**CENTRE FOR THE STUDY OF ECONOMIC & SOCIAL CHANGE IN EUROPE**

SCHOOL OF SLAVONIC & EAST EUROPEAN STUDIES

# "Industrial Policy and European Integration: lessons from experience in Western Europe over the last 25 years"

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# Abstract

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This paper seeks to draw together the work undertaken for the EU (Fourth Framework Programme) TSER project on Science, Technology and Broad Industrial Policy with the experience of the countries of East and Central Europe (CEECs) as it has been catalogued through the papers written for this ESRC Programme on the Emerging Industrial Architecture of the Wider Europe. The former project sought to explore developments in science, technology and industrial/innovation policy in six Western European countries – France, Germany, Italy, the UK, Sweden and Ireland – through the last 25 years of the 20th Century and found a process both of integration (in the sense both of a growing together of economies and a coming together of policies) but also of co-evolution, with national policies co-existing with new strong strands of policy emerging at both EU and regional levels of government.

**What role for industrial policy?**

The paper begins by defining industrial policy as a mix of institution building and incentive structures. It emphasizes the importance of institutions to the proper functioning of markets, a lesson that has been learned in other contexts in the CEECs, but also the degree to which institutions both reflect and shape cultures. While the process of accession provides an important stimulus to institution building, it is important that each country listens to its own stakeholders and shapes its own institutions. The non-globalisation of institutions in the member states of the EU helps to explain the degree to which national policy still plays such an important role in the industrial policy area, but it also helps to provide for a wealth of experience from which to draw. It is important to promote flexibility, but not too much – change is a good thing, but in moderation; too much change can be destabilising.

**Globalisation and Integration**

The paper then continues by examining changing industrial environment and the degree to which, during the last 25 years, the process of European integration has been played out against a background of globalisation. It suggests that while the 1970s might be dubbed 'the age of the national champion', the 1980s was marked by the emergence of a series of large and successful multinational, but European, firms and the 1990s by a series of trans-continental mergers from which a number of truly global companies had emerged. These latter changes had been accompanied by a dramatic shift in control, away from country (and often family) based management systems towards systems run by professional managers and institutional investors. Given global oligopoly in many sectors, these companies operate in a world of intense competition in which costs and innovation are key factors. The search for economy has led to downsizing and outsourcing; the search for new products and new

markets had spread operations widely around the globe. Together it makes for a world in which foreign direct investment (FDI) is fickle and seeking to compete on labour costs alone uncertain; in which small and medium sized businesses (SMEs) play an important role in supply chains, but have to be able to meet the quality control and 'just in time' requirements of the MNCs; and in which much hope (arguably too much hope) is centred upon the new, but still small, technology based firms (NTBFs) as potential MNCs for the future.

**Policy has adapted and will have to go on adapting to this changing environment**

It is this world in which the CEECs have to make their mark and compete. The paper notes that in response to these trends, policy in Western European countries has adapted. Over the last 25 years a number of clear trends are discernable: from intervention to laissez faire; from policy concentrating on large firms to policy concentrating on SMEs; from policy concentrating on national issues to policy concentrating on regional issues; from mission oriented, often sector based policies to diffusion oriented policies; from subsidies to physical capital to subsidies for human capital.

**Specific areas of industrial policy**

The paper then examines developments in a number of different policy areas:

- **FDI** – foreign capital is playing a vital role in opening up and revitalizing the economies of the CEECs, but the lessons from Ireland, in particular, suggest that it pays to discriminate in favour of FDI which brings more than just jobs but also training in skills and management from which indigenous capabilities may emerge;
- **Competition policy** – anti-trust, monopoly and merger control have emerged as three key areas of European policy. While the Commission is keen to see restructuring which makes the most of the advantages of the single market, it is equally necessary to ensure that positions of dominance are not abused. National policy here must play a significant, and complementary role, to EU policy;
- **State Aids policy** – commonly regarded as the main core of industrial policy, this has been one of the areas where the Commission have in fact developed a powerful position, laying down clear guidelines, restricting the use of ad hoc measures and and generally dampening expectations of what national governments may do to help stricken sectors.
- **Regional policy and the Structural Funds** – the paper highlights the growing role of regions in Europe in developing 'bottom-up' support networks linking SMEs not only with each other but also with local universities and technical colleges, local bankers and venture capitalists, local government and local big business. The Structural Funds have played a vital part in encouraging regional self-confidence, but to date too much money is swallowed up in capital intensive developments (roads and bridges) and not enough by innovation and human capital;
- **Science, technology policy and the Framework Programmes** – the paper emphasizes the degree to which collaboration through the Framework Programmes has provided opportunities for scientists from the less developed countries of Europe to learn what world class science and technology means, but also points out that it is excellence in basic science that is the key attractor for high value MNC investments;

**Some more general policy conclusions**

The paper concludes by suggesting that there are a number of more general lessons for the CEECs to be drawn from the experience of 'older' member states:

- It helps to have a clear vision of where you want to go and how you propose to get there, and the more open a government is about this, involving different 'stakeholders' in the preparation and revision, the more it becomes a shared vision and one that the population as a whole will support and 'buy into';
- Given the importance of creating added value in a knowledge-based economy, government, industry and academe become three complementary players. Their inter-relationship, sometimes referred to as the triple-helix relationship, underpin the process of economic development.
- Over time the science base can become the nucleus of a successful economy both in terms of attracting investments bringing high value added jobs and in terms of creating skills and capabilities necessary to generate future investment. But the science base does not come for free. It requires continuous investment, and, while encouraging 1000 flowers to bloom has its attractions, few countries, and especially small countries, can excel at everything. International co-operation and focus of effort complement each other.
- Equally university laboratories, firms and government research institutes can only benefit from co-operation if their scientists and engineers are well versed enough in science and technology to be able to understand and make use of modern techniques. Successful technology transfer depends upon person-to-person contact. Both public and private sectors have to invest enough in R&D to develop and maintain sufficient competence to remain members of the 'international club'.
- The general maxim of devolving responsibilities to the lowest feasible level both accords with the principle of subsidiarity and helps to create a sense of involvement, shared vision and shared experience. It is vital, however, to have all level of government working in the same direction and complementing each others' policies by their own actions.
- While SMEs become a vital part of the economy, it is important to remember that they too learn not from glossy brochures and government pronouncements but by word of mouth and personal contacts. Networking, at all levels is essential. It is futile to have Brussels, the national and regional governments, all vying with each other to develop such networks. In most cases it is simpler, more efficient and more economic to use the regional tier of government to stimulate networks among SMEs, and in a number of instances such a policy has been amazingly successful.

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# Industrial Policy and European Integration: Lessons for the countries of Eastern and Central Europe from experience in Western Europe over the last 25 years

**Paper written for the ESRC Project 'The emerging industrial architecture of the wider Europe: the co-evolution of industrial and political structures (Award L312252037)**

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# Industrial Policy and European Integration: Lessons for the CEECs from experience in Western Europe over the last 25 years

## Section 1 – Introduction

The purpose of this paper is to explore the lessons to be learned by the Central and Eastern European countries (CEECs) from the experience in the industrial policy arena of Western Europe over the last 25 years. It draws substantially from the work undertaken in a project within the EU's Targeted Socio-Economic Research programme (TSER) entitled "Science, Technology and Broad Industrial Policy" (Sharp, 2001). This project investigated the co-evolution of science, technology and industrial policy in six member states of the European Union over the last quarter of the twentieth century. The aim is to use this research and consider it within the context of the work undertaken for the ESRC programme on the Emerging Industrial Architecture of the Wider Europe.

The purpose of the TSER project was to investigate the development of science and technology policy alongside industrial/innovation policy over the years 1975-1997 in six Western European countries – France, Germany, Italy, the UK, Sweden and Ireland. It found both a process of integration (in the sense both of a growing together of economies and a coming together of policies) but also of co-evolution, with national policies co-existing and helping to shape new strands of policy emerging at EU and regional levels of government. The aim of this paper is to illustrate this process of integration and co-evolution and to consider ways in which the CEECs might develop their own policies to maximise the benefit to be secured in this area from membership of the European Union.

### *1.1 – What role for industrial policy?*

#### *1.1.1 – State aids policies and market failure*

It may be worth at this stage defining what is meant by industrial policy. Traditionally it has been associated with what today is referred to as "state aids policy" – namely with governments using relatively crude taxes and subsidies to persuade customers and producers to act in ways in which, left to their own devices, they would be disinclined to do. In particular subsidies have been used to persuade producers to keep open facilities and jobs which in other circumstances would not be viable; in other words, governments trying to best guess the market and use subsidies as incentives to persuade people to do as they (governments) wish. In this regard economists have tended to condemn industrial policy as interventionist and to dismiss it as a legitimate and useful tool in the hands of governments.

It is wrong, however, to see industrial policy in these narrow terms. Indeed *laissez faire* in itself constitutes a policy – the decision to allow industry a free hand and not to intervene. Often, even from a neo-classical perspective, there are perfectly respectable and even compelling reasons for governments to intervene. For example, it is widely acknowledged that market failure justifies intervention to control monopoly, both in terms of dominant position and collusion. A different sort of market failure justifies intervention in relation to R&D – here the failure of the market to cope with risk and (especially) uncertainty gives some justification for saying that left to itself the market would not provide adequately for the needs of society. And again, spillovers from R&D (benefits going to other than those who

pay for it) mean that it is often impossible to ring-fence and charge those who benefit from the expenditures. Patents – the granting of monopoly rights over the use of novel ideas – can be justified in order to encourage the development of new ideas. Infant industry protection has been (and still is) justified as necessary to enable new industries to establish themselves and gain benefit from economies of scale. Collaboration is not collusion when justified by the need to cope with indivisibilities of equipment (large projects) or (today) the dynamics of knowledge transfer. In other words, even the non-interventionist neo-classical approach embodies a good deal of flexibility and some sort of reasoning can usually be found to justify action if necessary. Note, however, that the action required by government is either regulatory (as with competition policy or setting up rules for the granting of patents) or looks to fiscal action through the imposition of appropriate taxes or subsidies. Implicit in such actions is the existence of a set of institutions ready and able to act in accordance with government instructions.

*1.1.2 – New growth theory and the role of institutions*

The neo-classical approach to the role of government described in the previous paragraph hinges on the issue of market failure, with a central role played by the concept of externalities – the degree to which action affects, or is affected by, others not party to the initial decisions. An alternative phrase which is frequently used is that of 'spillover'. The idea of spillovers or externalities underlies the new growth theories developed in the 1980s. (Aghion and Howitt, 1990; Grossman and Helpman, 1991; Romer, 1986, 1990). In many respects these theories represent a dynamic extension of the neo-classical approach. Firms benefit not only from static economies of scale and scope but also, over time, from the cumulative learning embodied in building up and maintaining a production process. In particular these theories emphasise the externalities associated with R&D and the degree to which growth emerging from technological advances is 'endogenised' – that much new capital equipment incorporates new technical ideas but those already familiar with the concepts often find it easier to exploit them than those challenging from outside. As with infant industry protection, governments are justified in pursuing policies which help firms (and the economy as a whole) move onto a virtuous growth path by picking up and using these ideas more quickly. In particular, new growth theories have been used to justify intervention to encourage investment, especially investment in R&D and education and training.

Both the neo-classical and the new growth theory approaches contrast with the neo-Schumpeterian approach which emphasises the cumulative nature of technological progress and the importance of accumulated knowledge passed on by word of mouth within institutions. Nelson and Winter (1982) suggested that corporate behaviour was often dominated by rules and routines learned within the corporate framework and passed on from one generation of managers to another. March and Olsen (1989) applied the same ideas to political institutions.

> "Political institutions are collections of inter-related rules and routines that define appropriate actions in terms of relations between roles and situations ....When individuals enter an institution they try to discover and are taught rules. When they encounter a new situation, they try to associate it with a situation which already exists." (March and Olsen, 1989, p160).

Institutions, therefore, whether corporate or governmental, are key players in the process of innovation, learning and knowledge accumulation. They act as the corporate memory, storing through rules and routines the knowledge (best practice) gained from experience by earlier

generations. Innovation requires testing new ideas and ways of doing things against existing best practice: only when the new is clearly superior to the old are rules and routines changed. North (1990), looking at the role of government, came up with the distinction between *institutions*, which embodied the legislative and administrative framework (eg, government departments, national banks, competition authorities) and *organisations*, which he defined as the *agents or players* in the system. Gregerson and Johnson (1997) extend this concept. Government institutions are the embodiment of the rules and routines laid down through a framework of legislation and administrative fiat: hence a tax incentive or subsidy, part of the policy framework, is embodied in law and may be seen as an 'institution', but so too are organisations such as research councils, set up as administrative agencies but often wielding wide discretion over the allocation of resources. The real distinction needs to be made between ministers and their advisers, who are the *players and agents of institutional change*, and the institutions themselves, established via legislation and embodying, in the process, rules and routines which are perceived to be best practice at the time when they are set up but which can be changed at the discretion of ministers.

*1.1.3 – National systems of innovation*

The national systems of innovation (Lundvall, 1992) approach to policy making is built upon these concepts of 'the new institutionalism'. Each country develops rules and routines and embodies them in institutions. These institutions vary from country to country reflecting both diversity of experience and also cultural preferences and prejudices. The set of institutions in any one country represents a 'system' or rather an overlapping set of systems one of which incorporates the institutions relating to innovation. Each national system is different in that it reflects national characteristics. Britain, for example, has a strong central government civil service machine developed over time since the famous Northcote-Trevelyan reforms of the mid-nineteenth century and which has, over time, come to have a dominant role within the economy. By contrast, the German system of strong regional (Länder) government and relatively weaker central (federal) government institutions created after World War II has helped create a different set of institutions with a much greater regional bias. British industry developed in the nineteenth century on the basis of limited liability and equity capital; German industry has traditionally been financed via bank capital.

There is no question of one system being right and another wrong. Each has developed, and been adapted, to suit different environments. They are different and they respond to new challenges in different ways. As a result each country also has its own policies that may be influenced by experience elsewhere but which reflect the institutions and their history within each country. The European Union is beginning to develop its own institutions. In this paper we shall be looking, for example, at developments in a number of areas – science and technology; regional policy and the Structural Funds; state aids and competition policy – but in historical terms these institutions are still young and, as we shall see, national institutions and national policies still play an important part in determining outcomes. An interesting issue, and a key focus of the studies presented in this paper, is the degree to which national policies are changing as a result of the emerging role of the EU as a policy maker.

From the institutionalist perspective, therefore, the role of government in policy making is a dual one. First, there is the role of institution building – important in relation to the CEECs because in may respects they are creating institutions, for example competition authorities, which have not existed before – and secondly there are the decisions of strategy as to how to use the institutions; what sort of competition policy to pursue; whether to introduce R&D

subsidies, etc. The process of accession to the EU has prompted much institution building in the CEECs, with each chapter of the *acquis* requiring its own set of institutions.

One of the lessons to be learned from the systems of innovation approach is not to be afraid of diversity. Institutions need to reflect differences in national approaches. They do not need to be uniform. Above all, if they are to work efficiently within the national context, they need to carry credibility with stakeholders who will be affected by them. It is therefore important to consult widely in setting up new institutions, consider the different 'models' on offer and tailor the institution to fit national requirements. Moreover, set them up recognising that they will perforce change over time as priorities and policies change. What is appropriate for 2002 may not be appropriate for 2010 and there is no shame in having to change and reshape institutions. Indeed, flexibility within reason is a virtue. Equally, institutions by their nature live by 'rule and regime' and can be de-stabilised by too many changes. It is arguable that institutions such as the National Health Service in the UK have been damaged in the last decade by being asked to assimilate too many changes in too many dimensions.

*1.2 – Topics covered in this paper*

This paper seeks to marry both the traditional and the institutionalist interpretations of industrial policy. Section 2 begins by examining the changing context of policy in the last quarter of the twentieth century, highlighting the growing interdependence of national systems of production and distribution as trade liberalisation, including that implicit in the development of the EU, combined with new modes of transport and communication, led to the emergence of what is now generally termed 'globalisation'. As we shall see, policy has evolved and adapted to this global context, but institutions remain predominantly national and it is this non-globalisation of institutions which gives continuing relevance to national policies embodied within national systems of innovation. It also raises interesting questions about the emergence of institutions at the EU level of government and their co-existence and co-operation with national institutions. Section 3 explores further the theme of globalisation, looking in detail at the issue of foreign direct investment (FDI). Case studies of the UK and Irish experience of FDI are used as a base on which to explore some of the lessons to be applied to the CEECs. Section 4 picks up the issue of competition policy, examining the development of Community policy towards restrictive practices, dominant firms and mergers and its inter-relationship with national policy in Germany, the UK and Italy. Section 5 looks in more detail at another aspect of competition policy, namely the evolution of state aids' policy, and examines the very powerful effect it has had on constraining handouts from national governments. Section 6 examines developments in regional policy and the Structural Funds, highlighting in particular the experience of Italy and Ireland, both substantial beneficiaries from the Structural Funds. Section 7 looks at science and technology policy and in particular the growing and accepted division of responsibilities between national and EU authorities. Section 8 attempts to pull the set of experiences together and to draw some general conclusions.

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# Section 2 – Integration and Globalisation[1]

## *2.1 – National champions, European players and global oligopoly*

Looking back over European integration during the period dating back to the late 1970s, it is apparent that the process of integration has been played out against a background of globalisation. The late 1970s were *par excellence* the age of the national champion. In France and Britain governments deliberately used not only industrial subsidies, but also (and perhaps even more flagrantly) public procurement in both government departments and nationalised industries to promote the interests of national firms. In Britain, ICL, then a British-owned computer company, was awarded large public sector contracts; GEC-Marconi, Britain's dominant player in the electronics field, was awarded substantial contracts in defence electronics with the aim of helping promote its activities in the consumer electronics field; British Telecom, still a nationalised concern, deliberately shared contracts out amongst the three British suppliers of telecom equipment (and excluded all foreign suppliers) to ensure a steady supply of work. In France, similarly, companies such as Honeywell-Bull, Thomson and Alcatel worked closely with the DGT (France Telecom's predecessor) to promote a French presence throughout the electronics pipeline (then called the filière éléctronique). Even in Germany, Deutsches Bundespost looked naturally to companies such as Siemens and Nixdorf as suppliers.

The 1980s brought the first shakeout amongst the national champions, stimulated in part by the deregulation and break up of AT&T in the US, which unleashed the world's largest telecoms company to operate in overseas markets. (Under the 1920's anti-trust agreement with AT&T the company had been restricted from operating outside the US and its overseas arm, ITT, had been separated from the parent company.) Fear of US and Japanese entry into the telecoms market, combined with the privatisation of British Telecom and a tougher stance on the part of the Commission towards state aids and overt favouritism in public procurement, as well as rapid technological change in all markets associated with electronics, brought the first casualties – ICL was taken over by Fujitsu; Plessey, another British player, was taken over by GEC; Nixdorf was swallowed up by Siemens; and Thomson took over Telefunken and, subsequently, the British firms Thorn-EMI and Ferguson. The demise of ITT in 1987 led to further reordering of roles and the rise, in telecoms, of Alcatel, and in consumer electronics, of Nokia, as major European players. In other areas, GEC linked up with Alsthom and Asea with Brown Boveri to form two major European players in heavy electrical plant and machinery; Philips and Siemens joined forces in the 'mega-project' to develop new generations of semi-conductors; and Ericsson emerged as the leading player in the new world of mobile communications. By the end of the 1980s, the national champions of the early part of the decade had merged, frequently across national boundaries, to become European companies, with their base firmly in European markets but increasingly competing, and holding their own, in those markets with US and Japanese multinationals. This trend towards 'Europeanisation' was further reinforced by moves towards the single market, which gave further impetus to deregulation and opening up markets, including public procurement, to competition across all member states.

[1] This chapter takes its general line from the cross-cutting study on globalisation in the TSER project. See Sigurdson (2000): The Globalisation of Science and Technology: An attempt to identify the effects on Nations, EU, and their Policy Responses.

The 1990s saw a further wave of mergers in the aftermath of the completion of the single market in 1992 and, perhaps more significant, in the wake of the deep recession which followed the boom years of the late 1980s and the euphoria at the demise of the Soviet the empire and re-unification of East and West Germany. On this occasion, the mergers crossed not only national boundaries but also continental boundaries. Saab, the Swedish car company, fell to General Motors; Jaguar (Britain) went to Ford; Volvo to Renault. Beecham's, the British pharmaceutical company, merged with Smith-Kline (US) to form Smith-Kline Beecham, and then again with Glaxo-Wellcome (US) to form Glaxo-Smith-Kline. Pharmacia, the Swedish pharmaceutical group, merged with UpJohn and shifted headquarters to London. BT, the privatised British telecoms groups, bought the US long distance telecom provider, Sprint – a purchase it was subsequently to regret – and throughout the ICT sector marriages of one sort or another were being done and undone on a regular basis. The outcome created, in effect, global oligopoly. Whereas, in the 1960s and 1970s, the pervasive industrial structure had been national oligopoly with four or five large firms dominating national markets, in the 1980s this had become, in Europe, European oligopoly as markets opened but mergers and acquisitions took their toll, and by the 1990s the process became global. In some sectors there was a distinct shift towards a narrower focus of operation. Thus, for example, in the chemicals sector, whereas in the 1980s there had been some 20 (conglomerate chemical) firms world wide supplying, say, polyurethane, by the end of the 1990s, through the processes of merger, divestment and acquisition, there was a choice of only three or four.

### *2.2 – Changing management systems – the lean and mean corporation*

The wave of mergers and acquisitions in the 1990s brought a dramatic shift in the control of companies, away from country (and often family) based management systems towards international businesses run by professional managers and institutional investors and driven by economics, not sentiment. The 1980s MNCs had retained their distinct national characteristics. Whereas production operations had been switched overseas to low cost locations, headquarters and R&D had remained usually nationally based and the companies could legitimately be called British, French, Swedish or German-based MNCs. In the 1990s all this began to change. The search for economy led to the outsourcing of operations and downsizing of central functions. The companies became in effect holding companies whose main function was to organise and manage an increasingly complex set of sub-contractors as operations even as central as R&D were outsourced to specialists. This type of company became known as the 'hollow' or 'lean and mean' company: highly competitive, and searching constantly for both new ideas and new markets.

The shifting of labour-intensive production operations to low cost locations in fact began in the 1970s and provided the springboard from which the Asian tiger economies had taken off. The pattern was by the 1990s well established. As real wages rose and prosperity increased, so the basis of production in these countries moved to higher value added activities and the labour intensive activities shifted to the next wave of industrialising countries. In Europe, the low exchange rates and very low real wages of the countries of the former Soviet bloc in the aftermath of 1989 likewise brought MNC investments. And as in Asia, as real wages rise, so these investments are liable to be 'moved on' to other, lower cost locations. But the rise of the 'lean and mean' corporation has created new challenges:

(a) *FDI is fickle* – in particular it is liable to disappear once real wages begin to rise. The only way to retain it in the long run is to be able to offer specialist services at competitive rates. For example, the quality of science, and particularly biology,

education in Britain played a substantial role in attracting pharmaceutical R&D from foreign companies to the UK and this in turn has played a major role in helping build a highly successful pharmaceutical industry in that country.

(b) *SMEs are important* – with increased outsourcing they are now the main players in the supply chains for MNCs, but they have to be able to meet stringent quality control/just in time requirements of MNCs, which means being on top of technologies employed. For an economy to remain competitive in this world of 'lean and mean' but highly competitive MNCs it is vital that its SMEs are on top of innovation. Hence education and training and R&D become important issues of policy;

(c) *SMEs are also the main hope for the future* – the key issue for long term sustainable growth is whether indigenous firms begin to emerge beyond the MNC ambit with the potential themselves to become the MNCs of the future. Less than one percent of SMEs actually fall into the category of new technology based firms (NTBFs) but it is important to encourage and nourish such enterprises so that they can become the Microsoft or Hewlett Packard of the future. It is worth remembering that both firms emerged from early beginnings as garage-based enterprises, as indeed in earlier generations did car companies such as the British Morris (now Rover) or the French Peugeot;

(d) *Competition policy is important* – where there are relatively few 'world players' competing for new markets, it is important not to allow seemingly big players to dominate markets to the detriment of consumers and/or employees. And as the Enron saga in the US illustrates, it is also important to make sure that enterprises, however big, adhere to the regulatory frameworks established to ensure fair play.

