policy advice (Forfás, 1995). It advises the Minister for Enterprise and Employment on the development of industry, advises Forbairt and the IDA on the development and coordination of policy and encourages the development of industry in Ireland (STIAC, 1995).

Forbairt, established in 1994, aims to foster industrial development through the promotion and stimulation of indigenous industry and through the development of science and technology in the country. The Forbairt Mission 1995-2000 states that it will use its resources and influences to create more jobs for people in Ireland by helping Irish businesses to increase their growth in sales.

Programmes include:

- Programmes in Advanced Technologies (PATs) - incorporated in the Science and Innovation Directorate they are designed, “to contribute to the world competitiveness of existing industry and aid the establishment of technology driven start-up companies” (Enterprise and Innovation, 1995).
- National Technology Audit Programme - aimed at the development of Irish SME’s by identifying opportunities within SME’s which will enhance their profitability, reduce costs, etc.
- Business Innovation Centres - assist in the detection, formation and growth prospects of new and existing small enterprises.
- Techstart Programme - a practical programme which helps companies improve their use of technology. Forbairt maintains a database of technical graduates which is used to find the right match between the needs of companies and the technical skills of graduates. A similar Techman Programme places managers in these companies.
- National Linkage Programme, Mentor Programme, etc.

Due to structural reform under the White Paper on Human Resource Development (Department of Enterprise and Employment, 1997), Forbairt will now also assume responsibility for training in enterprise.

IDA Ireland. The Industrial Development Authority existed from 1949 until 1993 and held the responsibility of stimulating job creation in the manufacturing and financial

services, of encouraging the purchase of Irish products and promoting industrial development in Ireland (STIAC, 1995). In 1994 it became the *Industrial Development Agency* and now holds sole responsibility for attracting overseas industrial investment to Ireland, with its regional structure becoming the responsibility of Forbairt.

Regional Level

While predominately a central development agency *Forbairt* has ten regional offices located to assist local businesses.

The *Shannon Free Airport Development Company (SFADCo)*, or *Shannon Development*, as it is more commonly known was established in 1959 originally to promote the development of Shannon Airport. This remit has been extended over the years and it is now an integrated development agency responsible for a wide variety of activities in the region including; air traffic promotion at Shannon airport, the Shannon Free Zone, the Shannon World Aviation Park, tourism and rural development in the Shannon Region and management and development of the National Technological Park at Plassey. The underlying principle of coordinated and innovative regional action to bring about economic development has constantly guided the Company's actions since it was created.

FÁS (Foras Áiseanna Saothair) the national Training and Employment Agency currently provides an employment/recruitment service with fifty four Employment Services Offices and twenty Training Centres located in ten regions. Through its training centre network FÁS provides close to one hundred and seventy different training courses in the industrial and commercial fields for school leavers unable to find employment, for the unemployed and for those wishing to update their skills. Training for apprentices is provided at the FÁS training centres, the RTC's and at DIT. At present there are twenty five trades catered for ranging from engineering and construction to printing and furniture. However, FÁS has been subject to much criticism in recent years as most of its expenditure appears to be devoted to short term training programmes for the unemployed (Collins & Walsh, 1995). Its latest scheme

'Jobstart', for example, offers a subsidy of £80 a week to employers to recruit people who have been on the live register for at least three years.

Again, due to structural reform under the White Paper on Human Resource Development (Department of Enterprise and Employment, 1997), FÁS will hold responsibility solely for delivering quality training for people entering or re-entering the labour market. As mentioned, Forbairt will assume the role of training in enterprise, while a new National Employment Service will assimilate the employment service that FÁS undertook.

Local Level

The 35 *County Enterprise Boards* established in 1992 work "to develop economic potential, stimulate business activity and support enterprise initiatives in its own local authority area" (Dept. of Enterprise & Employment, 1994). Each board represents a partnership between local businesses, voluntary groups, social partners, which includes business and trade union partners, state agencies and local elected representatives. A gap existed at the micro-industry level and the boards have stepped in to support and encourage the development of enterprises.

Department of Agriculture, Food and Forestry

Central Level

The department is concerned with the promotion and development of the agricultural, food and horticultural industries. It operates and implements EU schemes and regulations providing grants for farm improvements, quality control, elimination of animal disease, etc. The forestry service is responsible for national forestry while functions relating to commercial forestry have been transferred to Coillte, the Irish Forestry Board.