### *2.3 – Policy has in fact been adapting to developments in globalisation*

An overview of industrial policy developments in six EU countries (German, France, The UK, Italy, Sweden and Ireland) over the last 25 years undertaken as one of the research projects for the Fourth Framework programme (Sharp, 2000, 2001) identified a number of clear trends in policy common to all countries and which, in retrospect, can be seen to be the adaptation of policy to meet the demands of the globalising learning economy that has emerged. These trends can be summarised as follows:

(a) *from intervention to laissez faire* – in the late 1970s, all mature economies in Western Europe were embroiled in a welter of subsidies, mainly targeted to maintaining a national presence of firms in the 'sunset' industries such as steel, shipbuilding, textiles and clothing, but also comprising some of the new, but labour intensive 'assembly' sectors in consumer and business electronics, and engineering sectors such as cars, bicycles and motor bicycles. These sectors had been hit by the sharp recession after the oil crises of the 1970s and the simultaneous beginnings of the 'globalisation' movement with the shifting of labour intensive activities to the 'tiger' economies of SE Asia (then called newly industrialising countries or NICs). Governments had been fazed by the depth of the crisis and the sharp rise in unemployment and had responded by pouring in money to save jobs in much the same way as governments had responded with protectionism in the 1930s. In the 1970s the presence of GATT, OECD and not least the EU had limited overt protectionism, but the subsidies constituted substantial non-tariff barriers to trade and grew in similar 'beggar my neighbour' fashion as each escalation was justified by what others were doing. Two factors prevented the situation from getting out of hand. First, a shift across Europe to right wing governments, epitomised by Mrs Thatcher in Britain and President Kohl in

Germany, wedded to cutting subsidies and containing public expenditures; secondly, common accord amongst EU (then EEC) and other European leaders that the escalation of subsidies was self destructive and the institution of negotiations to rein them back. The latter proved to be the beginnings of the EU state aids regime which has since played an important part in curtailing (and preventing any resurgence of) the subsidy regime. The overall result is that, whereas in the early 1980s countries such as the UK and France were devoting some 4 per cent of manufacturing value added to subsidies (with Italy close to 10 per cent) by the late 1990s this was down to about 1 per cent (and even Italy had managed to bring spending down to 4 per cent).

(b) *from support for large firms to support for SMEs* – as already mentioned, state aid in the 1970s went disproportionately to large firms in areas such as shipbuilding, steel production, cars and consumer electronics. If the value of other measures – public and defence procurement, the multi-fibre agreement and other informal agreements with Asian producers to limit exports – were taken into account, it was again the large firms that benefited. By the late 1980s this had begun to change, although Europe's large firms continue to this day to wield substantial influence over governments. For many of these firms, however, competing and facing intense competition in their home markets from other global players, home markets became less important than overall competitiveness. They, like other global players, could and did shift labour intensive production overseas and could choose their management from a global pool of talent. If they were to retain links with their home base what they wanted from government were policies which promoted economic stability, especially in exchange rates, limited taxation and created a well-trained and motivated work-force. For governments, faced by an increasingly footloose global players, the key issue became that of attracting and retaining high value added jobs. Fostering efficient and competitive SMEs which could attract and retain their position in MNC supply chains was an important element in this strategy. The shift in focus – from large firms to SMEs – can therefore be seen as a part of a natural process of policy adaptation to developments in globalisation. What is less understandable is the fact that policy focused disproportionately on the one per cent of SMEs that were NTBFs, with emphasis especially on academic linkages and venture capital. This derived perhaps from the over-hyping in the US of the exploits of new firms in micro-electronics and biotechnology. In the late 1980s every European government wanted to 'grow' such entrepreneurial small firms, neglecting the importance of improving the performance of the ordinary run of SMEs. By the late 1990s, the balance had begun to swing back, but still much attention (arguably too much) was paid to the needs of high tech small firms in contrast to those of the 'ordinary' SME.

(c) *from national policy to regional policy* – the shift of policy from intervention to laissez faire and from large to small firm has also, perhaps understandably, seen a shift of focus from national policies dominated by national governments to regional and local policies run by lower tiers of government. We say 'perhaps understandably' advisably. The shift in focus from large firms to SMEs might be seen naturally to entail a shift to locally based policy because only at the local level can the position of the SME be well understood and catered for. In those regions which have seen the dynamic growth of SME involvement – for example in Baden-Würtemburg region in Germany – the regional (Länder) government has taken a lead in developing local support networks, mobilising technical expertise from the universities and technical colleges, working together with the banks and venture capitalists to develop financial packages, and generally looking to their interests. This contrasts with a country such as the UK where SME policy has remained (except in Scotland and Wales) the

province of central government, albeit through the regional offices of central government, but which has signally failed to mirror the 'bottom-up' dynamic seen elsewhere. In general, given the importance of local support networks in the innovation process, top down policies are likely to be less efficient than locally based policies geared to the specific needs of the individual enterprise. Perhaps it is the dominance of top-down policies that explains the emphasis on the NTBFs – too many bureaucrats still implicitly work with the linear model and think that all that is needed to promote innovation is to provide a science park (an intermediary between science and industry) next to the university campus!

(d) *from mission oriented to diffusion oriented* – a further characteristic of policy in the late 1970s and early 1980s was that much was mission oriented. This phrase derived from a policy critique written by Henry Ergas (1983) which criticised British and French policy for concentrating resources on major innovative projects – for example building nuclear power stations or developing an early warning radar system – rather than, as in (then) West Germany, where resources were spread more thinly and in ways that diffused more broadly throughout the country, as for example through the emphasis on education and training and improving the quality of the work-force. The wisdom of his analysis hit home when it was written, but has become the more relevant with globalisation. The need to concentrate on up-grading broad capabilities rather than rely on the 'trickle down' effect of one or two major projects has become increasingly apparent. Equally, it is important to recognise that France, in particular, has succeeded in using the 'grand programme' approach highly successfully in such areas as the TGV (high speed trains) to give its firms a significant lead along the learning curve of a new technology. Mission oriented programmes may have some place still in the panoply of policy.

(e) *from physical capital to human capital* – post-Keynesian concern with investment as the key generator of growth led to a post-war inheritance of policy biased towards the development of physical capital. Capital expenditure could not only be written off as expenditure against tax but often benefited from additional weighting – in effect adding a subsidy to the normal tax write-off. Other governments offered direct subsidies either in the form of grants or by offering soft loans at below market interest rates. Even when the aim was, as with regional grants, to create jobs, the incentive was towards capital expenditure – which reached its apogee when the oil companies exploiting North Sea oil reserves in UK waters received huge subsidies to build the capital-intensive but near automatic (ie, employing very few operatives) oil terminals along the east coast of the UK. In similar fashion, many of the chemical plants of the Mezzogiorno in Italy, built to create jobs for the South, provided very few jobs but huge subsidies for the oil/chemical companies, their owners. By the early 1980s, the ineffectiveness of such policies became clear. Jobs were scarce and public expenditure no longer the favoured vehicle for creating new jobs. Cost-effectiveness was the name of the game. It was not until the 1990s, however, that the implications of globalisation made themselves felt. Robert Reich, in his seminal book *The Work of Nations* (1992), pointed to the international ownership of capital and argued forcibly that while capital and technology may be footloose, labour is not and that the quality of the labour force was the key factor in creating the wealth of nations. High quality, well-paid jobs went with a high quality, highly skilled work force and whether those jobs came from the subsidiary of an MNC or from a locally based company was largely irrelevant. Both were vulnerable to international competition and what in the long run would give them their competitive edge was not low labour costs – with the Third World rapidly industrialising it was impossible for countries such as Britain or

the US to aim to compete on labour costs – but an educated and skilled workforce which could not be found elsewhere. By the mid-1990s the lesson was well learnt. Education and training to 'enhance human capital' has become the focus of activity, with words such as 'capacity building' (building up capabilities) and 'absorptive capacity' (the degree to which an economy has the ability to make good use of a skill or technique) creeping into the jargon. The latter disguises an important concept. It is of little use, for example, pouring resources into new technologies if there are insufficient people in the country with the training or knowledge to make use of them. Better to put the resources into setting up laboratories and post-graduate training facilities which mean that next time around there are people who are in a position to exploit the new ideas. Leading edge technologies cannot be just bought off the shelf and put to immediate use – they require people knowledgeable in such techniques (receptor points) to exploit them. Establishing programmes of basic science and training post-graduate scientists in modern techniques is as much part of a programme of capacity building as is training civil servants. Nevertheless, while human capital is important, investment in physical capital, especially plant and machinery, remains vital, for new investment brings with it new generations of technology. While a switch of emphasis from physical to human capital was appropriate, the two are complementary.

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# Section 3 -Foreign Direct Investment

## *3.1 – Foreign Direct Investment and industrial networks*

The project to which this paper contributes – the emerging industrial architecture of the wider Europe – has put much emphasis on the role of foreign direct investment (FDI) in the CEECs both as a source of capital and, more importantly, as a vehicle for reconstruction and regeneration. In the process the industrial networks generated by the firms themselves play an important part since benefit derives not only from the jobs and exports created but also from the stimulus provided to indigenous enterprise through sub-contracting chains, quality control systems and management training. In addition, the project has highlighted the fact that successful outcomes from FDI (in terms of reconstruction and regeneration) depend also upon the building of complementary sets of networks linking MNCs not just to their local suppliers but more widely into the public and private systems that form the industrial base of the country. In most of the studies to date within the project, evidence has been taken from the emerging experience in the CEECs themselves. Here we turn the tables and look instead at the experience over the last 25 years of two of countries in Western Europe – the UK and Ireland – which have deliberately sought to use FDI as a tool of industrial policy. What are the lessons to be learned from their experience and what support, if any, do they provide for the suggestion that successful outcomes require the development of an inter-linking set of networks, integrating public and private sector?

## *3.2 – The experience of the UK*

### *3.2.1 Early experience*

The UK's experience of FDI is interesting because it now dates back over 100 years to the early days of American and German and Dutch multinationals at the end of the 19$^{th}$ century. The high tariffs of the inter-war years forced companies such as Ford and General Motors to build large production plants in the UK, and American multinationals became the dominant players during the period of post-war reconstruction when protection and high tariff walls were rife, currencies were not convertible and the dollar was in short supply. In these circumstances, Britain and other western European countries were anxious to attract American MNC investments both as an import-saving measure and in order to develop export-based industries. For their part such investments often provided the only way the MNCs could avoid punitive tariffs and enter Western European markets. Britain proved an attractive location offering access to a large market starved of consumer goods as well as tax breaks and capital subsidies to such investments. The English language was also a considerable advantage and the fact that many Americans had had experience serving in Britain during the war. Moreover, Britain already hosted a number of large US corporations such as Ford and GM which had established successful subsidiaries during the protectionist era of the 1930s and were now household names and regarded in many respects as British firms – GM for example used the name of the British car manufacturer, Vauxhall, and few realised it was actually an American company.

In such a climate many American companies set up subsidiaries, which were often initially little more than distribution units making up products imported in kit form (thus avoiding the high tariffs imposed on finished goods) but which rapidly expanded, taking advantage of the capital subsidies on offer, to locally-based manufacturing units sourcing at least some of their needs from local suppliers. Some of these companies departed as tariff protection was dismantled and competition increased in the 1960s, but many had by that stage become

reasonably 'embedded' in the local economy, employing British managers and using Britain as a base for sales not just to UK markets but to the Commonwealth and, increasingly, to Europe. The prospect of entry into the (then) EEC made Britain an attractive 'staging post' for access to that market. By the early 1970s, when Britain did eventually enter the EEC, approximately half the FDI registered as coming into Britain in fact came from the re-investment of profits from existing subsidiaries (Brech and Sharp, 1984).

*3.2.2 – The pharmaceutical industry – the great success story*

The pharmaceutical industry is an excellent example of the role played by FDI in Britain. Many foreign (predominantly American, but also Swiss and German) firms set up subsidiaries in the 1950s, initially making up their products from imported intermediates but subsequently establishing, first, production facilities and then R&D. The latter was encouraged in the 1960s by the adoption of a price regulation regime for the National Health Service which gave preference (in the sense of allowing the charging of higher prices) not to British firms but to firms which had fully fledged R&D facilities in Britain. These facilities were run and managed by British people but as subsidiaries to an international enterprise. The strength of the British science base, especially in molecular biology, undoubtedly helped attract such facilities but the outcome was to train a generation of British managers, many with a science background having been originally recruited as research scientists. These people went on to provide a cadre of managers in both their own firms and in British firms such as ICI, Glaxo and Beechams who in the 1970s and 1980s helped transform them into what are now highly successful international groupings. In this respect, FDI not only provided role models and opportunities for management training but also the competitive stimulus to British groupings to raise their game to international levels. Companies such as Glaxo and ICI Pharmaceuticals (now Zeneca) had to compete in their home market with leading international players such as Merck and Pfizer. For their part, companies such as Pfizer, which originally came to Britain in the 1950s, had by the 1980s built up considerable investments which had become highly lucrative. By the late 1990s, four of Pfizer's top selling drugs, including Viagra, derived from research undertaken in their UK laboratories and they were in the process of investing a further $4bn in their Folkestone base.

*3.2.3 – The Thatcher years*

The Thatcher government of the 1980s continued the practice of welcoming FDI – indeed they were almost mercantilist in approach, actively seeking out possible new entrants and proudly announcing new deals. At that time, Japanese and South Korean firms were beginning to use FDI to circumvent the voluntary export restraints imposed to protect European firms from competition, especially in consumer electronic products and motor cars. Rather than fearing loss of jobs to indigenous companies, the Thatcher government set out to woo such firms, arguing that competition was healthy and that Japanese firms in particular, with their strong emphasis to skill training and quality control, provided good role models for their British counterparts (NEDC, 1982). Moreover, in spite of their aversion to subsidy, they continued to use the promise of substantial one-off regional grants as a means of attracting such investments. In the early 1980s Nissan attracted a grant of £112m (€180m) when it established its plant in North East England; Toyota received £75m (€120m) towards its plant at Derby (House of Commons, 1990). In the 1990s, Ford received an aid package of some £80m (€128m) when it set up its new engine plant at Bridgend in South Wales, an area that had seen much disinvestment in steel and coal, and Lucky Goldstar, the Korean semi-conductor firm was rumoured to have been offered grants totalling £248m (€396m) for its planned (but never built) plant at Newport, South Wales (House of Commons, 1998) By 1997 the cumulative value of FDI in Britain was just under £160bn (€256bn), the annual flow

approximately £20bn (€32bn) and annual earnings some £13bn (€20bn). In spite of the attempt to attract Asian capital, over 50 per cent of these investments came from the US and much of the remainder from Europe – testimony to the importance of retained earnings to cumulative totals (UK Office of National Statistics, 1998). The cumulative impact of this investment is told in another set of statistics. By 1997 foreign owned companies in Britain contributed 40 per cent to manufacturing exports, 30 per cent to manufacturing investment, and 20 per cent to manufacturing employment. Of the top 100 spenders on R&D, 24 were foreign subsidiaries, and over 20 per cent of funds spent on R&D came from foreign sources (DTI, 1997, 1999).

*3.2.4 – Long term wider impacts*

A study of the wider effects of this investment on the UK economy revealed not only the very substantial contribution foreign companies made directly to the UK economy, but also sought to measure the indirect benefits (PA Cambridge Consultancy, 1995). The study estimated that for every 100 direct jobs created an average of 26.8 indirect jobs were generated. The main impact however came in terms of improving the quality of labour (enhanced skills and higher standards of training); increasing the quantity of labour (bringing young people and women into the labour force); encouraging the provision of business support services; raising the image and visibility of their locations (as a major employer in a disadvantaged location the firm gave the area status in the regional and national setting); and in upgrading the technological base (attracting good quality scientists and engineers to work in the area) (*op cit* pp140-142). The report found a good deal of co-operation with local agencies, especially the training agencies, whereas the research linkages with universities tended to be not with local universities but at national level (*op cit* pp149-153).

The report also made clear that the major factor underlying most firms' location decisions was the desire to strengthen a market position and capture new markets. Seventy per cent of firms listed capturing new markets as 'a very important reason' for their location decision; 53 per cent listed the availability of the site; 33 per cent the availability of labour and (significantly) only 20 per cent listing the cost of labour. The UK was seen as an important gateway to the bigger EU market – a factor noted by over 50 per cent of firms surveyed (*op cit* pp 145-146).

*3.2.5 – General conclusions on the UK experience*

To sum up, for the whole of the period under consideration (1975-1995) and earlier, British governments have encouraged inward investment. In the early years the prime motivation was jobs, foreign companies being perceived to be more footloose in location decisions than their local counterparts and more open to monetary incentives. By the 1980s, when voluntary export restraints were operating in a number of sensitive areas and many foreign firms were using FDI to tariff jump, companies were welcomed not just for the jobs they created (indeed it was recognised that indigenous jobs were often lost in the process) but for their perceived impact on competition, quality control and management standards. The combined impact of cheap labour, positive welcome, the English language and the growing integration of the European market, made Britain an attractive staging post for location of European subsidiaries. For their part the companies contributed substantively to the UK's production capabilities both directly in terms of investment and jobs and indirectly in terms of training, management practice and R&D.

For the most part they have embedded themselves into the British economy as global players. Only occasionally, when for example the going gets rough and firms such as National

Semiconductor (original investment in Scotland in 1978) or BMW (bought Rover cars in 1992) pull out, is it necessary to recognise that for these firms, home is another country.

### *3.3 – Ireland*

#### *3.3.1 – The tiger economy of Europe?*

In relation to its GDP, Ireland attracts more FDI than any other current member of the EU. The UK may pride itself on attracting inflows each year of some €32bn, but as a proportion of GDP such sums are relatively small whereas for Ireland the inflow of investments it attracted over the period 1986-1995 amounted to over 5 per cent of GDP (CEC, 1999). By the late 1990s, it was capturing over 10 per cent of all US investment to the EU. Over 50 per cent of those employed in manufacturing (itself by 1995 a healthy 30 per cent) were employed by foreign enterprises. Foreign firms accounted for two thirds of industrial output in Ireland and three quarters of industrial exports (CIRCA, 2000). What is more, Ireland has been the most successful and fastest growing of the EU economies, experiencing growth rates in the late 1990s of over 6 per cent. Much of this success is attributed to its strategy of encouraging large inflows of FDI into manufacturing industry and promoting export led growth along lines similar to the Asian tigers (Sachs, 1997). Behind this seemingly simple formula lies, however, a rather more complex reality.

#### *3.3.2 – Learning the lessons the hard way*

In the first place, Ireland learned the hard way to be discriminating about its capital inflows. In the 1950s and 1960s it followed the UK in putting import substitution high on its list of priorities and welcoming more or less any foreign company that would locate in Ireland. Substantial public resources went on offering generous tax allowances and capital grants, but the firms attracted were also quick to depart once the going got tougher in the oil crisis recessions of the 1970s. For all its substantial investments, the Irish Development Authority (IDA) which had master minded the programme, was left with very little by the end of the 1970s. A series of reports, the most influential of which was the Telesis Report of 1982 commissioned by the Irish government from the Boston Consulting Group, pointed to the very low levels of scientific and technological activity in Ireland, with the foreign implants attracted only by low labour costs and contributing nothing to improving capabilities. (Full details of developments in Ireland are given in the TSER country study on that country (Higgins, 1999). The descriptions given in this and subsequent paragraphs are all taken from this study.)

From the 1980s onwards a much more selective approach was adopted, with the (still substantial) subsidies and grants going to firms bringing not just investment and jobs but jobs that carried training and workforce improvement, and promises also to recruit and train local managerial talent. Simultaneously the Irish government embarked on a programme of expanding educational provision, with emphasis both on all round educational opportunities but particularly upgrading science teaching in schools and universities. The Irish universities were encouraged to play an active role in the EU's (then newly established) Framework Programme in order to expand research capabilities. At the same time it embarked upon a restructuring of technical and vocational education working closely with employers, both individually and through the chambers of commerce, the aim being to plan to meet skill needs as they arose. Increasing emphasis was also put on expanding indigenous industrial capabilities with the IDA relegated to dealing with FDI, while two new agencies were established, Forbairt to look to the promotion of indigenous firms and Forfas to promote science and technology.

*3.3.3 – The importance of the Structural Funds*

The reform of the Structural Funds in 1988 gave further impetus to these developments. Notably, it required recipient countries to develop an overarching 'Operational Plan' for the use of the funds. Ireland, unlike other recipients gave high priority to using the funds to invest in human capital, in particular to improving vocational and professional training and to expanding research capabilities. The reform gave impetus to the establishment of the Programme in Advanced Technologies (PATs) which identified three areas for priority spending – electronics, biotechnology and environmental issues – and established centres for research on university campuses (but not under university management) aimed both at technology transfer and at enhancing university capabilities. While the PATs centres funded laboratories and equipment on site, the aim was that they should become self-sustaining, using these resources as a mechanism for securing contracts from industry and government, including the European Commission. The expansion of the Framework Programme in the early 1990s provided an important means of linking these developments into high quality international science and technology, while the continued success of the inward investment policies complemented these developments by bringing to Ireland some of the leading MNCs in electronics hardware and software, chemicals and pharmaceuticals.

*3.3.4 – From FDI to growing their own jobs*

Recent studies have found the quality of FDI in Ireland to be comparatively high (Amin and Tomany, 1998). Foreign plants occupied a relatively strategic position in the division of labour, drawing on local labour resources not only for operatives but also for senior personnel. The noticeable improvements in the quality of FDI were in part attributed to the 'after care' services and finance available to upgrade investments. The least embedded plants were the most recent arrivals which tend to be in the high tech sectors, especially electronics and it is this sector which has suffered most recently from the bursting of the 'dot com' bubble in the US. Perhaps the most impressive feature of developments has been the growth in indigenous jobs. Forty per cent of the jobs created between 1994 and 1999 were in indigenous firms and the growth of the industrial base in Ireland since 1987 has been faster than at any other time in its history (Irish Times, 17 May 2000). It is also worth noting that Ireland now boasts a higher proportion of scientists and engineers per 1000 of population in the 19-25 age group than any other country in the EU.

### *3.4 – Lessons to be learned from British and Irish experience*

Both the British and the Irish pursuit of inward investment over the last two decades has been successful. Both countries share the advantage of being English speaking and acting as a staging post for access to EU markets. As the focus of the EU shifts towards the CEECs and fluency in English becomes increasingly common, neither advantage will last for ever. Britain benefits from the fact that much of the current inflow derives from the re-investment of profits from plants long located in that country. Although developments in the global economy have broken old links and led to a considerable re-shuffling of assets among MNCs, this degree of 'embeddedness' remains a major asset, bringing, as it does, higher value added investments and jobs at senior levels. Nevertheless, Britain trades on its position as a low cost economy within the EU, offering relatively low wage levels, low corporate tax rates and greater labour market flexibility than most of its competitors. This makes it vulnerable to opportunism of the 'lean and mean' approach of the modern MNC – here today and gone tomorrow. The quality of its science base has been a source of attraction, especially to the biotechnology and pharmaceutical industries, but the lack of investment in the science base in the last two decades of the 20$^{th}$ century, combined with substantial improvements elsewhere

(eg, Ireland), raise fears that this advantage will not last much longer. In addition, the general failure of the UK to invest over many years in technical and vocational education means a dearth of intermediate level skills. Above all Britain's refusal so far to join the Euro-zone makes it particularly vulnerable to the accession of new members amongst the CEECs where labour costs are still well below British levels. Indeed, there has been a sharp drop in FDI to the UK since the year 2000.

Ireland's legacy from earlier generations of MNC investment is much lower than Britain's but as noted, FDI as a proportion of GDP is now the highest in the EU. Ireland's achievement has been to transform its relatively poor agrarian economy into an industrial economy with a strong base in new technologies. FDI has been the basis of this transformation. Ireland retains still its low cost base, although real wages, especially in the Dublin area are rapidly catching up with the rest of Europe and the Irish government's policy of investing in human capital and being selective over inward investment limits (but does not eliminate) its vulnerability to opportunistic investments.

Its decision to enter the single currency and the UK's continuing vacillation on this issue can only be to Ireland's advantage.

What then are the lessons to be learned by the CEECs from the experience of these two countries?

1. *Subsidies and tax breaks*, within the limits allowed by the EU's state aids policies, can help to attract FDI but should be used selectively. As stressed earlier, in today's global economy, FDI can be fickle and opportunistic. Benefit derives especially from investments that are likely to remain long term, bring further investment and jobs at middle and senior management level, 'embedding' themselves in the economy.
2. *Be positive and pro-active* in the search for FDI. Both Ireland and the UK (and perhaps more particularly the different regions of the UK) have actively sold their advantages to prospective investors. Given intense competition for potential investments, it helps to make your own case as positively as possible.
3. *Ensure that there is complementary investment in human capital and infrastructure.* In particular, pay attention to the general quality of education, not just elite educational structures. While university training and research capabilities in science and technology are an essential to attracting high tech jobs, good basic training in intermediate level vocational and technical skills are important in attracting large scale investments bringing a substantial number of jobs. Management training is also useful and helps foster a cadre of managers capable of (and anxious to) run their own businesses. Equally, do not neglect investment in infrastructure – ICT, science laboratories and good train services are important complementary assets for the efficient use of human capital.
4. *Have a clear vision of priorities*. Whether it is a question of allocation of resources or selection of FDI opportunities, it helps to have a clear sense of priority and know the outcomes to be encouraged. In this respect the requirements of the Structural Funds and the identification of the Programme of Advanced Technologies gave Ireland a distinct advantage. In this regard, it is often easier for smaller countries or regions (Ireland is only 3.5 million people, smaller than most EU regions) to identify priorities than to reach agreement among a more diverse set of objectives – one of the reasons why the Structural Funds operate at regional rather than national levels.

5. *Governments can usefully help to promote supply chains and support networks for FDI.* MNCs will create for themselves the main networks (eg, supply chains) with which they will be involved, but 'embeddedness' requires deeper involvement with complementary support networks linking the firm into the corporate and public sector services. The policy of the Irish government in deliberately linking MNCs into, for example, local vocational education facilities, forced participation in these areas and led to their building wider links with the community. In the UK there was a notable difference between the situation in Scotland and Wales, where local regional development agencies took responsibility for forging such links, and the rest of England, where, until 1997, there were no regional development agencies and MNCs tended to be left to fend for themselves.

These conclusions tend to support the underlying thesis of this series of studies that successful outcomes from FDI are secured when the investment is linked into the economy by means of a complex of networks linking the firm not just into its own immediate supply system, but more widely into the public and private domains.

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Section 4 – Competition policy[2]

## 4.1 – The evolution of European competition policy

European competition policy has evolved incrementally through the widening and deepening of the policy's scope over the years since the first establishment of the EEC with the Treaty of Rome in 1957. From the early emphasis on restrictive practices in the 1950s and 1960s, to monopoly policy in the 1970s, and state aid and merger control in the 1980s and 1990s, the focus of policy has continued to expand into new industrial sectors. It has tended to use well established legal and administrative instruments while at the same time consolidating and extending the competition *acquis* through the accumulation of case law.

The foundations of European competition policy were laid down in the 1950s, first within Articles 65 and 66 of the European Coal and Steel Community (1951) and secondly and more importantly, under Article 3 (g) of the EEC (Rome) Treaty in 1957. Article 3 (g) seeks to guarantee that "competition in the internal market is not distorted." The competition provisions are given expression under articles 85 to 94[3] of the EEC Treaty and refer to restrictive practices, abuses of dominant position and state aids within the common market and which "affect trade between Member States."

The first regulation implementing Articles 85 and 86 of the EEC Treaty – Regulation No 17 of 1962 – set out the Commission's powers. Only recently have proposals been put forward to modernise these rules, including, amongst other things, replacing Regulation No 17 (see 2001 31st Report on Competition Policy). The European Commission remains the core EU competition policy institution. It has wide investigative powers. Firms or Member States which are the subject of a Commission decision may challenge the decision before the Court of First Instance and the Court of Justice in Luxembourg. The European Court of Justice, under Articles 172-7 of the Rome Treaty, has unlimited jurisdiction concerning decisions made by the Commission. The Court of First Instance was established in 1988 in order to assist with the competition cases.

From the 1950s onwards the emphasis had been on combating restrictive practices and the Commission attitude to monopoly policy proper (abuse of dominant position) was more ambivalent. No formal decision under Article 86[now 82] was made until 1971 and very few have been made since then. Of those that have been made, an increasing number have been subject to legal challenges. Cini and McGowan (1998) claim that the vagueness of definitions and the need for complex economic analyses, as well as fear of weakening industrial competitiveness, resulted in an ambivalent EU approach to monopolies. Moreover, it was only in the late 1980s that two other aspects of competition policy, namely merger control and state aids policy began to emerge as important. As far as mergers were concerned, with the merger boom of the late 1980s, there was political and economic rationale for a renewed impetus towards the creation of a fully-fledged policy. As regards state aid, although there was a legislative framework within the EEC Treaty, there was a weak application of the state aid rules until they received new impetus under the push towards the single market in 1992. (See next section, Section 5, for a more detailed discussion of state aids legislation.)

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[2] I am indebted to Anna Gwiazda, graduate student in the Sussex European Institute, for the substantial part of this section of the report.

[3] Article 12 of the Treaty of Amsterdam, signed on 20 Oct. 1997 and in force on 1 May 1999, provides for the renumbering of the Articles of the EC Treaty. For the competition provisions renumbering is the following: Article 81 [ex 85], Article 82 [ex 86], Article 86 [ex 90], Article 87 [ex 92].

In this way what had been a largely reactive policy in the 1960s and 1970s became, over the course of the 1980s, much more activist (Cini and McGowan, 1998). Both external and internal reasons accounted for the emergence of this 'new' competition policy. The revitalisation of policy in the 1980s may be partly explained by the neo-liberal influence over policy thinking at this time. Pro-market or pro-competitive solutions to industrial crisis were fashionable. Moreover, the effect of single market programme on the development of the competition policy was unequivocal. As the 1985 White Paper, *Completing the Internal Market*, noted it was necessary to ensure that anti-competitive practices do not endanger new forms of local protectionism (Commission, 1985). In addition, first Peter Sutherland and subsequently Leon Brittan, provided dynamic leadership of DGIV, the Competition Directorate within the Commission, encouraging the growing of both legal powers and staff competence.

In the 1990s decentralisation and subsidiarity became crucial questions. The decision in February 1993 to decentralise and work more closely with national courts, was welcomed in the light of post-Maastricht commitment to subsidiarity. First, it reduced the backlog of pending cases. Second, it enabled the national authorities to become directly involved in European competition policy. Moreover, new developments such as the adoption of a single currency and the liberalisation of the network industries affected all aspects of competition policy. In this regard, there is the ongoing process of updating rules and procedures which is driven by the need to strengthen the enforcement of EC competition law throughout the European Union. This in turn requires a simplification of procedures, a more consistent approach to the analysis of cases, a greater involvement of national competition authorities and national courts in the application of EU competition law (30th Report on Competition Policy, 2000).

## 4.2 – The key areas of European policy: antitrust policy, monopoly and merger control and state aids[4]

### *4.2.1 – Restrictive agreements and concerted practices*

Article 81 [ex 85] of the EC Treaty prohibits agreements and concerted practices between firms which "may affect trade between the Member States and which have as their object or effect the prevention, restriction or distortion of competition within the common market." This ban applies both to horizontal and vertical agreements[5] and affects agreements: that fix prices directly or indirectly; that fix conditions of sale; that isolate market segments, such as those concerning price reductions or that seek to prohibit, restrict or, on the contrary, promote imports or exports; on production or delivery quotas; on investments, joint sales offices, market-sharing, or exclusive marketing: agreements leading to discrimination against other trading parties; on collective boycotting, or voluntary restraints (agreements not to engage in certain types of competitive behaviour).

Article 81(3) does, however, provide for the possibility of authorising agreements prohibited under Article 81(1). There are two routes through which exemption is possible: individual exemption and a block exemption. Some agreements are even excluded altogether from the Article 81(1) ban under the so-called *de minimis* rule which refers to agreements of minor

[4] The Commission's taxonomy, namely antitrust (comprising restrictive practices and monopolies), merger control and state aid, is used here. The next section, Section 5, looks in more detail at state aid policy.

[5] Horizontal agreements refer to the same stage of production, processing or marketing, vertical agreements refer to the firms operating at different stages of the economic and commercial process and not being in competition with one another.

importance. The rule was established by the European Court of Justice in 1969. In both prohibiting restrictive agreements and allowing for their exemption, the law gives DGIV officials scope to apply their policy flexibly, permitting each case to be dealt with on its own merit. The *de minimis* thresholds now stand at 10 per cent for agreements amongst competitors and 15 per cent for agreements between non-competitors.

Certain types of co-operation are considered to be acceptable under Article 81(3), such as agreements which contribute to improving production processes or helping in the distribution of goods, or to promoting technical or economic progress. These may include licensing agreements for technology transfer; specialisation and R&D agreements; franchise agreements; and agreements in the insurance sector. Two recent regulations (EC Numbers 2658/2000 and 2659/2000) extended exemption to certain specialised types of R&D agreements and established guidelines for restrictions on horizontal co-operation agreements. Regulation No 2790/1999 created a new block exemption for, with minor exemptions, vertical agreements and other concerted practices between two or more enterprises where the market share involved is no more than 30 per cent.

*4.2.2 - Abuse of a dominant position*

Prohibition of monopoly or dominant position is set out in Article 82 [ex 86] of the EC Treaty as follows: "any abuse by one or more undertakings of a dominant position within the common market or in a substantial part of it shall be prohibited as incompatible with the common market in so far as it may affect trade between the Member States." Article 82 prohibits undertakings in a dominant position in a given market from abusing this situation to the prejudice of third parties. Such abuse may consist, for instance, in limiting production, charging excessive prices, discriminatory or predatory pricing, tying sales, or other commercial practices not based on the principle of economic efficiency. Unlike Article 81 of the Treaty, Article 82 has no individual derogations or block exemptions.

In the absence of dominance, Article 82 does not apply. As a result, the Commission must prove the existence of a dominant position and that it has a negative impact on competition, consumer welfare, or market integration. The Commission must assess both the relevant market and market power. Before it can decide whether a firm holds a position of dominance, DG Competition has to define a relevant market. There are three dimensions to the Community's market analysis: the product market, the geographical market and the temporal market. Market power is measured as the position of the firm in both quantitative and qualitative terms in the relevant market. The concept of a dominant position was first defined in the *Sirena v Eda* case in 1971 as 'the ability or power to prevent effective competition in an important part of the market' (Case 40/70 [1971] ECR 49).

*4.2.3 – Merger control*

There was no merger control at a Community level until 1989. That year a Council Regulation (No 4064/89) was agreed which provided for regulation. Merger control was absent from the EEC Treaty mainly because in the 1950s it was considered that the objective of economic expansion promoted by the EEC Treaty would necessitate large concentrations of economic power. However, in the next decade the attitudes changed and industry demanded the creation of a 'level playing-field' between mergers and other forms of competition policy.

The Council Regulation on the control of concentrations between undertakings stipulates that "a concentration with a Community dimension which creates or strengthens a position as a

result of which effective competition in the common market or in a substantial part of it is significantly impeded is to be declared incompatible with the common market." A merger can create such a "concentration" when a firm acquires exclusive control of another firm, jointly controls it with another firm or when several firms take control of a firm or create a new one.

The Regulation No 4064/89 gives the Commission the power to examine mergers before they take place (*ex ante* rule). It originally stipulated that a concentration with a "Community dimension" existed where the aggregate worldwide turnover of the companies involved exceeded €5bn, and the EU-wide turnover of at least two of the companies exceeded €250m (unless both companies derive more than two-thirds of their EU-wide turnover within one member state). This was amended in 1997 to thresholds of €2bn for worldwide turnover and €100m for EU turnover (Council Regulation No 1310/97).

*4.2.4. - Public enterprises and liberalisation of the market*
Article 86 [ex 90] requires Member States to ensure that publicly owned industries (except energy, transport, water and communications which have a degree of immunity) abide by EU competition rules. Article 86(2) allows some derogations to the general rules of the Treaty. The Commission's liberalisation policy is based on Article 86(3) [ex 90(3)], which allows it to address appropriate directives or decisions to Member States. For instance, Directive 96/19/EC set 1 January 1998 as the date for the entry into force of free competition in the telecommunications market. Moreover, the Commission is pursuing a policy of liberalisation in respect of the production and distribution of gas and electricity, postal services, transport.

*4.2.5 – State Aids*
State Aid is regulated in Articles 87 to 89 [ex 92 to 94]. Public subsidies to industry that might affect free competition and trade between the member states are prohibited, unless the aid promotes the interests of the Union or specific sectoral or regional objectives. Article 87(2) and (3) provides for a number of exceptions, for example, when aid promotes the economic development of areas where the standard of living is low or where there is serious underemployment, or where the aid is to promote an important project of common European interest. Because of the importance of state aids policy to industrial policy, it is dealt with in detail in Section 5 below and only briefly in this section on competition policy.

## 4.2 - Domestic competition policies in the EU Member States: the cases of Germany, the UK and Italy

*4.3.1 – Convergence and divergence in domestic policies*
National competition rules apply in all cases where disputes involve markets within the boundaries of a single Member State. In contrast, the Community rules were designed to apply only to situations where the restriction or abuse had an appreciable effect on trade between the Member States. In merger cases, those transactions which satisfy threshold requirements fall within the exclusive jurisdiction of the Commission; others are subject to Member State controls.

National competition policy is shaped largely by domestic considerations, and especially historical traditions in relation to the role of the state and cultural attitudes towards industry. The competition policies in the EU Member States are good illustrations of this. The three case studies set out below of domestic competition policies in Germany, the UK and Italy show that there are elements of convergence towards EU competition law, but also that idiosyncratic differences also persist. These case studies are interesting because each

exemplifies a very different approach to competition policy at least in the initial stage. Germany had antitrust laws in the 1950s. German cartel policy strongly emphasised the economic rationale and a non-discretionary approach. In contrast, Italy another original founder member of the EU, had no domestic antitrust legislation until the beginning of the 1990s and its competition legislation draws heavily on EU competition law. The UK when joining the EU in 1973 had its antitrust laws which dated back to the 1950s. However, the British approach was in stark contrast to the German one: it allowed for far-reaching political and administrative discretion with 'public interest' used to justify decisions taken on non-competitive grounds.

In the 1990s there was a clear tendency towards convergence of national competition laws around Community norms, albeit at varying speeds in different Member States. The EU Member States has shaped their domestic competition policies on European competition policy. The process of 'quiet' harmonisation continues. This type of harmonisation is both informal and spontaneous because there has been no direct pressure from the Commission. The process of convergence of the Member States systems has, moreover, been occurring without employment of the traditional tool of a Community directive.

The reasons for convergence of national competition laws to Community law are many (see Laudati, 1998). First, convergence can be seen as the result of a broadening interpretation of Article 3g and 5 of the Treaty. Second, the process of integrating national economies has placed the Member States under ever increasing pressures to align their competition laws and policies with Community competition laws in order to create a level playing field for all their enterprises. Third, greater consistency of approach and coherence is welcomed by business firms, and enables competition authorities to co-operate more easily when dealing with the same firm. Fourth, conflicting legal consequences occur in the absence of convergence. Should conflict arise between the Community and domestic law, as the Court of Justice ruled in *Walt Wilhelm case*,[6] the principle that Community law takes precedence.

However, divergences persist. Domestic competition policies have been subject to different cultural, historical and socio-economic considerations. The sizeable degree of divergence and the distinctions in style and tone are clear. This becomes clear in the three case studies set out below.

*4.3.2 - Germany*

The original Act prohibiting restrictions of competition (Gesetz gegen Wettbewerbs-beschränkungen, hereafter GWB) was enacted in 1957 and was only concerned with restricting anti-competitive behaviour. West Germany's competition rules were in part response to US policy and in part the result of the influence of the ordo-liberal thinking which dominated post-war Germany and combined elements of classical liberalism and social democracy. The result has been a rather inflexible approach to competition policy in which the competition criterion is rarely challenged and the pragmatic public interest dimension, which characterises the UK and other systems, is almost entirely absent.

There have been several amendments of the GWB as a response to perceived shortcomings that became visible over the years. The control of concentrations (restrictive practices) became an objective in 1973, while the amendment of 1980 defined the concept of a dominant position. The latest version of the GWB became operational on 1 January 1999 (it

[6] *Wilhelm v. Bundeskartellammt, 1969 ECR*

is called the Act, hereafter). The revision completely reworked the merger control system, reduced the number of sectoral exemptions and introduced public procurement provisions into the Act. In general, the new law forbids all types of horizontal linkage that might limit competition, forbids the abuse of a dominant position, as defined by the GWB, and requires mergers above certain thresholds to be cleared in advance.

The wording of Article 1 of the GWB Act is quite close to that of Art 81(1) of the Treaty and adopts a prohibitive approach for horizontal agreements. Previously, the practice of a horizontal agreement had been outlawed. The German distinction between horizontal agreement and vertical agreements is continued. With respect to vertical agreements, the Act maintains the more relaxed approach which has characterised German law to date. In the absence of abusive behaviour, exclusivity agreements are generally valid, unless they are specifically prohibited by the cartel authorities (Article 16). An exemption clause (Article 7) on the lines of Article 81(3) was added but agreements that would contribute to 'promoting technical and economic progress' were excluded in order to avoid any 'public interest' considerations. Article 7 allows for exemptions if they facilitate the 'development, production, distribution, acquisition, return or disposal of goods and services' providing such agreements do not damage competition over-proportionally.

Article 19 of the Act transposes Art. 82 of the EU Treaty into the German law, prohibiting any abuse of a dominant position. While the previous law prohibited certain forms of discrimination, it did not contain a general prohibition clause. Indeed, sanctions only applied if administrative findings of abuse had been ignored by the undertakings in question. The stricter concept of the new law aimed to facilitate public enforcement, and more importantly, to trigger private actions, which until then could not be brought to court.

As regards mergers, the new Act ended the distinction between the *ex-ante* approach and *ex-post* controls. As in the European merger regime, a purely *ex ante* approach for mergers was established. Under Article 35(1) of the Act, pre-merger notification will be required if, in the last business year preceding the merger the combined aggregate turnover of all participating undertakings was more than DM 1,000 (€500) million and the domestic turnover of at least one participating undertakings was more than DM 50 (€25) million. These thresholds extend considerably the scope of pre-merger notification. Unlike the relevant thresholds of the EC Merger Regulation, the German thresholds are not of jurisdictional character. Mergers which either strengthen or establish market dominance are banned, except in cases where the merger improves the competitive position of the industry in other markets (Article 36(1)). Moreover, definitions were extended by introducing a broader concept of acquisition of control taking the wording from Articles 3(1) and (3) of the EC Merger Regulation.

The Bundeskartellamt (Cartel Office) is charged to proceed against all restraints of competition which have an effect in Germany. Among its particular tasks is responsibility to enforce the ban on cartels, exercise merger control and control abusive practices. The Bundeskartellamt is, however, only responsible for enforcing the ban on cartels and exercising the control over abusive practices if the restrictive effect on competition extends beyond the territory of one federal *Lan*d. If the effect is limited to a single *Land* only, the competition authority of that *Land* will proceed against the infringements of competition law. Merger control is, however, the sole responsibility of the Bundeskartellamt. It is also the competent authority for all tasks assigned to the Member States by the competition rules of the EC Treaty. And finally, based on its practical experience, the Bundeskartellamt comments on matters of competition policy and competition law.

*4.3.3 – The UK*

The British competition system was not, as in the US, shaped by a strong and populist anti-trust movement. In the early part of the 20th century, the British took a surprising benign view of cartels and concentrations. This view lasted through the interwar period when widespread acceptance of restrictive agreements was matched by a generally protectionist approach to industry. It pervaded also the early post-war era, although the first piece of anti-trust legislation – the Monopolies and Restrictive Practices Act of 1948 – marked the beginning of a gradual change of stance, culminating in the highly pro-competitive legislation of the 1990s.

The 1948 Act established the Monopolies Commission, an administrative tribunal which was to consider, in cases referred to it by the Minister, whether the benefits derived of size and large scale organisation outweighed the detriment caused by its monopoly power. Each case was considered on its merits and action, when suggested, was at the discretion of the Minister. A wide ranging enquiry by the Commission into the use of restrictive practices exposed the degree to which the British economy of the 1950s was riddled by uncompetitive practices. The response was the establishment, under the Restrictive Practices Act of 1956, of the Restrictive Practices Court and, under separate management, the Registrar of Restrictive Practices. For the first time in British legislation in this area there was an *a priori* assumption that restrictive trade practices were against the public interest. Even so, the legislation offered the opportunity to argue exceptions (gateways) which enabled such practices as retail price maintenance to remain widely practiced until the late 1960s (and maintained for books and pharmaceutical products until the 1990s). In general, however, the tough stance taken in the first few cases reviewed by the Restrictive Practices Court saw the rapid dismantling of most restrictive agreements. Additional legislation was introduced in the 1970s. The 1973 Fair Trading Act created the Office of Fair Trading, with the powers of the Registrar transferred to the Director General of Fair Trading, and the 1978 Restrictive Trade Practices Act extended those powers and tightened further the constraints on restrictive practices. But at all times legislation, on restrictive practices, mergers and monopoly (dominant position) allowed for a public interest 'let out' – judgement had to be made either by the court (in the case of restrictive practices) or the Minister (in the case of mergers and monopolies) as to whether any benefits stemming from the arrangements outweighed the detriment they caused.

In fact, in spite of their commitment to competition, successive Conservative administrations did nothing to tighten legislation further and it was not until 1998, 20 years after the 1978 Act that a new Competition Act brought far reaching changes. It was drafted expressly to achieve close conformity with the EC regime. The wording of Chapter I and Chapter II import the prohibitions of Articles 81 and 82 very closely. The provisions for parallel exemptions in the Act ensure that the EC block exemptions and individual exemptions granted by the European Commission have automatic effect under domestic legislation. Even where a particular agreement does not affect trade between Member States, it still enjoys the benefit of a parallel exemption if it satisfies the terms of a European block exemption. Last but not least, agreements notified to the European Commission, and cleared by them, automatically obtain provisional immunity from financial penalties under the national law, just as they do under EC law. The European Court of Justice (ECJ) cases, such as *Leur-Bloem* and *Bronner*, have established conclusively that references may be made to the ECJ on the interpretation of Articles 81 and 82 where a domestic court or tribunal is considering corresponding issues. The Competition Commission's appeal tribunals are expected to be eligible to use this Article 234 procedure as tribunals and this will, no doubt, be important in establishing precedents in future.

The Competition Act 1998 also established the Competition Commission as an independent public body which replaced the former Monopolies and Mergers Commission. The Commission has two distinct functions. On its reporting side, the Commission has taken on the former MMC role of carrying out inquiries into matters referred to it by the other UK competition authorities concerning monopolies, mergers and the economic regulation of public utility companies. For mergers, the current legislative system is based on three pillars: the public interest test, investigation by the Competition Commission (as of April 1999) and ultimate political decision-making by the Secretary of State. In addition, the Act established a new Appeal Tribunals to hear appeals against decisions of the Director General of Fair Trading and the Regulators of utilities in respect of anti -competitive agreements and abuse of a dominant position. Nevertheless, the new Act still gives some discretion to the Director General for Fair Trading, for example in the interpretation of what is an 'appreciable effect' which means that, in spite of close similarity between the two regimes, there remain important differences.