Teagasc, the Agriculture and Food Advisory Board was formed in 1988 through the amalgamation of ACOT and An Foras Taluntais and provides advice, research,

education and training services to the agricultural and food industry. The goals according to its Mission Statement for 1995-1999 are to;

- raise the competitiveness of agriculture and the food industry,
- ensure the continued viability of the maximum number of farmers and
- stimulate enterprise development and employment in rural communities (Collins & Walsh, 1995, P.1-238).

Local Level

Leader is a European Union initiative on rural development. The objective of *Leader* is “to encourage and assist rural communities to develop their own ideas in accordance with their own priorities” (Dept. of Agri, Food & Forestry, 1994). It is therefore in essence a bottom-up process involving communities in their own development. *Leader I* ran from 1992 until December 1994 with a total investment of £80 million. It enabled over 3,000 projects to be supported in fields such as rural tourism and SME’s and some 2,000 jobs were created (Dept. of Agri, Food & Forestry, 1994). *Leader II* will run from 1995 until 1999, has the support of £95 million in public funding and will support; animation, capacity building and training, rural tourism, small firms, craft enterprises and local services, the development and marketing of local produce and the preservation and improvement of the environment and living conditions.

Department of Education

Central Level

The department is responsible for the administration of public education, primary, post primary and special education. The department also oversees the state subsidies for universities and colleges.

In 1989 the two National Institutes (NIHE Limerick, NIHE Dublin) were designated as universities, renamed the University of Limerick and Dublin City university and now hold the same status as Trinity College Dublin, the constituent colleges of the national University of Ireland, those being, University College Dublin, University College Cork and University College Galway and the National College of Art and Design. The Dublin

Institute of Technology (DIT) and the Regional Technical Colleges (RTC's) were placed on a statutory footing in 1993.

The *Higher Education Authority*, the coordinating and funding body for universities, is currently extending its remit on a phased basis to include all publicly funded third level colleges thus including DIT and the RTC's. While many of the courses offered by the traditional universities are academic in nature DIT and the RTC's provide more vocationally oriented courses at certificate, diploma and degree levels, retaining a special focus on the needs of the job market.

Regional Level

Eleven RTC's are currently in operation offering certificate, diploma and degree courses with reference to the occupational and skill needs of the economy. Course content ranges from craft to professional level educating for the trade and industry needs of the region.

Structural change is taking place within the education system. First evident in the White Paper on Education (1995), it talked of the 'functional inefficiencies' that have resulted from schools relating individually (excluding those in the Vocational Education Committee (VEC) sector) to the Department of Education. At present 3600 primary and post primary schools deal individually with the Dept. of Education, while a further 246 schools operate within the VEC sector (Bhreathnach, 1996). In June of 1996 the Government announced the devolution of the education services to the regions through the establishment of 10 new Education Boards. It was stated that "the establishment of the Education Boards will mean that there will be a structure in place that will be more responsive to the needs of their regions" (Bhreathnach, 1996). In conjunction with this announcement the government was presented with a report proposing the rationalisation of the number of VEC's and is under consideration by a Steering Group.

Local Level

In the *second level education* sector there are 782 publicly aided schools consisting of 461 secondary, 246 vocational and 73 comprehensive or community. Education at

secondary level consists of a three year junior cycle which culminates in the Junior Certificate examination and a two year senior cycle (a one year Transition year before senior cycle is optional) which offers a choice of three two-year Leaving Certificate programmes. These are, the Leaving Certificate Programme, the Leaving Certificate Applied and the Leaving Certificate Vocational Programme. While the compulsory leaving age from school, is fifteen this is being changed to sixteen or the completion of three years of the junior cycle (which ever is later) (White Paper on Education, 1995).

The *primary education system* comprises 3,200 primary schools, 115 special schools and 73 private primary schools that receive no funding from the state. Children in Ireland are not obliged to attend primary school until the age of six although almost all of five year old are enrolled in a primary school (White Paper on Education, 1995).

Department of Arts, Culture and the Gaeltacht

Central Level

The department is responsible for the formulation of national policy relating to arts and culture and the promotion of the cultural, social and economic welfare of the Gaeltacht.

Regional Level

Údarás na Gaeltachta aims to increase employment in Irish-speaking rural areas thus reducing out-migration. It will provide financial assistance for the development of new industries and innovative projects in these areas. The board of Údarás na Gaeltachta has thirteen members, seven selected by the people of the Gaeltacht, six nominated by the Minister for Arts, Culture and the Gaeltacht.

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