The 2002 Enterprise Act has brought sweeping changes in UK competition policy and, in particular, mergers control. The Competition Commission is to become an independent decision-maker in its own right and responsible for deciding, on the basis of new competition-based tests, issues such as whether there is a substantial lessening of competition (in the case of a merger reference) or whether any feature of a market prevents, restricts or distorts competition (in the case of a market reference). Ministers have now withdrawn from most competition decisions. Except where issues national security are concerned, all mergers decisions are to be taken by the Office of Fair Trading and the Competition Commission. Ministers may have a role (eg, in overriding major divestment recommendations through secondary legislation) but they will be required to register their interest, although they may do this at any stage of the inquiry, and for a short period after the report is published. Most significantly, the public interest test has been abolished and replaced by the new criterion of whether merger results in substantial lessening of competition. This will narrow but not eliminate the scope for advocacy on public interests grounds. The Act provides for more transparency in publishing guidance and requiring consultation. Finally, The Competition Commission decisions will be open to scrutiny and judicial review.

*4.3.4 – Italy*

Italy, for the first time in its history, enacted a competition law in 1990. The aim of the law was to enlarge the role of the market economy "protecting and guaranteeing the right of free enterprise." The role of the state in the Italian economy until the 1990s was substantial both in terms of public ownership of utilities and other state-owned companies. There was also very substantial regulation by the state in almost all industrial and service sectors. The competition law and the large programme of privatisation, implemented in the 1990s, were influenced in large part by Italy's membership of the European Union and the changes necessary to complete the single market and subsequently to prepare for membership of monetary union. They have led to very significant changes in the role of the state in that country and the framework of regulation for industry.

The 'Law in defence of competition and the Market' ('Norme sulla tutela della concorrenza e del mercato') of 10 October 1990 resembles very strictly the analogous European law (Articles 85 and 86 of the Treaty of Rome). Its structure is very similar to that of the European Union itself:

1. Article 2 of the Law (analogous to Article 85 [now 81] of the Treaty) refers to arrangements that substantially restrict competition. It prohibits agreements between undertakings that substantially reduce, or potentially reduce, competition within the national market or in a substantial part of it;
2. Article 3 (like Article 86 [now 82] of the Treaty) deals with abuses of dominant position. It prohibits one or more undertakings from abusing a dominant position on the national market or a substantial part of it. A company is said to hold a dominant position when it accounts for a majority of the sales in a given market and when, because of the economic features and/or institutional constraints in that market, the possibilities for other competitors, actual or potential, entering and competing with it in that market are limited. This would therefore allow the company to behave in a manner that is substantially independent of both competitors and consumers. The law does not prohibit a dominant position as such, but it places restrictions on the possible behaviour of an undertaking occupying a dominant position;
3. Article 4 (like Article 85 [now 81], para 3 of the Treaty) provides temporary exemption for restrictive agreements, but only under strict conditions. When these conditions are met, the competition authority is empowered to authorise agreements which restrict competition for a limited period of time. In order to qualify for this exemption, the companies concerned must show that the agreements improve supply conditions on the market, that the limitations on competition are absolutely necessary in order to obtain these positive effects, and that the improved conditions of supply bring a substantial benefit to consumers (for example, by reducing prices or providing a good or service which would not otherwise be available);
4. Articles 5-6 deal with the ex ante merger control. Article 1 of the Law clearly states that the Law "shall be interpreted in accordance with the principles of the European Community competition law." A "concentration" occurs when one company merges with another or acquires control over another, enabling it to exercise a decisive influence on its operations, The Act therefore requires advance notification of all mergers and acquisitions when the gross aggregate turnover on Italian territory of the acquired company exceeds €39m or when the gross turnover in Italy of all the companies involved in the merger exceeds €387m (set 3 June 2002). These thresholds are updated each year to take account of inflation. The new arrangement specifies clearly when there is no obligation to submit notification: there are special exemptions for transitional acquisitions by banks or financial institutions of shares in firms; co-operative joint-ventures and for "infragroups" – mergers involving undertakings controlled by a single firm. In addition no notification is required when the parties involved do not carry out an economic activity that affects national markets.

The Italian Competition Authority examines all of the operations notified in terms of their effects on competition. If it feels that a particular concentration creates or strengthens a dominant position to the extent that it reduces competition substantially and on a lasting basis, it prohibits it (under Section 6 of the Act).

**4.4 – Lessons to be drawn by new member states from competition policy experience**

The bilateral Europe Agreements concluded between the EU and each of the ten candidate countries from Central and Eastern Europe at the beginnings of the 1990s provided the countries with a solid legal basis in preparation for accession. In the area of competition policy, a basic principle in each of the Europe Agreements was that restrictive agreements between undertakings, abuse of dominance by undertakings and any state aid which

threatened to distort competition were incompatible with the Agreements on the grounds that these practices might affect trade between the Community and the associated country.

Likewise, the Copenhagen criteria for accession to the EU which set out the pre-accession strategy for these countries and the annual reports by the Commission on how each country was complying with that strategy underlined importance of competition rules. Specifically they required that three elements were in place before the competition 'chapter' in the acquis negotiations were closed: the necessary legislative framework with respect to antitrust and state aids; the state must be seen to have an adequate capacity to administer the regime it had set up and demonstrate this by a credible enforcement record of the acquis in all areas of competition policy.

The convergence and harmonisation trends in CEECs are evident although the mechanisms leading to convergence are different. While for the EU Member States it has been an evolutionary and learning process, for the candidate countries there has been a direct pressure to converge through legal "approximation of existing and future legislation to that of the Community." Consequently, the EU pressures are stronger for the applicant countries. For example, the European Commission's White Paper on Enlargement (1995) required stricter conformity of national law with the EC law: it required, for example, not only not only that EU rules had to be adopted but that EU case law should be adhered to. In this respect, the White Paper demanded more of the CEECs than of the EU member States.

Different mechanisms of convergence may have lasting implications. The candidate countries should be particularly well-placed to perform the function of maintaining the competition rules since much effort is currently being placed on such activities. Moreover, the competition authorities are also already accustomed to applying the rules of the competition *acquis* since most of have modelled their domestic competition laws on these rules.

Comparing evolution and implementation of competition policies in the EU Member States on the one hand and the Candidate Countries on the other brings out differences. There are some lessons to be drawn from the EU Member States' experience that are relevant for the current accession process and future membership:

1. *Protection of the consumer*. Consumer policy is integrated with competition policy. While it is generally understood that competition policy improves overall economic efficiency, its effect on consumers is often neglected. There is the direct impact of competition policy on consumer welfare. When competitive conditions are in place, producers try to attract customers by offering them a lower price, higher quality or better service than their competitors. Consumers also benefit in the long run when efforts made by firms to overcome their competitors eventually lead to greater innovation and efficiency in the production of certain goods or services. Hence, state aid policy, merger control and antitrust enforcement all have their part to play in securing for consumers the benefits deriving from the application of competition rules.
2. *Promoting small and medium size enterprises (SMEs).* The EU follows a protectionist policy with regard to the SME sector. While an abuse of a dominant position is prohibited, agreements and practices which enable SMEs to co-operate with one another and to form strategic alliances without damaging the interests of consumers or trade between Member States are currently permitted. This provides an important lead to candidate countries as to the type of industrial policy being promoted by Brussels.

3. *Promoting business lobbying in Brussels.* This is one of the dimensions that have not won enough attention. While the EU dimension has taken on considerable importance for industry in the CEECs, they have not to date recognised the importance of bringing pressure to bear directly in Brussels, rather than just upon their own governments. To be effective Central and East European industrial firms and groupings must intensify their direct pressure and lobbying in Brussels. After accession, the number of firms with offices in Brussels must certainly increase and the continuing expansion of the lobbying business should be advocated.
4. *Fostering competition culture and business awareness.* Although much has changed over the course of the last ten years, there remains, especially amongst those who were involved in state enterprises prior to the 1990s, too much of a 'producer oriented' culture in which the convenience of the producer rather than the consumer is paramount. Fostering a more competitive, consumer oriented culture is important. This involves encouraging participation and consultation with consumers and business groups when developing policy and making sure that the consumer view is always considered.
5. *Protecting the independence of the Competition Office*. It is important to develop and enhance the framework for independent regulatory agencies but as with taking account of the consumer view, too often regulation is seen as a proxy for imposing the government view. For this reason it is essential that the Competition Office is independent and free from political control.
6. *New regulatory challenges for CEECs*. There is the clear shift of the role of competition policy in regulatory reform for the CEECs. While at the beginning of the 1990s the major goal was to create conditions for market-based development through restructuring, privatisation, trade liberalisation, and the control of traditional monopolies, most enforcement of competition rules has concentrated on problems of dominance. In this regard, the monitoring of anti-competitive state aid is a high priority. Moreover, for regulatory reforms to be beneficial, the regulatory regimes themselves need to be transparent, coherent, and comprehensive. It is no good eradicating subsidies only to re-create the anti-competitive conditions through political patronage.
7. *Co-operation with other competition offices and participation in competition networks***.** The increasingly global markets pose a challenge to national competition enforcers. Active co-operation among competition authorities, bilaterally and multilaterally, already takes place between member states of the EU and has already been extended to the CEECs in developing their own policies in response to accession responsibilities. Once they become full Member States, their antitrust authorities will become an integral part of this active antitrust enforcement network and it will provide them with opportunities both of mutual support and to continue to learn from their counterparts in other states.

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# Section 5 – State Aids Policy

## *5.1 – Introduction*

In common parlance, industrial policy is often taken to be about the state intervening to offer companies monetary incentives to follow a particular course of action. These incentives, whether in the form of subsidies, grants, loans or tax rebates, and whether from central or lower tiers of government, go under the generic name of state aids. They are highly pervasive. Within the EU as a whole, state aids within the manufacturing sector still account for some 2 per cent of value added in that sector (down from 3 per cent in 1995 and 4 per cent in 1990) or approximately €1,000 per person employed in that sector (European Commission, 2000b; see also section 5.2 below). However, and this is the starting point, all such aid is considered to distort competition between companies and therefore to have a damaging effect on competition. It is this principle which prompted the authors of the EC Treaty to confer on the Commission responsibility for controlling the conditions under which aid may be granted.

As was made clear in the previous section, control of state aid in the EU had to be established progressively from scratch. Traditionally such control was unknown to member states, whether they were organised as central states, federations or confederations. Neither the authors of the Treaties, nor the High Authority of the ECSC, nor the Commission had recourse to earlier international or national practice. State aid control has in this sense been forged by the European Union and is a unique feature of that Union. Indeed, it was EU experience which inspired the successive GATT subsidy codes and the development of the OECD and WTO guidelines, not the other way round (Walther and Joels, 1998).

The general parameters of state aid control are established by Articles 87 to 89 of the Treaty (previously Articles 92-94). Article 87 imposes a prohibition against any state aid which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods, to the extent that it affects trade between Member States (Article 87 (1)). Paragraphs (2) and (3) modify this prohibition by permitting state aid in defined circumstances, Article 87 (2) listing types of aid which *are* deemed to be compatible with the Common Market, and Article 87 (3) listing those that *may* be compatible. Of particular relevance to the industrial policy brief are those listed under 87 (3) which grants discretionary power to the Commission to adopt legislation and guidelines directed to member states, including on aid for R&D and regional aid (see European Commission, 2000a).

Article 88, with certain safeguards, empowers the Commission to decide on the compatibility of state aid and to require the abolition or alteration of illegal aid within a specified period. Default by a member state can result in referral to the Court of Justice. Article 88 (1) mandates the Commission, in co-operation with member states, to keep all systems of aid under review. Member states are obliged to notify the Commission of intended state aid and to await Commission authorisation before putting it into effect (European Commission, 2000a).

## *5.2 – Some Comparative Statistics*

Table 5.1 derives from successive Commission Surveys of State Aids. The figures relate only to aid for manufacturing industry and show this both as a percentage of GDP (value added) derived from manufacturing and in terms of euros per person working in manufacturing

industry. The latter are in current, not inflation-adjusted terms. A number of trends are apparent.

- Taking EU12/15 as a whole, the contribution of state aid to manufacturing has halved between the early 1980s and the late 1990s, from 4.8 per cent to 2.3 per cent of manufacturing value added. This is mirrored in the separate figures for each country.
- Of the six countries in the study, Italy had the highest level of subsidies, averaging 9.5 per cent of manufacturing value added in the early 1980s but down to 4.4 per cent by the late 1990s.
- In the early 1980s, Germany recorded the lowest level of support, but this changed with re-unification in 1990. Looking back at the figures in terms of euros per person employed in manufacturing highlights how much support has gone to the Eastern Länder. In the period 1992-4 this averaged €10,816 per worker compared to €527 in the former West Germany. Even in 1996-8, it was €6,021 for the Eastern Länder compared to €435 for the West.
- The UK began the period with a figure – 3.8 per cent of manufacturing value added – higher than the German figure, but lower than the other four countries and below the EU average. This fell consistently through the period under consideration and by the mid-1990s was down to 0.6 per cent of manufacturing value added – €317 per worker in manufacturing, well below even the figure for the Western Länder.
- Sweden, for which figures are only available from 1994, is the only country to show a proportionate share as low as the UK, but has significantly higher spending per worker than the UK.

Table 5.2 examines these statistics in more detail, looking at the proportion of state aids devoted to different objectives. The broad division is by Horizontal Objectives (A), comprehending such objectives as supporting R&D, SMEs, exports, etc; Sectoral Support (B) for such sectors as steel, shipbuilding, motor cars; and Regional Objectives (C), with support for Objective 1 regions differentiated from others.

This table shows clearly how different countries have different mixes of support. Germany has traditionally concentrated on horizontal support measures and regional policy, with little overt sectoral support (in manufacturing – both the coal and transport sectors have been quite heavily subsidised in Germany). Over time, with the concentration of support on the new Länder, regional support has grown the more important and the proportion devoted to horizontal policies diminished. France, by contrast, put little into regional policies in the early 1980s, concentrating its efforts on horizontal and sectoral support. By the mid-1990s, the share of regional aid had grown to 34 per cent (having been only 5 per cent in the early 1950s) and the shares going to horizontal and sectoral subsidies were proportionately diminished. Ireland, where 30 per cent of aid in the early 1980s went on sectoral support, had cut this share to 7 per cent by 1994-6 but, again, increased its regional funding. Italy, which had traditionally put a high share of its aid into regional policy, increased this share from 44 per cent in 1971-86 to 58 per cent by 1994-6 and 72 per cent by 1996-8. (As Table 5.1 reminds us, Italy cut its funding per worker over the same period from €4,360 to €1,195: in other words, as it cut back its subsidies, so the concentration on the poorest areas increased.) The UK, where sectoral aid has at times been quite high (reflecting to some degree pay-offs for privatisation) had by the late 1990s eliminated sectoral aid almost entirely, with funding concentrated on horizontal and regional policies.

Table 5.2A also provides some indication of the proportions of state aid going to R&D and SMEs. While the proportion of support for both objectives increased over the period 1981-98, the change was more dramatic for SMEs, with the UK, for example, increasing the share of its funding devoted to SMEs from 4 per cent in 1981-6 to 21 per cent in 1996-8; Germany upping its share over the same period from 2 per cent to 9 per cent, and France from 4 per cent to 7 per cent. R&D, as a whole, more or less held its position over the period, but interestingly Germany registered a drop in its support (from 22 to 10 per cent of all aid to manufacturing industry – this, of course, reflects the huge increase in the amount going to the Eastern Länder) whereas France showed an increase from approximately 10 per cent in the mid-1980s to 27-28 per cent by the late 1990s.

Table 5.2C shows the proportion of regional aid going to Objective 1 regions. For Ireland and Italy this accounts for more or less all regional aid. For Germany, with the Eastern Länder all having Objective 1 status in the 1990s, it constitutes a large proportion of the total in these years. Much of the UK share goes to Northern Ireland which has had Objective 1 status (or its equivalent) throughout this period (but other regions, eg, Merseyside, have also had Objective 1 status). Note that of the €317 per worker devoted to supporting manufacturing in the UK in 1994-6, almost half is devoted to Objective 1 regions, much of this going to Northern Ireland.

Table 5.3 provides an overview of direct government financing of business R&D. The figures, given as a percentage of GDP, represent two elements. First, direct subsidies to R&D – for example, the German scheme for small businesses which in the early 1980s paid a 50 per cent salary subsidy for scientists and engineers employed on R&D. Secondly, it reflects public procurement programmes, where the government funds the R&D related to the purchase, for example, of military equipment. This explains the high figures for France, Britain, Sweden and the USA. Changes over the period 1981-97 indicate substantial reductions in support in France, the UK and the USA, reflecting the cuts in military procurement expenditures, while Sweden's military R&D spending has increased and, as this table indicates, a part of this benefits Swedish industry. Italy's increased spending reflects the R&D subsidy introduced in the early 1990s in order to encourage higher levels of business R&D, and Ireland's increase reflects their government's increasing emphasis on innovation. Both Ireland and Italy start from a very low base.

**Table 5.1: State Aids to manufacturing industry as percentage manufacturing value added and in euros per person employed**

| | 1981-86 | | 1986-88 | | 1990-92 | | 1992-94 | | 1994-6 | | 1996-8 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % mf added value | *€ per person employed in mf* | % mf added value | *€ per person employed in mf* | % mf added value | *€ per person employed in mf* | % mf added value | *€ per person employed in mf* | % mf added value | *€ per person employed in mf* | % mf added value | *€ per person employed in mf* |
| France | 4.9 | *1,886* | 3.7 | *1,456* | 2.7 | *1,114* | 2.4 | *1,174* | 1.7 | *895* | 2.0 | *1,131* |
| Germany* | 3.0 | *1,055* | 2.7 | *1,135* | 3.5 | | 4.4 | | 3.8 | | 2.6 | |
| Old Länder | | | | | | *921* | | *527* | | *451* | | *435* |
| New Länder | | | | | | *5,415* | | *10,816* | | *8,783* | | *6,021* |
| Ireland | 7.9 | *2,738* | 6.1 | *2,504* | 2.7 | *1,271* | 1.7 | *818* | 1.3 | *909* | 1.9 | *1,458* |
| Italy | 9.5 | *4,360* | 6.7 | *3,136* | 8.9 | *2,397* | 6.4 | *2,205* | 5.5 | *2,419* | 4.4 | *1,955* |
| Sweden | na | *na* | na | *na* | na | *na* | na | *na* | 0.8 | *421* | 0.8 | *441* |
| UK | 3.8 | *1,115* | 2.7 | *806* | 1.4 | *439* | 0.9 | *345* | 0.6 | *317* | 0.7 | *334* |
| EU12/15** | 4.8 | *1,761* | 4.0 | *1,515* | 3.8 | *1,296* | 3.5 | *1,339* | 2.8 | *1,292* | 2.3 | *1,113* |

*up to 1990, West Germany only. After 1990 including the new Länder
**EU 12 up to 1992-4; EU15 from 1994-6

*Source*: Table 2.22 – Synthesis Study (Sharp, 2000), itself derived from European Commission: Second, Fifth, Sixth and Eight Surveys of State Aids in the European Community. CEC 1990, 1997, 1998, 2000

**Table 5.2: Percentage of state aids to industry devoted to different objectives**

**Table 5.2A: Horizontal Objectives**

| | *1981-86* | | | *1986-88* | | | *1990-92* | | | *1992-94* | | | *1994-96* | | | *1996-98* | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | ***of which*** | | **Total** | ***of which*** | | **Total** | ***of which*** | | **Total** | ***of which*** | | **Total** | ***of which*** | | **Total** | ***of which*** | |
| | | ***R&D*** | ***SMEs*** | | ***R&D*** | ***SMEs*** | | ***R&D*** | ***SMEs*** | | ***R&D*** | ***SMEs*** | | ***R&D*** | ***SMEs*** | | ***R&D*** | ***SMEs*** |
| France | 67 | *4* | *4* | 50 | *10* | *6* | 66 | - | - | 44 | *13* | *3* | 51 | *28* | *6* | 52 | *27* | *7* |
| Germany | 40 | *22* | *2* | 35 | *18* | *8* | 16 | - | - | 15 | *4* | *5* | 19 | *7* | *5* | 27 | *10* | *9* |
| Ireland | 26 | *3* | *3* | 47 | *5* | *6* | 31 | - | - | 15 | *2* | *5* | 37 | *6* | *17* | 40 | *5* | *10* |
| Italy | 35 | *2* | *7* | 34 | *5* | *10* | 25 | - | - | 27 | *2* | *8* | 31 | *3* | *6* | 23 | *3* | *8* |
| Sweden | - | - | - | - | - | - | - | - | - | - | - | - | 34 | *11* | *16* | 44 | *10* | *16* |
| UK | 45 | *11* | *4* | 39 | *16* | *10* | 50 | - | - | 35 | *16* | *17* | 22 | *12* | *4* | 39 | *11* | *21* |
| EU12/15 | 47 | *9* | *6* | 41 | *11* | *7* | 35 | - | - | 30 | *7* | *6* | 30 | *9* | *7* | 35 | *11* | *9* |

**Table 5.2B: Sectoral Objectives**

| | ***1981-86*** | ***1986-88*** | ***1990-92*** | ***1992-94*** | ***1994-96*** | ***1996-98*** |
|---|---|---|---|---|---|---|
| | Total | Total | Total | Total | Total | Total |
| France | 25 | 41 | 17 | 38 | 15 | 8 |
| Germany | 5 | 5 | 3 | 5 | 7 | 5 |
| Ireland | 30 | 14 | 0 | 11 | 17 | 5 |
| Italy | 21 | 11 | 18 | 22 | 11 | 5 |
| Sweden | - | - | - | - | 4 | 0 |
| UK | 15 | 24 | 35 | 17 | 19 | 1 |
| EU12/15 | 16 | 20 | 15 | 17 | 13 | 8 |

**Table 5.2C: Regional Objectives**

| | ***1981-86*** | | ***1986-88*** | | ***1990-92*** | | ***1992-94*** | | ***1994-96*** | | ***1996-98*** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | *of which* Obj 1 | Total | *of which* Obj 1 | Total | *of which* Obj 1 | Total | *of which* Obj 1 | Total | *of which* Obj 1 | Total | *of which* Obj 1 |
| France | 5 | *3* | 9 | *3* | 17 | | 18 | *9* | 34 | *12* | 40 | *12* |
| Germany | 55 | *49* | 60 | *54* | 81 | | 80 | *68* | 74 | *69* | 68 | *63* |
| Ireland | 44 | *44* | 39 | *39* | 69 | | 73 | *73* | 56 | *56* | 55 | *55* |
| Italy | 44 | *39* | 55 | *47* | 57 | | 50 | *48* | 58 | *55* | 72 | *69* |
| Sweden | - | - | - | - | - | | - | - | 61 | *0* | 56 | *0* |
| UK | 34 | *33* | 37 | *29* | 31 | | 48 | *32* | 59 | *43* | 60 | *44* |
| EU12/15 | 37 | *18* | 39 | *25* | 50 | | 53 | *45* | 56 | *48* | 57 | *46* |

*Source*: Table 2.23 in Synthesis Study (Sharp, 2000), itself derived from European Commission: Second, Fifth, Sixth and Eight Surveys of State Aids in the European Community. CEC 1990, 1997, 1998, 2000

**Table: 5.3 Government financing of business sector R&D as percentage GDP***

| | 1981 | 1991 | 1997 | Change 1981-97 |
|---|---|---|---|---|
| Germany | 0.29 | 0.18 | 0.14 | -0.15 |
| France | 0.29 | 0.33 | 0.15 | -0.14 |
| Ireland | 0.04 | 0.02 | 0.06 | 0.02 |
| Italy | 0.04 | 0.09 | 0.08 | 0.04 |
| Sweden | 0.20 | 0.20 | 0.22 | 0.02 |
| UK | 0.45 | 0.21 | 0.13 | -0.32 |
| USA | 0.54 | 0.46 | 0.31 | -0.23 |
| Japan | 0.03 | 0.03 | 0.03 | 0.00 |

*Derived by subtracting for each country business sector expenditures by sector of performance from business sector expenditures by source of funds. It is assumed that the higher education sector does not fund any R&D in the business sector and therefore that the new flow of funds is from the government sector into business. To the extent to which business invests in the higher education sector, there is an under-estimation of these totals. They therefore represent a minimum rather than a maximum estimate.

*Source*: Table 2.24 in the Synthesis Report (Sharp, 2000), itself derived from OECD Basic Science and Technology Statistics 1999

Table 5.4**,** which relates only to the 1990s, reflects a recent OECD exercise to develop comparable statistics on industrial and R&D support/incentive schemes between countries (OECD, 1998). The table presents two different sets of data. First, subsidies as a percentage of GDP for 1990 and 1997 and, secondly, changes in tax subsidies (incentives) between the same two years. The first part of the table was based on a dataset collected on only 10 countries: Ireland, Italy and Sweden were not included and therefore do not feature in this half of the table. Like the statistics on state aids in Tables 5.1 and 5.2, this table details support to industry but it only describes developments over the 1990s. A number of features are worth noting. First, the general reduction in subsidies over the course of these seven years (except for Japan where there is a marginal increase). Secondly, that the bulk of this reduction actually comes in reductions of support for procurement (picking up again the cuts in the military procurement budget). Thirdly, the final column relating to tax subsidies, suggests that countries are switching away from direct R&D subsidies towards tax incentives.

The general picture on state aids that emerges from these statistics is of a substantial overall reduction from the early 1980s to the present day; of that reduction applying particularly to sectoral support which had largely disappeared by the late 1990s; and of the bulk of aid, within countries, now being targeted at regional priorities and horizontal support for innovation. Nevertheless, there are substantial variations between countries both in the amount of aid paid out and in the purposes to which it is put. Italy remains at the top of the league table spending in the late 1990s almost €2,000 per person employed, with the bulk of this going to regional aid. Ireland and France both spent approximately €1,000 per person employed, while Sweden, the UK and the old Länder of Germany all fall in the €300-400 level, the UK lowest at €334 per person employed. For all countries except France (40 per cent), regional assistance now forms approximately two thirds of state aid, with small firms and R&D absorbing most of the remainder.

## Table 5.4: Government support for industrial technology, 1990-1997/8

| | Subsidies as percentage of GDP | | | | | | | Change in tax subsidies per US $ R&D 1990-97 |
|---|---|---|---|---|---|---|---|---|
| | 1990 | | | 1997 | | | Change in total 1990-97 | |
| | Total | Procurement | Other | Total | Procurement | Other | | |
| Germany | 0.55 | 0.19 | 0.36 | 0.37 | 0.13 | 0.24 | -0.18 | +0.003 |
| France | 0.63 | 0.36 | 0.27 | 0.51[a] | 0.30[a] | 0.21[a] | -0.12 | -0.003 |
| Ireland | - | - | - | 0 | - | - | - | +0.063 |
| Italy | - | - | - | 0 | - | - | - | +0.013 |
| Sweden | - | - | - | - | - | - | - | +0.009 |
| UK | 0.57 | 0.39 | 0.18 | 0.40 | 0.31 | 0.09 | -0.17 | -Nil[b] |
| USA | 0.76 | 0.63 | 0.13 | 0.54 | 0.43 | 0.11 | -0.22 | -0.024 |
| Japan | 0.20 | 0.08 | 0.12 | 0.27 | 0.13 | 0.12 | +0.07 | +0.125 |

a 1995

b The UK has had no tax incentives for R&D. From March 2000 a tax credit scheme on R&D is being introduced for small businesses.

*Source*: Table 2.25 in Synthesis Study (Sharp, 2000), itself derived from OECD Science, Technology and Industry Scoreboard, 1999. Tables 4.3.1 and 4.4.1.

### *5.3 – New Guidelines for the 1990s*

Over the course of time the EU has developed a fairly coherent state aids policy which is clearly set down and understood by member states. At its centre is the requirement that all member states not only inform the Commission of any state aid granted to enterprises, but also seek prior approval from the Commission *before* they award such aid. The Commission is the body empowered to develop the Community's state aid policy and has gradually built this up through, on the one hand, case law (because of the role played by the European Court of Justice in cases of default or appeal) and on the other through the establishment of policy frameworks, communications and notices.

The application of these principles helps to explain some of the high profile cases which have reached the headlines. Some of the best known of these involved the motor vehicle industry – the Renault and Peugeot cases of 1988, the Alfa Romeo case of 1989, and the British Aerospace/Rover case of 1993. All involved the issue of the "recovery" (ie, paying back) of sums unlawfully granted, with the European Court of Justice upholding the Commission's position that recovery was the "logical consequence" of a finding that aid had been unlawfully given. It also helps to explain why the substantial grants to foreign firms in, for example, Wales or the North East of England (see UK case study (Sharp, 2000), pp49-50), have not been questioned by the Commission, namely because they involved setting up new plants in disadvantaged regions.

The Commission sets out clear guidelines for such grants. Regional grants must generally support investment expenditures and go to regions which are either classed as Objective 1 regions (per capita GDP lower than 75 per cent EU average) or to regions classed by the member state concerned as disadvantaged compared to national average (in these cases the member state government has to justify this categorisation to the Commission). For Objective 1 regions where per capita incomes are less than 60 per cent of EU average incomes the maximum grant for a large firm is limited to 50 per cent of total expenditures with an extra 15 per cent allowable for SMEs. Where income is over 60 per cent of the EU average, then a 40 per cent maximum is applied. For regions other than Objective 1 regions, the maximum grant is 30 per cent. And a time limit of five years is put on its employment. When, exceptionally, the aid is for operating expenditures, the grant is again time limited and has to be progressively reduced (European Commission, 2000a).

These frameworks lay down a number of clear principles which are now widely acknowledged and adhered to by member states. These are:

1. that aid must be *economically necessary* in order to bring about the desired development – ie, the development would not be carried out without the aid;
2. assistance should be *confined to pump-priming* and must be limited in time;
3. assistance *must benefit* not just the firm, region or state to which it is applied but the *Community as a whole*;
4. aid which helps promote policies which already carry *Community-wide consensus* behind them (eg, to promote cohesion or R&D) are *more likely to be deemed compatible* with the common market. Conversely, aid to sectors where there is over capacity and fierce competition between firms in the Community can only be authorised subject to strict conditions. (Hence the conditions for shipbuilding, steel and motor vehicles.)

From these principles a broad set of clear-cut, transparent and consistently applied rules have been derived. They distinguish between aid which is or may be declared compatible with the Treaty, namely regional aid; aid to SMEs; aid to promote R&D or environmental protection; and aid for the creation of employment, especially when associated with training; and that considered incompatible, namely general investment support for large companies (unless in disadvantaged areas), export aid and aid to cover current running expenses of firms. In addition, particular scrutiny applies to rescue or restructuring aid; to aid between the state and nationalised enterprises; and aid to companies in the so-called 'sensitive' sectors of shipbuilding, steel, motor vehicles and synthetic fibres.

### *5.4 – Aid for R&D and SMEs – the New 1996 Protocol*

A new R&D protocol was agreed in 1996 that sets out similar rules for R&D aid.[7] First, R&D support for public financed higher education or research establishments is not considered as 'state aid'. Nor, more controversially (given its role in the defence sector), is public procurement of R&D, but there have to be open tender conditions. A distinction is also drawn between fundamental research, and industrial and pre-competitive research. Grants up to 100 per cent are permissible for fundamental research, 50 per cent on industrial research and 25 per cent on pre-competitive research, with extra permissible according to regional location, linkage to the EU's Framework Programme or SME involvement, with the ceiling set at 75 per cent for industrial and 50 per cent for pre-competitive R&D. Eligible costs are personnel costs for staff employed on research activities, and/or costs associated with equipment or operating costs of the activity. When applied to large companies, aid has to be shown to have an 'incentive effect' on company R&D, in effect to show that it would not have been undertaken without the grant.

For SMEs, defined as firms with fewer than 250 employees (small enterprises being less than 50) another set of guidelines apply, with (outside the regional grant areas where the maxima discussed above apply) small firms being able to claim up to 15 per cent, and SMEs 7.5 per cent, of investment expenses either in actual equipment or in technology transfer, with 50 per cent grants allowable for 'soft aid' in such things as consultancy and knowledge dissemination.

### *5.5 – Impact of Rules on Individual Countries – Sticks and Carrots*

Looking at the impact of EU state aids legislation on the individual countries involved with our study, it is possible to observe both a negative and a positive impact.

The negative impact has been to *constrain* national initiatives. These may be seen from a national perspective as negative, but from a broader perspective as having positive effects, particularly perhaps from a consumer point of view. Examples are plentiful:

- in the late 1970s and early 1980s, Community shipbuilding initiatives affecting Britain, France and Germany (in our sample) helped to bring the level of subsidy down from the very high levels of the early 1980s. These *averaged* 34 per cent in 1981-6, but in some countries were as high as 70 per cent in the late 1970s when a competitive subside regime was threatening between the 'old' shipbuilding countries of Europe and the 'new'

[7] Community Framework for state aid for research and development. OJ C83 – 11:04:86 as amended by OJ C45-17:02:96.

shipbuilders in Japan, Korea and Taiwan. Action by the European Commission was instrumental in stopping this self-defeating level of subsides.

- Commission initiatives also limited the subsidies that could be offered to foreign companies to encourage location of new plants. Both the UK and Ireland were engaged in competitive bidding for footloose foreign investments in the early 1980s (Belgium and the Netherlands were also involved but are not countries included in this project) and again bidding threatened to escalate. Commission rules which limited handouts to those acceptable under general rules (regional, R&D, etc) both limited the subsidies involved and channelled such investments into regions of high unemployment. From the early 1980s, for example, British subsidies to foreign firms locating in the UK have been limited to those available under what is known as 'special regional assistance'. Even in the 1990s, this has been averaging €225m pa. It has, however, been instrumental to attracting Nissan to the north-east of England, Toyota to Derby, Ford engines to Bridgend in Wales and NEC to Scotland (see UK Study, Sharp 1999, pp48-49).
- Germany in the 1970s, fearful of the *lack* of investment in R&D by its SMEs, introduced its FRG Personnel Programme that paid initially (1979-84) 40 per cent of the salaries of those employed in R&D and subsequently (1984-87) 55 per cent. After 1987 the scheme was disbanded at the behest of the Commission, mainly because it was seen to have achieved its mission (see Reinhard, 1999, p27). It was reintroduced in 1991 to help boost RTD employment in the SMEs of the Eastern Länder. Evaluations of the early scheme indicated that it had been taken up by 10,000 companies, 66 per cent of which had not employed RTD personnel before (CEC, 1998, pp330-1).
- In 1988, when the British government sold the Rover group to British Aerospace it included a €75m subsidy which was not initially revealed to the Commission. When news of the subsidy subsequently leaked out to the newspapers, Rover was forced to repay. This was a seminal case which eventually went to the European Court (1993). Earlier the Commission had contested proposed aid from the French government to Renault and Peugeot (1988), and from the Italian government to Alfa-Romeo (1989). In all three cases the Court upheld the Commission's viewpoint and this success did much to reinforce the Commission's position in constraining so called *ad hoc* subsidies for restructuring.
- The Irish government have long attracted FDI by offering attractive tax treatment to profits. In recent years the Commission have been examining tax regimes as well as subsidies and in 1997 concluded that the Irish Corporation Tax (ICT) constituted a state aid. As a result the Seventh Survey of State Aids (CEC, 1999, p4 and Table 8, p16), included for the first time a figure of €391m for corporation tax forgone by the Irish government. (This helps to explain the apparent increase in state aid in Ireland between 1994-6 and 1996-8 shown in Table 1.1. In the light of this decision, the Irish government have now modified the Corporation tax position.)

The *positive impact* of state aids legislation can be seen in the types of subsidy regime being introduced by the different countries in the course of the 1990s. As indicated, state aids to promote R&D, SMEs and regional objectives were generally seen as compatible with single market objectives, whereas sectoral schemes or *ad hoc* aid for restructuring in declining industrial sectors were not seen as compatible. The result, as might be expected, is that many new schemes aim to promote R&D, SMEs and/or regional objectives.

- France introduced in 1988 a tax credit scheme for research which by 1993 was worth over €100,000 per company (European Commission, 1997, p328). More recently in 1994 Ireland also introduced a tax credit scheme in an attempt to boost R&D expenditures from

indigenous enterprises, and the UK introduced a tax credit applicable only to SMEs in the Budget of March 2000.

- France through its CORTECHS and CIFRE programmes, Ireland through its Techman/Techstart programme, the UK through its Teaching Company and CASE studentship schemes, all support the employment of graduate students and young scientists in (mainly) SMEs. All the schemes have been subjected to evaluations and show positive results – better links with HEIs and technology know-how organisations; raised awareness of new technology and increases in turnover as a result of using new technology (European Commission, 1998, Table 6c7). In all cases the cost of the scheme was small – the most expensive was the UK's Teaching Company Scheme at €15m pa (European Commission, 1998, Table 6c6). The Netherlands (not one of the countries covered in our project) introduced an R&D personnel tax credit scheme based on personnel costs (not total costs) of R&D which was widely taken up and cost €169m in 1995 (amounting to 3.5 per cent of their GERD) (European Commission, 1998, Table 6c5). It was judged very successful in its main objective of encouraging more companies to undertake R&D.
- The UK introduced its SMART (Small Firms Merit Award for Research and Technology) and SPUR (Support for Products Under Research) in 1986 as programmes deliberately aimed to help entrepreneurial firms with R&D expenses. The LINK programme, which helps fund collaborative R&D between HEIs and industry was introduced in 1987. All fitted with the UK government's own preference to fund only 'far from market' R&D and/or help for SMEs (see Sharp, 1999, pp47-48). All programmes have over time been extended and added to – there are, for example, a series of 'challenge' programmes for universities and start-up firms encouraging university-industry links – and what was originally a budget of €50m a year (covering SMART, SPUR, LINK and the Teaching Company Scheme) had by 1997 expanded to a budget of approximately €250m (see Sharp, 1999, Table 4.1). It is noteworthy that the UK's *only* other industrial support programme of equivalent size was its Business Links programme of support for SMEs. In other words UK state aid by the mid-1990s was channelled almost exclusively into R&D, SMEs and special regional assistance encouraging foreign investment into the less advantaged areas of the UK.
- Ireland's Programme of Advanced Technology (PAT) introduced in the late 1980s was deliberately set to develop an infrastructure in Ireland to support the development of new technologies. It was limited in scope, and selective in choosing locations (usually on university campuses) where it could locate facilities and, by attracting top class researchers, upgrade *both* facilities and capabilities (see Higgins, 1999, p49 *ff*).
- Germany's Bio-Regio programme offered subsidies financed in part by the Federal Government and in part by the Länd (state) government to encourage joint development of facilities by universities and industry to upgrade capabilities and grants, also, to encourage entrepreneurial small firms to set up in the vicinity. Limited finance meant competitive bidding and encouraged Länder governments to work collaboratively with local universities, businesses and banks to put together attractive programmes. Again, the emphasis was on R&D, university/industry links, SMEs and regional development (see German study, Reinhard, 1999, pp39-40).

### *5.6 – German State Aid to the New Länder*

The tables at the beginning of this section drew attention to the very considerable sums expended by Germany during the 1990s in modernising and restructuring the industrial infrastructure of the former East German Länder. In the period 1992-94, for example,

€10,816 *per person employed* in the New Länder was ploughed into helping restructure the industrial base. By 1994-96 this had dropped to €8,783, but even at this level, it was *seven* times the average of the EU15 at €1,292 (European Commission, 2000b, Table 3, p11). By 1996-8 it was reduced to €6,021 with the EU 15 average down to €1,113.

Much of the cost of restructuring in the new Länder was borne by the reduction in the budget of the old Länder. Whereas in 1990-92, the old (West German) Länder benefited from expenditures on aid of €8.9bn, this was reduced to €4.3bn in 1992-4, €3bn in 1994-6, and €2.8bn in 1996-8 (see European Commission, 1997a and 2000b). These very substantial reductions give some indication of the commitment of the German government to shift its efforts to the new Länder without increasing the overall level of aid in Germany.

In addition to direct government aid to the Eastern Länder, aid was also granted via the Treuhandanstalt – the state holding company set up to administer, adapt and privatise the former East German public undertakings. This organisation and its successor, the Bundesanstalt für vereinigungsbeding Sonderaufgaben (BvS) gave guarantees on loans granted by the banking sector (at normal market interest rates) even though some of the enterprises were rated as poor credit risks. The following table gives some indication of the total aid channelled through the Treuband/BvS between 1992 and 1998.

**Table 5.5: Treuhand Aid for restructuring the Eastern Länder**

| | **1992** | **1993** | **1994** | **1995** | **1996** | **1997** | **1998** |
|---|---|---|---|---|---|---|---|
| Treuhand aid (€m) | 5161 | 8774 | 10692 | 6480 | 4693 | 3522 | 2329 |
| As % all EU aid to manufacturing industry | 13 | 20 | 26 | 17 | 14 | 10 | 8 |

*Source*: European Commission (2000b), Table 13, p32.

### *5.7 – Overall Conclusions and lessons to be learned on state aids*

The main conclusion to be drawn from this part of this study is that EU legislation on state aids has had a substantial impact on national policy making. Building on the experience of the late 1970s and early 1980s when competition in subsidies between member states threatened to get out of control, the EU has developed a clear set of guidelines which has, since then, shaped the development of state aids in member states. On the one hand, they have restricted the use by member states of *ad hoc* aid packages aimed at smoothing the restructuring process. For many governments there is temptation to respond to news of closures and redundancies, especially of well-known national firms, with promises of aid and help with modernisation costs. Such pleas have come especially from the motor car industry, but also in other sectors, including growth sectors such as semi-conductors. Commission rules have severely constrained such offers of help and, in so doing, dampened expectations as to what *national* governments may do in such circumstances.

On the other hand, by making it clear that it accepts aid which helps promote innovation, especially by SMEs, and which contributes towards Community objectives such as cohesion and regional development, EU guidelines have channelled national aid programmes increasingly in these directions. Over time, the impact has been substantial with aid packages shifting sharply away from the old sectorally-based support packages towards the new 'horizontal' objectives of innovation, R&D and regional cohesion.

Two factors have helped the Commission achieve this surprisingly powerful position. The first is globalisation. In the context of globalisation many national governments realised at an early stage in the 1980s that the degree of influence any national government can exert on developments within their own nation is limited and that the 'stop the world I want to get off' option was not on offer. The Commission was, therefore, swimming with the tide in terms of the dismantling of strong nationalistic support packages. The second is the fact that the Treaty puts into the hands of the Commission powers to decide which state aids are compatible with Treaty objectives; to keep all such aids under review and, where necessary, to pursue the matter through to the European Court of Justice. There is no doubt that these powers immeasurably strengthen the Commission's hand.

What lessons are to be learned by the CEECs from this experience? There are a number of points worth making:

1. *There are real and substantial constraints on what national governments can do* to help national firms even when there are major problems of restructuring to be tackled. This is an area where the Commission has considerable powers and does not hesitate to intervene. It is foolhardy therefore to make promises which, however politically attractive, cannot be sustained under Commission scrutiny.
2. Equally *Commission guidelines provide some leeway for 'creative thinking'*. Aid packages which promote R&D, innovation and/or SMEs are likely to be viewed more generously, as are packages which seek to help poorer regions. It is important when designing such packages to take the Commission into your confidence and to seek their advice on the sorts of help which they would be prepared to sanction.
3. An indication of the *degree to which the Commission is prepared to be flexible* is given by the amount of aid given to the *East German Länder* in the 1990s. This aid was of course forthcoming from the German government to help the transition process. No CEEC is likely to benefit from so substantial a flow of resources, and, moreover, it is arguable that the 'transition' phase of development is now over. Nevertheless, it does indicate that the Commission recognises the problems faced by the countries of Eastern Europe and the difficulties of moving from the state-run regimes that dominated those countries to the market-led regimes of the West. The need for the state, on occasion, to help nurture new market-led institutions and the cost of creating those institutions is recognised and understood.
4. There are some useful *lessons to be learned in relation to innovation packages* introduced by different governments. In particular, there may be valuable precedents in the German scheme which offered subsidies on the salaries of R&D employees and the Dutch tax credit scheme, both of which seem to have been judged successful in stimulating R&D. It is also worth looking at some of the French schemes for promoting technology transfer and the British Teaching Company Scheme as useful examples of network building between universities and industry.

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## Section 6 – *Regional Policy and the Structural Funds*

6.1 – Background

Regional policy as a form of industrial policy dates back to the depression of the 1930s when job creation was at the top of the agenda and intervention to maintain and create new jobs was condoned in spite of its often overtly protectionist overtones. In post-war Europe it reappeared in a new guise of Keynesian demand management aimed at encouraging investment by both public and private sectors in low growth regions. Private sector investment was encouraged by the availability of grants and loans, the latter often at favourable interest rates, and by tax concessions which allowed investing companies to write off against tax substantial sums of capital investment. Italy and the UK both made extensive use of such capital subsidies to fund major capital intensive investments in their less advantaged regions the hope being that such huge investments would attract other investments and kick-start growth.

By the late 1970s the world began to appreciate the futility of subsidising capital and capital intensive structures when what was required were jobs and labour intensive industries. Since then there has been a substantial redirection of policy with the 'bottom-up' policies developed in some of the German Länder serving as a model. Germany's regional structure was rooted in the post-1945 constitutional settlement and gave considerable autonomy to the regional authorities. In the 1980s, the regions of Nord-Rhein Westfalia and Baden-Würtemberg deliberately set out to encourage local enterprise by building mutual and reinforcing local support networks, both technical and financial, for local firms, predominantly the small and medium sized enterprises (SMEs). This model spread more widely within Germany – and indeed within Europe – in the 1990s. The emphasis was on institutional support and structural change rather than subsidy. Indeed, the sums spent were modest. As the German case study shows, (Reinhard, 1999, pp36-38), leaving aside the substantial sums spent on the rehabilitation of the Eastern Länder, total spending by Federal and Länder authorities on SME support was approximately €900m a year in the late 1990s. This contrasts with the €2-3bn a year being spent on capital subsidies in the UK and Italy in the late 1970s.

Italy and the UK learned their lessons the hard way. In Italy, where the Cassa di Mezzogiorno had taken the lead in subsidising capital intensive projects (such as oil refineries and chemical plants) in the South, new decentralised policies only began to make an impact in the late 1980s. The experience exposed the downside of such policies. While the more dynamic regions of the north and the centre took advantage of new found autonomy, relatively few southern regions had the institutional capabilities (ie, administrative skills) to seize the opportunities offered. (Braga, Cini and Gambardella, 1999, pp70-72) In the UK, the Thatcher government cut regional subsidies sharply in the early 1980s, concentrating funds instead on urban regeneration. Only in the 1990s did policy swing back towards industrial regeneration, with emphasis on innovation and SMEs. The operation remained, however, highly centralised with only Wales and Scotland enjoying the autonomy of their own regional development agencies, and even they had little discretionary power over finance. This changed little with the creation of regional development agencies for every region after the new Labour Government of 1997 came to power. Treasury control over spending of all levels of government in the UK gives little or no discretion to other players (Sharp, 1999, pp54-60).

France, always perceived as the most centralised country in Europe, moved sharply towards decentralisation in the early 1980s, inspired in part by the EU's new found interest in regional policy (see below). Through the mechanism of 'contrâts du plan' negotiated between central government (represented by the préfets at regional level) and the respective regional authorities, a relatively satisfactory joint planning approach emerged with SMEs, technology transfer and university/industry links high on the agenda. As in Italy, these freedoms were exploited to best effect by the stronger, more dynamic regions; and as in Germany, a little money goes a long way. Annual spending by Rhônes-Alpes, the highest spending region, on industrial regeneration amounts to only €75m a year (Braga, Cini and Gambardella, 2000, p54).

Ireland with a population of 3.6 million is the size of a typical EU region; and Sweden with 8 million is somewhat bigger, but still a small country in terms of population. Both came late to regional policy, stimulated by membership of the EU and potential access to the Structural Funds. Indeed Ireland's successful industrial policy, based on building up mutually supportive indigenous capabilities alongside targeted multinational activity, mirrors policy pursued elsewhere at regional level (Higgins, 1999). Sweden, with a large but thinly populated land mass, qualifies for Objective 6 Funding (aimed at helping such regions). As a country it has a strong base in decentralised local government but only in the late 1990s began to consider decentralising industrial policy.

### *6.2 – The Community Structural Funds – some comparative statistics*

The Community Structural Funds were established in 1975 with the creation of the ERDF (European Regional Development Fund). The explicit aim was to reduce the disparities in development between the advanced and least favoured regions (LFR) of the Community by strengthening the local and regional structures of the latter. When established, the budget for the Structural Funds was set at 8 per cent of the total Community budget (€128m in 1975). By 2000 they amounted to some €30bn, and 35 per cent of the EU's total budget of €85bn.

Major reforms were introduced in 1988 motivated by the enlargements of the 1980s which brought Greece (1981), Spain and Portugal (1986) into the Community, greatly increasing the disparities between the better off and poorer member states. Greater resources for regional development, however, also demanded more rigorous policies. The 1988 reforms introduced five main objectives for aid: Objective 1 aimed at development and restructuring in the less developed regions (which included the whole of Greece, Portugal and Ireland,[8] Spain outside Madrid and Barcelona and the whole of Southern Italy); Objective 2 was aimed at helping those areas affected by industrial decline (parts of Northern Britain, for example); Objectives 3 and 4 were for combating long term unemployment and promoting training; and Objective 5 for restructuring agriculture and rural areas. In 1993, with the imminent membership of Sweden and Finland, a further objective, Objective 6, was added covering aid to sparsely populated regions.

Only Objectives 1, 2, 5b (rural restructuring) and 6 are what are known as "regionalised objectives" (ie, based on regional criteria and disbursed on a regional basis). Objectives 3, 4 and 5a (agricultural restructuring) are paid on a country basis. The amounts going to the regional objectives has been much greater than to other objectives, as Table 6.1 shows.

[8] Ireland, which has experienced very fast growth in the 1990s, lost its Objective 1 status in 2000.

**Table 6.1: Community expenditures under different Structural Fund objectives, 1989-99**

| | 1989-93 | | | | 1994-99 | | | |
|---|---|---|---|---|---|---|---|---|
| | MECUs | *% of total* | Amount spent on RTD | *% spent on RTD* | MECUs | *% of total* | Amount spent on RTD | *% spent on RTD* |
| Objective 1 | 43,818 | *70* | 1,280 | *2.9* | 93,972 | *68* | 5,049 | *5.4* |
| 2 | 6,130 | *10* | 705 | *11.5* | 15,352 | *11* | 2,580 | *16.8* |
| 5b | 2,232 | *3* | 32 | *1.4* | 6,860 | *5* | 142 | *2.1* |
| 6 | - | - | - | - | 697 | *0.5* | 5.8 | *8.3* |
| Total for regionalised objectives | 52,180 | *83* | 2,017 | *3.9* | 116,881 | *84.5* | 7,829 | *6.7* |
| Objective 3) 4) | 6,669 | *11* | 453 | *6.8* | 12,938 | *9* | - | - |
| 5a) | 4,102 | 6 | - | - | 6,136 | 4.5 | - | - |
| Total for non-regionalised objectives | 10,771 | *17* | 453 | *4.2* | 21,320 | *15.5* | - | - |
| Total for all objectives | 62,951 | *100* | 2,470 | *3.9* | 138,302 | *100* | 7,829 | *5.7* |

*Source*: European Commission: Second European Report on S&T Indicators 1997, Table 7f.2, p338.

There are considerable variations in funding between countries. Table 6.2, which takes account only of expenditures under Objectives 1, 2, 3, 4 and 5b, shows the variation between the six countries being studied in the project. Italy is the largest recipient of Structural Funds, although Germany, with the New Länder all classified as Objective 1, comes a close second in the period 1994-99. Ireland, in per capita terms, has been a major recipient of Objective 1 money, while France and the UK have benefited more from Objectives 2, 3 and 4. Sweden, not eligible until it joined the EU in 1995, has benefited from a relatively small series of grants via Objective 6, and some funding under Objectives 2, 3, 4 and 5b.

Before 1988, the Structural Funds paid little attention to R&D, but with the reforms of that year greater attention was given to innovation. Table 6.1 shows that in the period 1989-93, 3.9 per cent of spending under the Structural Funds was devoted to R&D, rising to 6.7 per cent in the period 1994-9, with most of this coming from spending under Objectives 1 and 2 (and Objective 6 when this was introduced). As with overall levels between countries, so the proportion devoted to R&D varies. Table 6.2 shows that of the six countries in our study, France and the UK have put the highest percentage of their Structural Funds into R&D and innovation, with Sweden joining them at the top of the table in the 1994-99 period.

The Structural Funds RTD objective for 1989-93 was targeted primarily at strengthening infrastructure, with many member states using the re-direction of objectives as an opportunity to make good the inadequacies of previous funding of RTD. The objectives of the 1994-99 programming period promoted enterprise involvement in RTD, encouraging technology transfer from more advanced to less favoured economies and adopted a strategy of boosting market demand rather than S&T supply (European Commission, 1997b, p20). However, in spite of the greater emphasis on stimulating the demand side – ie, corporate R&D, especially in SMEs – a good deal (arguably too much), was spent on the supply side, especially in terms of new facilities for public research laboratories and universities, many of which had little obvious linkage into the local economy. While such facilities can, in the long run, bring

stable highly paid employment into an area, unless they also act as the nucleus for a cluster of activities – attracting other similar laboratories from public and private sectors and spinning off specialist small firms – then their impact on the local economy can be very limited.

**Table 6.2: Breakdown of Structural Funds by objective and overall expenditures on research and technological development (RTD) (€M)**

| | | Obj 1 | Obj 2 | Objs 3&4 | Obj 5b | Total[1] | RTD | RTD % total |
|---|---|---|---|---|---|---|---|---|
| France | 89-93 | 957 | 1,225 | 1,442 | 874 | 4,498 | 147 | 3.2 |
| | 94-99 | 2,190 | 3,769 | 3,213 | 2,236 | 11,398 | 700 | 6.1 |
| Germany | 89-93 | 2,955 | 581 | 1,054 | 511 | 5,101 | 98 | 1.9 |
| | 94-99 | 13,640 | 119 | 1,941 | 1,227 | 16,927 | 944 | 5.5 |
| Ireland | 89-93 | 4,460 | - | - | - | 4,460 | 167 | 3.7 |
| | 94-99 | 5,620 | - | - | | 5,620 | 316 | 5.6 |
| Italy | 89-93 | 8,504 | 387 | 903 | 360 | 10,154 | 518 | 5.1 |
| | 94-99 | 14,860 | 1,462 | 1,715 | 901 | 18,938 | 1,148 | 6.1 |
| Sweden | 89-93 | - | - | - | - | - | - | - |
| | 94-99 | 247[2] | 157 | 512 | 135 | 1,051 | 42 | 3.9 |
| UK | 89-93 | 793 | 2,015 | 1,502 | 132 | 4,442 | 169 | 3.8 |
| | 94-99 | 2,360 | 4,580 | 3,377 | 817 | 11,134 | 790 | 7.0 |
| EU12 | 89-93 | 43,818 (70%) | 6,130 (10%) | 3,523 (11%) | 2,232 (3%) | 62,951 (100%) | 2,469 | 3.9 |
| EU15 | 94-99 | 93,972 (68%) | 15,352 (11%) | 15,184 (11%) | 6,850 (5%) | 138,201 (100%) | 7,827 | 5.7 |

1 Total excluding agriculture and fisheries aid, but including rural restructuring
2 Objective 6 funding *not* Objective 1.

*Sources*: European Commission (1999), Table 25: European Commission (1997a), Tables 7f.2 and 7f.3c.

The administration of the Structural Funds is complex. Most (90 per cent) of the funds are dispersed to member state or regional governments, who, before receiving them, have to agree the programme framework, known as the Community Support framework (CSF), through which they will operate. Each CSF has, in turn, to be agreed amongst the regions involved. In addition, each region is required to develop a Special Programming Document (SPD) which sets out the specific objectives and measures to be implemented within each region and how these are to be embedded within the broader framework of local/regional development plans. Only when the CSFs and SPDs have been agreed, are funding commitments made by the Brussels authorities. Nevertheless, while the Commission by this means can exert broad influence upon spending plans (eg, more emphasis on SMEs and innovation) it is Member States and regional authorities, not the Commission, who decide on local priorities. In addition, of course, the Commission has to be satisfied that the money being dispersed from the Structural Funds is matched by equivalent funding from Member States and/or their regional authorities and, where appropriate, with a private sector contribution. For example, when, as in Ireland, Structural Funds are being used to subsidise industrial R&D. In addition, the Commission have increasingly been anxious to make sure appropriate evaluation and monitoring procedures are in place before agreeing to commitments. This frequently leads to considerable delay in agreeing SPDs with regional authorities which in turn helps to explain why budget allocations under the Structural Funds are often not fully taken up by the end of the budget period.

In addition to the 90 per cent of funds dispersed under CSF/SPD frameworks, 9 per cent of funds are spent on Community Initiative Programmes (CIPs) which, as their name suggests, are programmes initiated by Brussels, with their financing and implementation then negotiated with regions and member states (see Table 6.3). In the 1989-93 period, one of the most prominent CIP programmes was the STRIDE (Science and Technology for Regional Innovation and Development in Europe) Programme. This €440m programme was particularly aimed at helping Objective 1 regions to improve research capacities. For the second programming period (1994-99) most of the action in RTD and innovation has to come under the SME initiative (co-operation between SMEs, but including co-operation over R&D, technology transfer and with research centres) and the ADAPT programme, again aimed at encouraging inter-firm linkages and co-operation.

**Table 6.3: Allocations under Community Initiative Programmes (CIP) (€M)**

| | 1989-93 | of which STRIDE | 1994-9 | of which SME | ADAPT |
|---|---|---|---|---|---|
| France | 566 | 16.4 | 1605 | 58 | 273 |
| Germany | 416 | 4.3 | 2211 | 186 | 251 |
| Ireland | 295 | 13.1 | 484 | 28 | 27 |
| Italy | 667 | 94.9 | 1897 | 186 | 215 |
| Sweden | - | - | 127 | 17 | 13 |
| UK | 513 | 30.2 | 1573 | 67 | 310 |
| EU12 | 5284 | 441.5 | - | - | - |
| EU15 | - | - | 14,084 | 1,065 | 1,065 |
| Of which RTD | 1450 | | | 690 | |
| RTD as % total CIP | 24.4 | | | 4.9 | |

*Sources*: European Commission (1996): *First Report on Economic and Social Cohesion*, Table 36; and (1997) *Second European Report on S&T Indicators*, Table 7f.4.

With 99 per cent of funds spent under the CSF and CIP programmes, the Commission retains 1 per cent of the Structural Funds to finance what are known as Innovative Actions. These are studies and pilot projects which, if successful, may be extended to more general initiatives under the CSF or CIP. In the 1994-99 period one of the initiatives focused on innovation for regional and local economic development and enabled the launch of a series of pilot Regional Innovation Strategies (RIS). The concept behind the initiative was that the regional level is the best location for developing plans and programmes relating to local/regional economic development because, at that level, there will be better knowledge of local factors. At the same time DG XII launched its RITTS (Regional Innovation and Technology Transfer Strategies) programme under the 4$^{th}$ Framework Programme's Innovation Initiative. This, unlike the RIS, was not restricted to designated LFR regions.

The two programmes were run in conjunction with each other, with open calls for proposals to interested regions and proposals evaluated by the Commission. Successful applications were co-funded to the tune of 50 per cent on a budget of approximately €500k. The aim was both to provide a framework within which national, regional and community authorities could work together on local/regional issues and to improve the capacity of local actors to play a constructive role in such programmes. There were an increasing number of local/regional authorities who participated in such exercises and, by the late 1990s, feedback was positive. The 1999 Thematic Evaluation of the Structural Funds, for example, concluded:

> "The recently introduced regional planning for innovation and technology transfer is very beneficial for Objective 1 regions because it helps them to modernise institutions, alters informal rules and triggers new thinking. Given the resources offered until now, the impact cannot be much more than that, until linked with implementation mechanisms." (CIRCA, 1999, Vol 1, p66.)

### *6.3 – The two country case studies*

The main purpose of the TSER project studies on regional policy and the operation of the Structural Funds was to study the inter-relationship between the two in relation to policies promoting regeneration. Space does not permit the inclusion in this report of all six case studies.[9] Instead we give below summaries of the two most relevant studies – those on Ireland and Italy. Ireland is included because it went further than any other country to integrate policies developed under the Structural Funds with its general industrial policies and in so doing is generally judged to have made a success of the process. Italy, by contrast, illustrates how easy it is to use large sums of money to little apparent effect.

#### *6.3.1 – Ireland*

Table 6.1 makes it clear that Ireland has received substantial funding from the Structural Funds under Objective 1 (but not under other objectives). The reorganisation of the Structural Funds in the late 1980s had a significant impact on Irish science, technology and innovation policies. While successive reports in the 1970s and early 1980s had urged the Irish government towards a more selective stance on multinational investments, complemented by greater support in universities and technical colleges for basic research and high quality training, the new requirements of the Structural Funds provided what might be called the 'trigger' for actions that had been planned but not implemented.

Specifically, the 1988 framework for the Structural Funds demanded that Ireland establish a broad medium term macro-economic framework, with sub-plans for both industry and science and technology policy. These sub-plans put emphasis on investments in science and technology and on linking industry into these investments. In particular they helped to bring forward a series of initiatives which both underpinned substantial new investments in the science and technology infrastructures (the main emphasis of the 1989-93 phase of developments) and put new emphasis on industrial R&D, especially in indigenous SMEs. They also stimulated the setting up by the Irish government of a management framework which has since been used by the Irish authorities to develop and refine measures to fit specific, but moving, targets – in effect an on-going process of learning and adaptation which in many respects is an exemplar of how best to forge policy.

Two examples serve to illustrate this point.[10] The first is the Programme for Advanced Technologies (PATs). This was conceived in the mid-1980s as a means both of enhancing the R&D capabilities of Irish-owned industry, and also of using the research talents of Irish scientists and technologists, scattered across the country's seven universities and, without investment, liable to leave Ireland for more favourable locations. Policy analysts in the 1980s looked at a number of different models but failed to find one they felt directly applicable to the Irish situation. As a result they created a hybrid – BioResearch Ireland (BRI), set up in 1987. It set up a number of centres in selected universities with the relevant level of

[9] The full set of studies is in Sharp (2001) Part 2 pp 22-65.

[10] The material used in these examples is taken from the Irish country study in the project (Higgins (1999)) and from the detailed case studies on Ireland given in the Thematic Evaluation (CIRCA (1999)). See in particular the coverage of Ireland in Vol II of the Thematic Evaluation.

expertise; funded new laboratories, equipment and staff; commissioned new research from the university, often involving new post-graduate positions, and, jointly with the staff, bid for other projects from industry and the EU. In other words the model was a series of research centres on campus, using (and training) local staff and local post-graduates, bidding for research funds but separately managed and financed.

The BRI model was an immediate success (which is why it became a model), pulling in research funds and expanding within 10 years to five research centres, employing 229 people on 315 contracts worth an annual €10m. As a result of its success further PATs were established in Advanced Manufacturing Technology (1988); Optoelectronics (1989); Software (1989); Materials (1991); Power Electronics (1991); and Telecommunications (1991). In addition, the National Micro-electronics Research Centre (NMRC) originally established in the early 1980s at University College, Cork (and in many respects the pre-cursor of BRI) was also *de facto* incorporated as a PAT.

All PATs were required to earn 50 per cent of their income within five years or face closure. In the course of their (now) 13 year history, not all centres have been successful – indeed of the 26 centres established in different universities, seven have been closed (and four privatised – but this was a sign of success rather than failure). External evaluations have tended to find too little awareness of industrial needs amongst the predominantly academic researchers. But overall they have proved an effective way of both improving Ireland's science and technology capabilities in leading edge technologies *and* of involving industry in those developments and making industry, both indigenous and MNE, aware of the capabilities that exist within Ireland. Within a broader framework, the need to identify potential candidates for PATs has helped stimulate their parent department – the Ministry for Enterprise, Trade and Employment – to develop Foresight procedures to help inform all broad planning procedures.

The second example of CSF influence on Irish policy making relates to measures aimed at boosting industrial R&D. The IDA (Irish Development Agency) had introduced a scheme of support for product and process development as long ago as 1975. It was very popular with SMEs. In 1993, the Ministry of Enterprise, Trade and Employment introduced another scheme, funded by CSF funds, and known as Measure 6 to help finance R&D projects which were not product or process development. In both cases grants were to be repaid if the scheme was profitable, but this was poorly enforced, although in some cases an equity stake was taken in the company and, partly as a result of this measure, by 1995 the IDA held equity in 360 high risk ventures. In 1996 the two schemes were amalgamated into the Industry Research and Development initiative, known as Measure 1. This was financed jointly by the Irish government, the CSF and the companies involved. For grants up to €325k, 50 per cent funding was available, and, for larger sums, 25 per cent funding. The aim of the measure was to bring about a substantial net increase in business R&D in Ireland. Only expenditure directly related to R&D was eligible but in 1997, as part of the mid-term review, the scheme was widened to include technology acquisition where this was relevant to innovation. There was strong demand for Measure 1 support, with 30 per cent of the applications coming from young, small companies including a large number of first time R&D performers. Indeed, Measure I is held partly responsible for the increase in the number of companies undertaking R&D in Ireland from 611 in 1990 to 886 in 1995, with BERD as a percentage of GDP rising from 0.53 per cent in 1990 to 1.02 per cent in 1995 and the number of researchers employed by industry increasing from 1730 to 3770. (The strength of the Irish macro-economy and its

high growth rates has also encouraged companies to undertake the comparatively higher risk R&D investments.)

Both examples illustrate the degree to which the Irish government harnessed the CSF frameworks to pursue goals, and mechanisms for achieving those goals, which they had already identified. Nevertheless, the impact of the CSF frameworks themselves has been considerable, both in stimulating new approaches and, perhaps above all, in encouraging policy learning through the process of careful and consistent evaluation and monitoring.

In its evaluation of the comparative experience of Objective 1 countries in promoting RTD, the group led by Circa Consultants find much to praise in the Irish experience. In their summary tabulation of gains to Community Added Value, they identify five categories of impact from the CSF – catalytic (ie, stimulating new actions); innovative (introducing novel policy initiatives); enhancement (adding to capabilities); cohesion (closing the gap between richest and poorest); and integrative (promoting European integration). Under these heads, they sum up Irish experience as follows (CIRCA, 1999, p127):

**Table 6.4: The Impact of Structural Funds on Irish RTD policy**

| | | |
|---|---|---|
| *Catalytic* | (i) | encouraged process of continuous improvement and refocusing of policy based on learning from experience; |
| | (ii) | effected switch of emphasis from infrastructure and capacity development of 1989-93 to improving performance SMEs, especially indigenous SMEs and first time R&D performers; |
| | (iii) | also encouraged switch of support for universities from applied to basic research needed to support advanced skill requirements. |
| *Innovative* | (i) | "singularly responsible" for establishment of PATs "most innovative and significant initiative of Irish Funds". |
| | (ii) | responsible in 1997-99 period for establishment of ten new Technology Centres at Institutes of Technology. |
| *Enhancement* | (i) | Measure 1 has "significantly assisted" innovation in SMEs and achieved "high levels of satisfaction" with way it operates. |
| *Cohesion* | (i) | convergence is evident in BERD figures (but not GOVERD where Ireland performs poorly). 91 per cent of RTDI support from funds is to support industrial research or co-operation. |
| *Integrative* | (i) | helped to promote a more coherent and integrated approach to RTDI. |
| | (ii) | "institutional arrangements" for management and monitoring have proved flexible and dynamic. |
| | (iii) | agency management (ie, separation of policy and implementation) of projects has been "one of strong points" of Irish system. |

*Source*: CIRCA, 1999, p127.

*6.3.2 – Italy*

As Table 6.2 illustrates, of the six countries in the study, Italy has received more in Structural Funds than any other.[11] Up to 1999, eight Italian regions[12] covering 37 per cent of the Italian population were classified as Objective 1 regions and Italy has received the bulk of its funding from the Structural Funds for this Objective. Of the €8.9bn received from the Structural Funds in the period 1989-93, €518m or 5.6 per cent were devoted to RTD and innovation, while for the period 1994-9 €16.3bn were committed to Structural Fund activities of which 7 per cent or €1,148m were allocated to RTD objectives.

The Italian country study gives greater detail on these expenditures (Braga, Cini and Braga, Cini and Gambardella, 1999, pp125-44) showing the breakdown between regions and programmes. As is made clear, the majority of the investments in the earlier phase (89-93) went mostly into the development of scientific and technological networks and their related infrastructures in the Mezzogiorno, objectives which were the explicit goals of the negotiated (and agreed) multi-regional CSF programme. This defined as priority goals the development of these networks (extending the reach of the Italian CNR and other public research organisations such as ENEA), promoting specific research programmes in areas such as transportation, energy, environment and education. The programme also mentioned the promotion of science and technology parks. In practice the money was almost wholly spent on the development of public research institutions and science and technology parks with very little action in favour of firms. The local plans also showed a bias in favour of public sector institutions. This bias was specifically addressed in the commitments for the second period, with much greater emphasis being put on industrial research and technology transfer, the latter linking with the Ministry for Universities, Research and Science and Technology (MURST) attempts in the 1990s to give new impetus to the research and innovation activities under Law No 46. In both periods, however, the failure of the regions to manage the funds at their disposal was noted, with projected programmes and initiatives often failing in practice to materialise.

Italy's receipts under other Structural Fund objectives have been much smaller than under Objective 1. The Italian study notes the substantial sums going to Piedmont under Objective 2, with a good share of this being devoted to action under the head of 'technological innovation and R&D' (Braga, Cini and Gambardella, 1999, p131). Italy has also received considerable funding under objectives 3 and 4 (not regionalised) and has devoted much of it to promoting human capital. In particular the ESF (European Social Fund) has been instrumental in helping the Italian government upgrade professional education for young Italians. As the study notes "The main achievement of the period (89-94) was a significant increase in the supply of professional education courses, both in the Mezzogiorno and other regions of the country" (Braga, Cini and Gambardella, 1999, p137), but it also noted that the percentage of funds spent under Objectives 3 and 4 in Italy as a whole was only 65 per cent, and under regional initiatives, 58 per cent. This was set to change through the later period, with the Ministry of Labour co-operating with MURST to mastermind a series of multi-regional and regional plans to promote new activities, with much attention being given to professional education including entrepreneurship. Nevertheless, as the Italian study notes, after 45 per cent of the time between January 1994 and December 1999 had passed, by March 1996, only 21 per cent of the projected initiatives had been approved, and a mere 11 per cent

[11] Ireland, one of the four cohesion countries with its whole area designated Objective 1, in fact received considerably more funding per head of population – €262 per head for the 1994-99 period compared to Italy's €117 per head (see Table 34 CEC 1996).

[12] After 1.1.2000 Abruzzo was no longer classified as Objective 1.

launched, with, on this occasion, the multi-regional initiatives lagging. Once again this evidence raises questions over the ability of the Italian authorities to deliver on their promises. It is all very well setting up planning mechanisms through the CSF and regional frameworks, but implementation requires also the administrative capabilities to put plans into action.

These criticisms are echoed in the recently completed thematic evaluation of the impact of the Structural Funds on RTD in Objective 1 and Objective 6 regions (CIRCA, 1999). It notes (pp89-90) the reinforcement of the public research centres and the establishment of the science and technology parks, but it also notes the low level of participation from private firms and the 'virtual' nature of a number of initiatives waiting for government action. It comments as follows:

> "These research centres are now at a stage where they have to prove and improve their value to regional industry. The investments in technology parks are generally recognised as a failure … Most parks lack linkage with the regional economic fabric and attract little interest from local companies to settle in the facilities. Finally in the Mezzogiorno, one feels the lack of sector-oriented R&D/technology centres (eg, centres supporting the regional good, textile industry, etc). This points to an important gap in the regional public research system" (CIRCA, 1999, p94).

As in the Italian case study in this project (Braga, Cini and Gambardella, 1999), the finger is pointed to failures in management and implementation:

> "At the national level, two aspects seem to be important. Firstly, Italy lacks an organisation dedicated to policy delivery. … Secondly, the legal system was not suited for proper fund management. On the regional level, many of the Italian regions lack the expertise or the resources for proper fund management. Finally, in Italy, there is a lack of co-ordination between national and regional programmes" (CIRCA, 1999, p100).

The Thematic Evaluation has little good to say of Italian experience in relation to overall Community added value. Summing up the impacts under the heads catalytic, innovative, enhancement, cohesion and integrative, it finds few positive elements. "It is difficult to find evidence that the Funds have had any catalytic impacts"; "Italian regions have not innovated or undertaken new or risky initiatives. Neither has the POM (the multi-regional national programme)"; "Public research capacity has been enhanced at a rate and pace, and on a scale, which could not have been contemplated with national funds … This is the main 'additionality' of the Funds in Italy." "There is little or no evidence to show that the Funds have led to any significant reductions in regional disparities either in technology or the economy". "There are some positive indicators [for integrative effects]. There is evidence of regional planning for RTDI … But there are still major problems of co-ordination …" (CIRCA, 1999, p129).

The Italian country study in this project was kinder than the Thematic Evaluation. It concludes:

> "The Italian regional administrations are gradually learning about how to deal with their increasing powers and functions, particularly in industrial and technology policy, and they are learning how to manage the increased availability of resources coming

> from the European Structural Funds. … The situation has improved during the second programming period, 1994-99, even though there are still ample margins for further improvements. Moreover, in this period, one observes a better co-ordination in the use and management of these funds, between the regional governments, the central government and the EU" (Braga, Cini and Gambardella, 1999, p155).

The report contains a warning, however, about regional variations in administrations, pointing out that this can exacerbate the cohesion problem.

> "More advanced administrations are typically endowed with more effective administrations, and this may make them better able to utilise their new powers and resources to enhance local economic development. An active role by central government and by the EU in helping, supervising and evaluating policy activities of the Regions is then critical to avoid this leading to increased socio-economic gaps" (Braga, Cini and Gambardella, 1999, p155).

The authors advocate the setting up in Italy of something equivalent to the French Ecole Nationale d'Administration (ENA) to provide high level professional education for public administrators, using the resources of the European Social Fund, whose current programmes, while increasing the supply of professional education courses, they find "very traditional and undifferentiated … our impression is that the large increase in the availability of public resources for professional education has created a new 'sector' of consultants, university professors and experts of various sorts who perform these activities in their spare time". The result is not only poor quality professional training but undue fragmentation of courses and course arrangements. They advocate instead a corps of full-time professional experts, seconded for 2-3 years from their organisations, to set up proper professional training institutions.

Overall, therefore, one is left with real doubts as to how effectively the Structural Funds are being used in Italy. That they have caused both central and regional administrations in the Italian government to think carefully about the role of RTD and innovation in regional development is certainly true, and that they have forced them to develop their ideas within the context of broader multi-regional (POMs) and regional plans (POPs) is again true. It is not clear, however, that the Italian authorities, especially at the regional level, yet have the ability to move beyond the planning stage to implement their plans in practice on the ground. Until they can achieve this, resources alone will achieve little. This is a good example of the need to develop institutions alongside policies. The failure in this case to develop the appropriate institutions at the regional level to implement policy has severely constrained the effectiveness of EU initiatives.

### *6.4 – Conclusions*

The purpose of this section was to consider the development of the EU's Structural Funds and their inter-relationship with national regional policies with a view to identifying lessons which might be applied by the CEECs. While providing an overview of the emergence of the Structural Funds, we have chosen to limit detailed consideration of the inter-action with national policies to two countries – Ireland and Italy – partly because amongst the six countries examined in the TSER study they were the only ones to receive substantial Objective 1 funding, but also because, between them, they illustrate well both how best to integrate policy at the different levels of government.

There are advantages also in highlighting the Irish experience in relation to the CEECs. Of the six countries in the TSER study, only Ireland could be classed as a developmental economy where the slate of pre-existing science, technology and industrial policies was clean and government was forging new policies at the same time as the Structural Funds were making their impact. Irish policies and policy making was in this respect much more open to influence than those of other countries. Moreover, with a population of only 3.6 million its experience is relevant both for regions and for the smaller countries among the CEECs.

What lessons then to be learned from this experience:

1. First and foremost, as far as regional policy is concerned, the message has to be that the *Structural Funds are now 'the main game in town'*. While national policies co-exist with EU policies and present a diverse range of policy instrument, the big money comes from Objective 1 status and the main decisions on this are taken not at national level but in Brussels. National governments are party to the decision taking in Brussels and need to co-finance Brussels expenditures. A sympathetic national government is therefore important. Indeed, national governments may add considerably to the funds available from Brussels, but willingness to co-operate with Brussels procedures, to help provide the infrastructure necessary for their implementation and the back-up and determination to see policies through is arguably more valuable than resources.

2. In this respect *complementarity of policies is also an important issue*. The ideal is to have Brussels, national and regional policies all aligned and pushing in the same direction. In this respect, the insistence from Brussels that monies allocated under Objective 1 require spending within an overall strategic framework helps to provide an axis for alignment and the experience of Ireland illustrates the benefits that can stem from such an approach.

3. There is still *too much linear thinking dominating policy making* on science and technology. For example, for too long policy has been dominated by the view that the technology gap is a straightforward matter of linkage – establish mechanisms (eg, science parks) to link academic research and industry and the problem is solved. Experience shows clearly that this is not so – witness the poor performance of the Italian technology parks described in this study. National governments, having long spurned DG XVI initiatives to establish regional innovation strategies, which aim to look at the issue systemically and link the different players into the system, are now beginning to look at those approaches more sympathetically.

4. National governments are also increasingly aware of the *need not just to expand the infrastructures of R&D, but to address the demand-side issues*. They recognise that it is of little use strengthening RTD facilities in terms of public sector laboratories and universities, if there is no linkage to the demand side. The key issue here is SMEs. Multinational companies can access the facilities they need on a worldwide basis. Competitiveness for the local supply chain depends on local SMEs and here the key issue is not the formal science parks, but the informal networks and linkages. Firms learn best from each other. This is why local networks, such as those around a German chamber of commerce, are so important and it is from such networks and clusters that externalities emerge.

5. In relation to the regions themselves, *regional policy is in part about autonomy and the degree to which regional/local government can make policy for themselves* and raise resources to implement policy. Those regions which have shown themselves to be the more dynamic (and here Ireland might be seen as the equivalent of a region) have in general enjoyed a good deal of autonomy to experiment with new approaches and new ideas. Nevertheless, while it helps to be able to 'do your own thing' autonomy does not in itself guarantee success.

6. There is also increasing recognition that, for example, *innovation and SMEs are both issues better dealt with at a regional rather than a national (let alone an EU) level*. The key issue is the development of support networks, ideally linking the firms themselves into the educational/research structures at the local/regional level. As suggested above, this is better achieved when people know each other and share community frameworks than imposed top-down.

7. Last but not least is the message that *institutions and people matter*. One of the reasons for Ireland's success has been the quality of its civil service and the ability of its administrators to learn from experience. This contrasts with Italy where initiatives have foundered on implementation, or more accurately, on lack of implementation. Fast growing, dynamic regions attract high quality administrators whereas dynamic young people flee from slow growing declining regions. To reverse the situation, it is necessary to find some way of reversing the flows.

**References**

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Sharp 1999 – UK study
Braga, Cini and Gambardella 1999 – Italy country study
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EC 1997 – 2nd S&T Indicators – Synthesis report
EC 1999 – Sharp 2001, Thematic study (structural funds)
EC 1997b – Sharp, thematic study
EC 1996 – first cohesion report – full ref in Sharp 2001 thematic study
CIRCA 1999 – thematic evaluation by CIRCA – sharp 2001 thematic study
ESRI 1997 – Higgins 1999, p49
CEC 1996 – Sharp 2001 – thematic study

# Section 7 – Science, Technology and the Framework Programmes

## *7.1 – General overview of the emergence of EU Framework Programmes*

The story of the emergence of the EU's Framework Programmes as the mainstay of the EU's RTD efforts is now well known (see Guzzetti, 1995 and Peterson and Sharp, 1998). While the Treaty of Rome made no mention of science or technology, mainly because in the 1950s it had been assumed that all new technologies would revolve around nuclear physics whose interests were looked to in the Euratom Treaty, by the early 1980s it was clear that the EU needed to provide some lead to prevent the development of a highly competitive and self-destructive form of techno-nationalism from taking hold of member states in fields such as electronics. The ESPRIT programme, introduced in 1982, was the first of a series of collaborative programmes in pre-competitive areas of new technologies (mainly electronics, telecommunications, new materials, and biotechnology) whose essence was to secure the sharing of knowledge and experience through partnership and collaboration between universities, research institutes and firms in the different member states. These initiatives were contained within a broader 'Framework ' Programme which brought together other elements of expenditure (eg, the remnants of the Euratom nuclear energy programme) and provided a five year forward strategy for European Research and Technological Development (RTD).

There has now been two decades of experience with the Framework Programme. Tables 7.1 and 7.2 below summarise the main features of those 20 years. In expenditure terms the programme grew fast in its first 10 years, but in terms of annual spend has in real terms remained static since 1992. Energy which, thanks to the Euratom spend, dominated the first programme (1984-87) rapidly gave way to ICT, but spending in this area peaked in the early 1990s, with life sciences and the environment becoming the main growth fields. The total annual expenditure at €3bn by the late 1990s amounts, however, to only 3.5 per cent of the total EU budget, approximately 4 per cent of total member-state government expenditures on R&D and (considerably) less than 2 per cent of total member state spending on R&D as a whole. In other words, the total amount spent under the Framework programmes is, and remains, marginal in relation to total science and technology spending by national governments and the private sector.

The question to be answered is what impact, if any, have these programmes had on national RTD efforts and what lessons are there to be learned by the CEECs from the first 20 years of experience with these programmes? Table 7.3 below gives more detail for the five countries covered in detail by the TSER study Science, Technology and Broad Industrial Policy. (Since the study relates to the years 1975-1997 and Sweden only joined the EU in 1995, it is excluded.) This shows that on a per capita basis, Ireland was receiving proportionately more than any of the other five countries. Germany did least well on the amount spent per R&D scientist, reflecting the larger number of R&D scientists employed in German industry. The UK comes out close to the EU average, whereas Italy does badly on all counts. Indeed, while Ireland is the obvious 'gainer' from these programmes, Italy appears the loser, mainly because of its relatively low participation rate in these programmes.

## Table 7.1: RTD priorities and the Framework Programmes

| Framework programme | I | II | III | IV | V |
|---|---|---|---|---|---|
| Years | 1984-7 | 1987-91 | 1990-4 | 1994-8 | 1998-2002 |
| Total million ECUs (adjusted to 1992 prices) | 3,750 | 5,396 | 6,600 | 13,100 | 14,500 |
| | | | *Priorities (%)* | | |
| ICT[a] | 25 | 42 | 38 | 28 | 24 |
| Industrial Technologies[b] | 11 | 16 | 15 | 16 | 17 |
| Environment | 7 | 6 | 9 | 9 | 10 |
| Life Sciences | 5 | 7 | 10 | 13 | 16 |
| Energy | 50 | 22 | 16 | 18 | 22 |
| Other[c] | 2 | 7 | 12 | 14 | 14 |
| Total | 100 | 100 | 100 | 100 | 100 |

a Information and Communications Technologies
b Includes industrial processes and new materials
c Includes human capital and mobility, development, diffusion and exploitation and social economic research.

*Source*: Peterson and Sharp, 1998, Table 1.2 updated to take account of Fifth Framework Programme.

## Table 7.2: EU commitment to RTD 1984-98

| | EU RTD spending MECU (1992) | EU RTD spending as % EU budget | EU RTD spending as % of member states total RTD spending (public and private) | EU RTD spending as % of member states' government spending on R&D |
|---|---|---|---|---|
| 1984 | 848.4 | 2.1 | 0.5 | 1.1 |
| 1988 | 1,373.9 | 2.6 | 1.1 | 2.3 |
| 1990 | 1,946.9 | 3.9 | 1.2 | 2.7 |
| 1992 | 2,842.3 | 3.3 | 1.5 | 3.3 |
| 1994 | 2,637.3 | 4.2 | 1.7 | 3.8 |
| 1996[a] | 3,066.0 | 3.8 | 1.7 | 3.9 |
| 1998[a] | 2,800.9 | 3.5 | n/a | n/a |

n/a – not available
a Projected.

*Source*: Peterson and Sharp (1998), Table 1.3.

## Table 7.3: Country receipts from shared cost programmes within Framework programmes on a per capita, per employee and per R&D employee basis (EU average = 100)

| | Per capita | | Per employee | | Per R&D employee | |
|---|---|---|---|---|---|---|
| | *FP II 1987-90* | *FP III 1991-94* | *FP II 1987-90* | *FP III 1991-94* | *FP II 1987-90* | *FP III 1991-94* |
| Germany | 117 | 88 | 103 | 81 | 69 | 59 |
| France | 140 | 123 | 140 | 126 | 108 | 99 |
| UK | 111 | 108 | 93 | 98 | 92 | 97 |
| Italy | 55 | 63 | 57 | 72 | 88 | 109 |
| Ireland | 171 | 182 | 192 | 213 | 343 | 311 |
| EU12 | 100 | 100 | 100 | 100 | 100 | 100 |

*Source*: European Commission Services

Table 7.4 shows the number of participations by country. As is clear, France, Germany and the UK vie with each other to be the most active player. For FPII (1987-90) France was the most active player; for FP III, the UK exceeded French efforts; for FP IV Germany moves into the lead. Given that its population is very close to that of the UK and France, Italian participation rates are disappointing, although improving. Sweden, allowed to participate for the first time in FPIII (although paying its own way) had established itself as a central player by FP IV. Ireland, with a population of only 3.5 million (compared to Sweden 8 million, the UK, France and Italy all at 55-60 million and Germany now 80 million) is an active participant from the outset, although its links, especially in the early programmes, have been particularly with the UK.

**Table 7.4: Total participations in FPs II, III and IV***

| | **II 1987-90** | **III 1991-94** | **IV* 1994-98** |
|---|---|---|---|
| Germany | 2,130 | 3,140 | 3,287 |
| France | 2,603 | 3,160 | 3,220 |
| UK | 2,423 | 3,357 | 3,244 |
| Italy | 1,385 | 1,948 | 2,291 |
| Sweden | - | 473 | 1,017 |
| Ireland | 346 | 441 | 428 |

*Shared cost actions only. For FPIV period 1994-96 only

*Source*: European Commission (1994), p 240; (1997), p549.

Variations between countries in the structure of funding illustrate the variations in institutional make-up of research systems between countries. In Germany, France and Italy research centres play a more important role than universities in research, whereas in the UK, Ireland and Sweden the reverse is true. Big firms dominate industrial participations in Germany, France and the UK (for FP II and III: there was an interesting shift in FPIV reflecting perhaps the run-down of large firms in the UK in the 1990s). By contrast Ireland and Italy both show a substantial presence from small firms.

A wide ranging evaluation taking a broad view of the benefits to the EU of the successive Framework Programmes was undertaken in 1997 under the chairmanship of Vicomte Davignon, who had, in 1982, been one of the founding fathers of the programme. The Davignon Committee's conclusions were that, while the FPs had fulfilled a useful function across national and institutional boundaries, insufficient emphasis had been placed on 'added value' – the advantages to be gained from operating at an EU rather than a national level. In particular it emphasised the benefits gained from collaboration in relation to large facilities; from sharing ideas in new inter-disciplinary areas of research such as genomics, and from the development of technical standards, such as the GSM standard for mobile phones which emerged from European collaborations. It pointed to the value of reinforcing scientific excellence through such programmes, suggesting that the EU might do more in the FPs to promote basic science, but it also called for greater 'coherence' between areas of research and areas where the EU took the policy lead, such as the environment, transport and food standards. Although published at the end of 1997, the criticisms of the Davignon report were too late to have much impact on the Fifth Framework Programme, which came into effect in 1998, but their influence can be seen in the current (2002) negotiations over the Sixth

Framework Programme which promises to be fairly radical in its restructuring of the Programme.

In addition to the broad evaluation undertaken by the Davignon Committee, in the early 1990s a series of studies were conducted on a country by country basis to measure the impact of the EU RTD policies at a national level. Table 7.5 lists the results from nine countries where a set of reasonably comparable studies were undertaken. It highlights the degree to which acquiring new research and scientific skills and new links with other R&D organisations were the highest rated benefits. It is noteworthy that the countries that were the most active participants, France, Germany and Ireland in this case, were also the countries registering the highest consensus about benefits.

**Table 7.5 Major benefits from involvement in EU R&D contracts – Framework II Impact Studies (%)**

| Country | New scientific skills | Research skills | Training content | Link with other R&D organisations | Initiation of joint projects |
|---|---|---|---|---|---|
| Belgium* | 52 | 37 | 21 | 46 | 41 |
| Denmark | 37 | 19 | 11 | 16 | 15 |
| France | 82 | 29 | 39 | 62** | 68 |
| Germany* | 91 | 92 | n/a | 93 | 64 |
| Greece | 26 | 22 | 13 | 20 | 17 |
| Ireland* | 75 | 62 | 31 | 68 | 48 |
| Italy | 28 | 34 | 1 | 29 | 6 |
| Portugal* | 87 | 56 | 61 | 64 | 44 |
| Spain | 17 | 23 | 18 | 25 | 15 |

*Multiple answers allowed
**Refers to 'new and durable' collaborations

*Source*: European Commission (1994): Table 8c.2

### *7.2 – Impact on different countries*

Evaluations based on country by country experience are also valuable in casting light on the process of assimilation, namely how different countries aligned the emerging new set of policies being forged by the Commission with their own existing policy agenda. It is these experiences as well as the broader lessons that are relevant to the CEECs. Details are to be found in Part 3 of the *Cross-Cutting Study: the interrelationships between EU and National Policies* (Sharp, 2001) entitled *The Impact of EU RTD Programmes.* Below we summarise the results for each of the six countries involved in this set of studies.

#### *7.2.1 – France*

The French impact study (Laredo *et al*, 1995) which concentrated on the impact of FP II (1987-91) emphasised the degree to which even at that early date the Community programmes had penetrated the French research system. Two thirds of the public laboratories and major research universities in France were involved in participating in collaborative projects; over 200 large firms were likewise involved, with the country's 20 largest firms each involved in an average of 2.7 participations. In addition over 400 small and medium sized firms (SMEs) were participating including a large number of France's new technology-

based small firms. Indeed the authors summed up their findings by saying "Le système national est largement pénétré par les programmes communautaires" (Laredo *et al*, 1995, pv) and then later "On est frappé une fois de plus par le petit nombre de mentions négatives exprimées".

Amongst large and small firms the acquisition of technical and scientific skills topped the bill in terms of direct benefits, while links with other firms and universities were also highly valued. For the public sector establishments, the acquisition of new scientific skills was the dominant benefit, but the training benefit was also recognised as significant, as was the opening up of new routes to collaboration. This underlines the second major conclusion of the authors, namely that by the 1990s collaboration had become an important way of life for those engaged in research activities whether working in the public or private sector (*ibid*, p vii).

A parallel study (Gusmao, 1996) goes further and, noting the fact that many collaborations were built upon earlier linkages, suggests that in fact FP II saw a substantial deepening of such links with the opening up of European networks complementing the strengthening of the pre-existing French networks. Gusmao rejects suggestions that the French authorities had allowed the Commission to take over the direction of national (ie, French) R&D policy. On the contrary she suggests that the bias towards sectoral but decentralised policies represented "le style français" of conducting Community business. Her overall conclusion was that by the mid-1990s national and Community efforts were indissolubly linked – "les deux semblent aller 'de pair' dans la même direction" (Gusmao, 1996, p113).

All in all, therefore, one can conclude that for the French participation in the Framework Programmes has been a positive experience, with both public and private sectors benefiting from new routes to collaboration and access to wider horizons. Equally, in many respects the ideas underlying the development of the Framework Programme, even indeed the concept of a single framework (the French use the work 'envelope') for action, represented a French way of doing things and they therefore found it easier than some other countries to adapt national programmes to work alongside Community programmes.

*7.2.2 – Germany*

Germany was slow in the 1980s to take up the new opportunities offered by the Framework Programmes. Although the largest member of the Community in terms of population it recorded a lower number of participations in FP II and III than either France or the UK. Only in FP IV (1994-1998) did Germany begin to pull its weight in terms of the number of participations. This relatively slow build up reflected some genuine doubts on the part of German decision-makers in the science and technology fields about the role of the European programmes. There were a number of criticisms – perennially the slow process of decision making and the high cost of proposal writing, but Germany's scientific community were above all sceptical of the degree to which politics influenced decision making. In particular post-Maastricht when 'cohesion' became an explicit policy objective they were worried that the programme had departed from the original intention of making scientific excellence the prime criterion for selection.

Nevertheless, those who did participate were usually pleased with the outcome. The German Impact study (Reger and Kulhmann, 1995) showed both industrial and academic participants rating the experience of collaboration as the most important outcome with firms claiming that it enhanced product quality and introduced them to new areas of R&D while the universities

and research institutes rated the enhanced skills gained as their top benefit. In considering the relationship between Federal, Länder and EU programmes the study notes that there had been "an evolving (informal) division of tasks" which "although tentative and lacking in stability" has nevertheless "been mainly accepted by the actors involved". (Reger and Kuhlmann, 1996, p178). This division of tasks was defined as being, for the EU, concentration on trans-national research tasks (development of expert knowledge systems; co-operation over high cost projects such as the genome project; collaboration on standards and norms); for the Federal Government concentration on supporting basic research and technology; and for the Länder governments, concentration on supporting higher education and the innovative capabilities of industry. Two main criticisms emerged. First, the degree to which the EU programmes undermined the "tried and tested principles and mechanisms of self-organisation in German science" (ie, excellence judged through peer review). Secondly, the Länder governments worried about the overlap between their responsibilities and Brussels in relation to support for innovation in SMEs.

Overall it is fair to say that the emergence of the EU programmes had evoked somewhat mixed reactions in Germany. On the one hand they were perceived as marginal, and in this respect neither Federal nor Länder governments have been deflected by the emergence of EU policies from pursuing other policies they saw as being appropriate. (In this respect, as Reger and Kulhmann note, EU competition and state aids policy have had a far greater impact (*ibid* p178).) On the other, especially in the 1990s as knowledge of the programmes expanded and more firms, universities and research institutes began to participate, there has been a greater appreciation of their role in stimulating and facilitating trans-national co-operations, but at the same time growing reservations about their limitations. Gains in terms of improved scientific skills and competencies gained from international collaboration are acknowledged. Equally, reservations about the centralisation of decision-making procedures in Brussels and the legitimacy and transparency of its processes remain.

*7.2.3 – Ireland*

Ireland has been an active participant in the Framework Programmes recording twice the number of participations that would be expected for its size (3.5 million population). Much of this activity has involved the university and small firm sector, although the increasing presence of large multinational subsidiaries has seen a rise in large firm participation in FPs IV and V compared to the earlier programmes. Moreover, as the per capita figures in Table 7.3 show, receipts for Ireland from the Framework Programme were also well above average amounting to some 10 per cent of government spending on R&D and amounting in the mid 1990s to some €50m a year.

But while receipts from the Framework Programme were a useful supplement to government spending on R&D, they were dwarfed by the funds coming to Ireland in the 1980s and 1990s from the CSF Structural Funds. As a 'cohesion' country whose GDP per capita was then well below the Community average, Ireland received some €1000m between 1989 and 1999 of which some 5 per cent (€200m) was devoted explicitly to RTD and some 44 per cent to human resource development, proportionately many times more than was devoted to such expenditures by any other EU country in receipt of Structural Fund monies. (Higgins, 1999, p21). In other words while the Framework programme injected some €50m into Irish RTD expenditures each year, the CSF was injecting an additional €150m. And it was this injection of funds which enabled the Irish economy over this period to upgrade its science and technology infrastructure and capabilities to levels expected of a modern economy. The role of the Framework Programmes in this regard has been to provide an avenue for international

co-operation and exchange which has enabled Irish scientists and engineers to gain experience of working alongside some of Europe's leading scholars. Higgins, in his study of the Irish RTD experience over this period, concludes:

> "The increased market orientation of Irish universities is another related factor [contributing to Ireland's transformation in the 1990s]. The universities had to turn to Brussels for funding because there was very little support available for research in Ireland. This exposed them to new developments, not least orientation towards industry. Today the universities are dynamic, innovative and competitive."
>
> (Higgins, 1999, p48)

The Irish Impact Study was undertaken by Deloitte and Touche Management Consultants (Deloitte and Touche, 1993) and is now badly out of date. As with the other impact studies it shows the main benefits from participation in the Framework Programmes to be access to new scientific skills and knowledge. Interestingly it was the private sector (at that time predominantly SMEs) that gave the higher rating to the benefits – 80 per cent of the private sector laboratories rated the results 'very important' compared to a 57 per cent rating from the public sector laboratories. This suggests that for the small research based firm in Ireland the Framework Programme did indeed provide a vital conduit into the world of international science.

Has the development of the Framework Programmes had any significant influence on Irish policy towards science and technology? In general the answer is "Not a significant impact", for, as indicated, developments in the CSF Structural Funds, and particularly the reforms of 1989, have been a more important influence on Irish policy. Nevertheless it is possible to identify two areas where the Framework Programmes have had influence. One is in terms of promoting international co-operation. By definition, Ireland can contribute only a very small proportion to the world's scientific output. If it is going to access that output, it must have scientists who can 'plug in' to leading edge research. The Framework Programmes have provided a mechanism for such linkages, enabling Irish scientists to work in and experience life in some of the leading research laboratories in Europe. The second area is in the promotion of university/industry links. Exposure to developments in international science led to a distinct shift on the part of the Irish government away from the old academic divide of basic and applied science and towards an integration of the two. The considerable success of their Programme of Advanced Technologies (PAT) and its pilot, Bio-Response Ireland, illustrate well how successfully applied and basic research can evolve side by side.

It is worth noting one further aspect of the PAT – it was conceived in response to the requirement under the 1989 reforms of the CSF Structural Funds that Objective 1 aid is given within the framework of an overall strategic plan. As noted in the section in this paper on regional policy and the structural funds, this requirement meant that for both private and public sectors in Ireland the government provided a clear 'vision' of how it wanted the economy to develop. This element of indicative planning was critical in securing one of the most valuable elements in the Irish experience – the convergence of policy thinking. The Irish government explicitly used the Framework Programmes as a tool of policy, alongside others, to help enhance Irish science and technology capabilities. But it was not expected to work by itself – it was helped and reinforced by both national policy (in particular the investment in education and its emphasis on upgrading science and technology in schools and universities) and the Community Structural Funds.

*7.2.4 – Italy*

It is widely acknowledged that Italy has under performed within the Framework Programmes. With a population approximately the same size as that of France and the UK (17 per cent of EU population), it has attracted only 10-11 per cent of funding in successive Framework programmes, whereas France and the UK have secured approximately 20 per cent. Its participation rates have been low (Table 7.4) and its per capita receipts (Table 7.3) half the average. What Table 7.3 also reveals, however, is that receipts per R&D employee are much closer to the average – indeed for FP III they were above average. This statistic neatly points to Italy's problem – it is not so much that it did not receive it 'fair share' of funding under the Framework Programmes, as that its own capabilities are limited and it needs to build up both its R&D capabilities and its participation rates in the Framework Programmes.

The Italian Impact Study (BGP Consulting Progretti, 1993) revealed that, as with other countries, the main benefits derived from participation were perceived to be access to new scientific knowledge and skills and links with other European groups. In view of the low participation rates, it was surprising to find a very positive view of outcomes. Ninety-eight per cent of large firms participating in the Programmes from Italy rated the outcomes as either important or very important, 93 per cent of SMEs thought likewise; and 90 per cent of research centre/university groups also recorded these positive views.

Given these very positive ratings, it was surprising that participation was so low. This issue is discussed at some length in the Italian Impact Study (*ibid* pp41-56) in terms that echo the criticisms of the Italian system made in the study by Braga, Cini and Gambardella *et al* (1999). The Italian system (of the early 1990s) was seen to be a "pork barrel system" in which patronage stretches wide and public subsidies were expected to be divided between many "interested parties". Porter (1990, p448), for example, described the Italian system as being one in which "much government aid is funnelled not into factor creation, but into rescues, subsidies and promoting the development of the South." This led to high overheads and little incentive to develop the science and technology system. The Impact Study quotes Peter Aldous, writing in *Science* (Vol 256, 24 April 1992, p472) as follows: "With no tradition of strict peer review of grant proposals, no recognisable network of post-doctoral positions and constant interference from Italy's political parties to contend with, most Italian researchers are not optimistic about dragging Italian science up to the level of its European neighbours any time soon."

Even as he was writing things were beginning to change because the EU programmes provided both a culture shock and a learning experience for the Italians. Their failure rate in peer review processes provided the shock: experience of working alongside German, British and French researchers woke them up to what was needed if they were to make the most of the opportunities offered. Indeed in this regard the Framework Programmes also provided the catalyst for change for the Italian system. The Impact Study sums it up: "Where no other institution had achieved, in decades of inane effort to modify behaviour and impose rules, the two EC Framework Programs succeeded, in ten years, in convincing the Italian S&T community to accept guidelines and stick to rules" (BGP Consulting Progretti, 1993, p173).

What the Italians learned from the Framework Programmes was the need for RTD programmes to be organised with:

- a clear procedure for identifying priorities and allocating research resources according to these priorities;
- a system of international peer review which give credibility to the decisions taken;

an on-going system of monitoring and evaluation;
a budget allowing a 2-5 per cent margin for management and administration.

The outcome was the establishment of a new ministry – the Ministry for Universities, Research, Science and Technology (MURST). This combined responsibility for science and technology with that for the university sector. It also assumed responsibility for the national research organisation (CNR) and all its constituent laboratories, and, for the first time, the setting of clear national priorities for the research sector. Last, but not least it set about re-organising of the university sector. (For a full description of these reforms see Braga, Cini and Gambardella, 1999.) One outcome has been a substantially increased participation rate from Italy in FPs IV and V, although in other respects (investment in R&D as % GDP, patenting; numbers of scientists and engineers per 1000 population) Italy still has much catching up to be done.

7.2.5 – Sweden

As a new member of the EU in 1995, Sweden did not play a formative role in the Framework Programmes until the mid-1990s. While participation had been possible at their own expense in FPs II and III, Sweden did not assume full participation until FP IV, but since that time it has become an active participant. The result of this late entry is that the Impact Studies undertaken for Sweden (NUTEK, 1998 and 2000) reflect this later experience. They also reflect the impact on a new member, albeit one with considerable capabilities in science and technology. As such the experience is perhaps particularly relevant for the CEECs.

The first NUTEK impact study (NUTEK, 1998) looked at the benefits secured from participation in the Framework Programmes. This revealed that the universities and academic institutions in Sweden put particularly high value on participation. As in other countries, the main benefits from participation were access to new knowledge, skills and contacts, but the FPs were particularly valued because the projects were in general bigger, covering a wider area of research and involving more partners than other collaborative projects with which they (the participants) had been involved. Participation often also acted as a catalyst, paving the way for expansion into new areas of research. One interesting feature of the NUTEK study was a differentiation between the position of initiators/co-ordinators and other partners in projects, with those who were in a co-ordinating role perceiving greater gain from participation than others. As far as companies were concerned, the main benefits were gained from the linkages with other participants; especially valued were links with major foreign universities. Collaborations usually involved links with at least some partners with whom participants had collaborated before but the EU programmes extended collaborations and brought in new partners.

A second NUTEK study looked in particular at the strategies adopted by some of Sweden's largest MNEs towards the Framework Programme (NUTEK, 2000). Those interviewed represented the central R&D units within the firms. While most did not rate participation as of strategic importance, they rated it of importance to their future technological activities. The most common finding was that participation led to new R&D contacts and new partners who had competencies and technologies the unit itself lacked. Expectations of results were not the most important reason for participation; what most of those interviewed were looking for from participation was experience of how FP projects worked and, above all, access to the network of those working in the area. This was particularly important in areas such as ICT and biotechnology where knowledge, skills and competencies were moving fast. Access to such a dynamic network was seen as a pre-requisite for success, but interestingly success

only came if partners 'played it fair' and shared new competencies acquired and new techniques developed. Partners that did not were locked out of future co-operation. One participant remarked, "If you don't put in your best competence, you end up losing your access to the network, and that goes beyond the project". This is a highly significant remark for it indicates that, for industrialists, the key issue in areas of new technology, where skills and competencies required at the leading edge move so fast, is not to be shut out from access when others, including competitors, have such access. 'Cheating' by trying to be a free-rider and not contributing your best is however punished by being thrown out of the network. As the French found early on, those who benefit most, are those who contribute most.

7.2.6 – The UK

The UK has been an active participant in all the Framework Programmes, topping the list in terms of numbers of participations for FP III. Its links have been especially strong with France and Germany and, increasingly, with Sweden. In terms of per capita receipts its performance was slightly above average, in terms of per R&D scientist, somewhat below average. Thanks to the British system of 'attribution' which requires expenditures under EU programmes to be attributed to a departmental budget head, British public accounts reveal estimates of the Framework Programme receipts from the EU. These amounted in the mid-1980s to approximately €150m rising to some €500m by the mid-1990s (Sharp, 1999, pp31-32). The latter represented some 10 per cent of total UK government expenditures on R&D and innovation.

The UK Impact Study (Georghiou et al, 1993) was interesting in that it showed that, except for the larger firms, access to funding was the most significant gain from participation, although as in other cases, access to complementary knowledge and skills via the programme was also rated highly. Amongst outcomes, access to further EU funded projects was again top of the list and very highly rated by academics and research groups, with enhanced skills and the development of new products and processes coming further down the list. These findings reflect the experience in the period 1987-1992 when publicly financed research funding in the UK was particularly scarce. But as the figures quoted above indicate, even in the mid-1990s, when pressures on public expenditures had eased a little, the EU contribution to expenditures was not insignificant in relation to the whole.

The UK government itself had somewhat mixed views about the Framework Programmes. The initial bias of the programme in the early 1980s towards 'applied basic' research ran counter to the dominant Thatcherite philosophy that sectoral support programmes were a sign of industrial weakness. The main thrust of policy at that stage was sceptical and aimed primarily at limiting expenditures. Officials, interviewed for the Impact Study, cited the fact that in negotiation the UK had secured a number of important national objectives, namely the stabilisation of the budget in real terms and the introduction of mandatory monitoring and evaluation. (Georghiou et al, 1993, p84). Partly because they suspected the French of wanting to turn the ESPRIT programme into a French-style 'grand programme', the British Government in fact gave stronger backing to the alternative EUREKA programme, which had no central funding, a slim-line secretariat and relied on national governments to support projects. Ironically, it was the EUREKA programme, not the Framework Programme, that ended up backing the big projects such as the High Definition TV initiative.

Over time the UK government came to accept (though never actually to welcome) the Framework Programmes. By the end of the 1980s it was deliberately withdrawing national funds from support for 'near market' R&D on the grounds that this was supported by the

European programmes. By the mid-1990s, while welcoming the monies being made available for the life sciences and new areas such as health, transport and the social sciences under the FPs, it shared the German fears that political factors (cohesion) was taking precedence over the traditional peer review and scientific excellence in selection procedures. Throughout this time, the policy of 'attribution', which required EU spending to be measured alongside UK government spending as a part of total public expenditure, effectively discouraged the sponsoring department, the DTI, from championing these programmes (because the more was spent under the FP head, the less there was for other departmental programmes). Equally, once negotiated and incorporated into budgets, the incentives were the other way around, to gain the maximum in project finance. The fact that by 1995, over 10 per cent of government support for R&D actually came from these programmes was testimony to their benefit to at least one set of users, namely academics and research institutes.

## 7.3 – General conclusions: lessons to be learned from experience with the Framework Programmes

There are a number of clear lessons for the CEECs to learn from these six countries' experience.

1. First and foremost, it is important to recognise that *the Framework Programmes are no pot of gold*. The total sum distributed annually, some €3bn, does not amount to much once divided up amongst 15 member states, let alone amongst the 26 envisaged once enlargement is complete. It will not (and is not intended to) provide substantial funding for public sector R&D programmes. This remains firmly the responsibility of the national government and in so far as help is needed in meeting either the capital costs of setting up new laboratories or the current cost of running these laboratories and training the necessary personnel to run them, governments must look to the Structural Funds, the EIB and the EBRD. The Framework Programmes are specifically about expanding horizons and offering research scientists and engineers in both public and private sectors the opportunities to link up with others working in similar areas. They are essentially about offering the 'avenues of opportunity' for such networking.
2. The second lesson to be learned is that *those who gain most are those who give most*. In a world where science and technology is moving fast, the great advantage of being part of a core network in a particular area is being able to know about and have ready access to new ideas and new developments. Being a central player and pulling your weight within such a network brings substantial pay-offs – you are in touch with the leading edge developments as they happen – whereas those who try to free-ride are likely to find themselves excluded from the club. This applies to both public and private sectors.
3. To be able *to become a central player does however require minimum standards of both public and private sectors*. To be able to 'plug-in' to the network requires having scientists and engineers capable of working in the leading edge laboratories. As Italy has learned, the system does not provide for second class players. It requires a system which trains scientists to post-doctoral level; which has internally a rigorous system of peer review to maintain standards; which acknowledges that programmes and projects need to be 'managed', and has procedures for monitoring both management and other aspects of performance. Any country wishing to play a significant part in the Framework Programmes has therefore to be prepared to put substantial investment in their R&D system and to bring it up to modern Western European standards.

4. *Ireland is in many respects an exemplar to be copied*. Here the investment goes back almost two decades, with a commitment from the mid-1980s to upgrade science and technological capabilities with emphasis not just on university science but on up-grading school-based education in science and technology and introducing a strong technological element in vocational education programmes. The Structural Funds provided the resources for such investments and Ireland was unique in devoting a substantial proportion of those funds to improving education and training and their infrastructures. But the Structural Funds also required that the Irish Government worked within an overall strategic 'vision'. This helped to ensure that expenditures on R&D by both public and private sector were geared to a clear set of priorities so that people knew what they were aiming to achieve. In this respect the Irish government deliberately used the Framework Programmes to work alongside national policies, recognising that they offered an opportunity for Irish researchers to experience working in front-line international laboratories, but that they, the Irish government, would need to make the complementary investments in, for example, developing graduate programmes.
5. Finally it is worth keeping in mind the Davignon question: "Where does the value added come from?" The gains in the Framework Programmes arise from initiatives which are better organised at the supra-national rather than the national (or regional) level – from sharing with others the costs of setting up a new synchrotron beam; from participating in joint initiatives to decode the human genome; or from work on establishing new standards to be adopted across Europe. It is worth remembering that there are many functions in an innovation system that are better organised at the national or even regional level – the promotion of innovation amongst SMEs, for example, is better looked after at a regional level as the German Länder have found. The countries that have gained most from the Framework Programmes are those that have successfully aligned national and regional policies so that they complement and reinforce each other.

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## Section 8 – Some More General Policy Conclusions

Each section of this report has concluded with a set of policy conclusions and there is no point in repeating them. The purpose of this brief concluding section is therefore to try to look across the previous sections of this paper and to draw some more general conclusions. It is worth reminding the reader that the focus of this study has been on the workings of EU policies in existing member states and the inter-relationships in policy making between national, regional and European levels. These conclusions reflect this brief: in effect they are a series of suggestions as to how to make the best of being a member of the European Union in the science, technology and industrial policy area.

In this spirit there are a number of clear messages that emerge from the series of studies reported in this paper.

*1 It helps to have a clear vision of where you want to go and how you propose to get there.*

In these days of market-led economies, governments shy away from setting even broad guidelines of strategy or vision, forgetting that it actually helps both private and public sector to know where they are expected to go and how they are expected to get there. For economies such as those of the Balkan countries, aspiring to accession, the Commission provides a useful 'route-map' of the hurdles to be overcome before even talks about accession can begin, and the accession process itself now has a clear map of the chapters of the *Acquis* which it is necessary to complete satisfactorily. Even within the Structural Funds, the release of Objective 1 Funding is supposedly contingent on embedding expenditure proposals with the framework of a clear regional strategy document and, as we saw in the case of Ireland, this can provide a useful tool for informally co-ordinating both private and public sector activity. Unless they disagree fundamentally with the objectives set out in such a strategy, businessmen actually find it helpful to know and understand the broad framework of government thinking – it helps them to plan their investments and make their commitments. Other players within the public sector can likewise do without the need for heavy-handed directives that inevitably breed resistance. In effect what is asked for is good teamwork. The captain announces the strategy and the other players automatically fall into line, knowing their place and role. We have repeatedly stressed in this paper the value of complementarity of roles between the different governmental and non-governmental players, so that, in effect, one layer of policy reinforces another. This cannot be achieved unless there is clarity of vision and broad agreement as to how the vision is to be realised.

*2 Ownership of the vision is also important*

We stressed in the previous paragraph the degree to which a clear statement of vision can effect informal co-ordination amongst players. Such co-ordination does, however, require the players to 'buy into' the vision – to share its broad aims and ambitions. This in turn suggests that in formulating their 'vision' (plans and strategies) governments need to consult widely and be, and be seen to be, as open and receptive to new ideas as possible. Where people, whether businessmen, civil servants or volunteers, feel they have played a part in formulating a strategy, they are naturally more inclined to work to promote it, adjusting their actions accordingly. Again it is a question of teamwork. A captain, who consults the team about strategy and takes account of views expressed, carries the team more easily into fulfilling that strategy in action. Successful policy initiatives require governments to persuade both important players or 'stakeholders' and the general public to share their vision.

*3 Government, business and academia –the three key players*

Given the importance of 'adding value' in the knowledge-based economy, government, business and academia become the three key players whose relationship is inter-dependent. The term 'the triple helix' is sometimes used to describe the inter-twining of the relationships between these three players – each unable to fulfil their function without reliance upon the other two. Wealth creation depends on the business sector providing initiative, enterprise and much of the financing of the (physical) capital. But increasingly it is human capital, not physical capital that is the scarce resource and here academia is the key player, ideally responsive to the needs of business as well as developing new ideas (blue skies research) exploring avenues for the future. Government meantime fulfils the role of facilitator, setting the rules of the game (competition and regulatory policies) and funding the educational and scientific infrastructure that creates the human capital. In this regard it is important that government, while interdependent, does not get too close to business. In a world where large multinationals can wield such power and influence, especially in smaller economies which have a tradition of corporate state control, they can use their influence distort the rules of the game for their own benefit. Competition policy, both at national and European level, provides an important bulwark defending consumer interests.

*4 The science base can become the nucleus for a successful economy*

Much stress has been put on the transient nature of advantages to be gained from attracting foreign direct investment on the basis of low wage costs and of the need to build up the capabilities of indigenous industry as a long term insurance policy for the future. The science base can provide such an alternative focus. A strong science base helps to attract investments bringing high value added jobs and it trains those participating in the skills and capabilities necessary to generate such investments. But the science base does not come for free. It requires substantial and long term investment in both physical and human capital and hard decisions on priorities. Few countries, especially small ones, can afford to invest across the whole range of science and technology. International collaboration, both within and beyond the EU, helps both to foster an international division of labour and to enable scientists in all countries to keep abreast of leading edge developments. It is worth remembering, however, that those who gain most from international collaboration are those who also give most. Governments, and business, cannot expect to be free riders. Unless they are prepared to commit the resources to make the long term investments necessary to build up skills and capabilities, little will come of the effort.

*5 Successful technology transfer requires person to person contact*

It is now widely accepted that much knowledge is never 'codified' as papers, software or blue-prints, but is passed down by word of mouth and apprenticeship (learning by working with and alongside others). The concept of 'absorptive capacity' emphasises that in order to develop new ideas and techniques, a country needs scientists and engineers who are sufficiently well versed with leading edge science and technology that they can understand and apply it in their own country. While the Internet is speeding up the exchange of ideas, the importance of learning through personal contact and working side-by-side on the laboratory bench should not be underestimated. Far too much thinking remains linear – that provided bridges (eg, science parks) are built to link science and technology the necessary transfers will occur. The contrast between the Italian and Irish experience explored in the regional chapter demonstrates how wrong such thinking can be. The key to successful technology transfer, as the Irish experience demonstrates, is to get people meeting and talking together through a series of interlocking networks. The state, or regional government, can play an important role in helping initiate such mechanisms. Ultimately, however, they will not

survive unless those participating discover mutual interests and take over and develop the networks as their own. In this regard, the Framework Programmes have provided an important avenue for international networking. In particular the Marie Curie programme has encouraged an active exchange of graduate students around European universities, with the strongest laboratories, as is appropriate, attracting and training the largest number of students. Learning from exchange applies also in the public sector: for example, when discussing the evolution of competition policy it was noted that the emergence of a network grouping amongst European authorities had enabled the nascent competition authorities in the CEECs to meet with and learn from their counterparts in EU member states.

*6 Subsidiarity is a good guiding principle*

Different levels of government have different roles to play in policy formation but the general maxim of devolving responsibilities down to the lowest level of government compatible with efficient service provision (the principle of subsidiarity) remains a good one. It not only limits the tendency for top-level administrations to grow large bureaucracies whose innate thinking is top-down but also it encourages the process of 'ownership' of policy which, as noted above, helps to promote effective policy formation and delivery. Where various levels of government are involved in policy development, it is important that they share objectives and pull in the same direction. In this respect, different, but mutually consistent policies, pursued by the different levels of government can reinforce each other to create a very strong and effective force. As noted above, such co-ordination can be imposed by one, usually the top, level of government, but often emerges naturally where the different levels of government share a mutual 'vision' of future developments.

*7 SMEs are key players but learn most from each other, not from glossy brochures*

The sections in this paper on globalisation and foreign direct investment have emphasised the important role to be played by SMEs both within the supply chains of the MNCs and as key players in the growth of indigenous capabilities. Those based on new technologies – the science-based new technology businesses – are in the van of new developments and quick to take up and exploit new ideas. They are however a minority of SMEs, usually only one or two per cent of the total population of SMEs. The majority are by their nature conservative, often micro-businesses which have grown around a single craft or tradesman. They are nevertheless central to the innovation effort. Here too, learning comes not from 'codified' messages – be they directives or glossy brochures from central government – but from others and for this reason, again, creating networks and support groups through such mechanisms as the local chamber of commerce, rotary club or, in rural areas, farmers' union, is often the most effective way of encouraging new thinking. At present we see Brussels, national governments and regional governments all competing in efforts to capture the SME sector. Such competition is futile. In most cases it is simpler, more efficient and more economic to use the regional tier of government to stimulate such activities, as has been shown in the many successful regional initiatives in countries such as Germany and Italy.

We come back to the question with which we started – what role for industrial policy? The series of studies presented in this paper have demonstrated that industrial policy is not just about subsidies for ailing industries, but rather about the whole complex of policies surrounding the issues of industrial development and innovation. No country can afford to ignore it as an area of policy, but equally needs now to do so in the knowledge that in most cases it is a matter of sharing responsibilities both with Brussels and with their own regional governments. The success of otherwise of the policies pursued depends on getting the right mix of elements within the equation. While ministers and their advisers are the agents of

change, they are dealing all the time with establishing or changing institutions, and institutions tend to develop a life of their own and respond differently in different circumstances. The studies presented in this paper suggest that governments do have a role and can promote successful change, but only if they understand the institutional framework within which they work and a sensitive to local political circumstances. As suggested in some of the broad general conclusions presented above, working with the grain of popular opinion and encouraging a sense of ownership of policy proposals goes a long way towards ensuring success.