INDUSTRIAL POLICY

1. Introduction

Fear of globalisation and of deindustrialisation tends to raise demands for industrial policy intervention. Industrial policy today operates within a globalisation process which involves greater competition worldwide, and which calls for significant restructuring of production. These considerations add to the traditional arguments for industrial policy intervention based on aid and protection for strategic industries in terms of national security or independence. What role should industrial policy have in the face of globalisation? Is the traditional sector-based policy dead? Must EU industry be defended? Some European countries, led by France, believe that the answer to the last question is "yes". This follows the tradition to foster and protect national champions. We have had some recent examples with the French government enforcing alternative "national" solutions by blocking the merger of Aventis and Novartis and of Suez and Enel. State aid has also come to the rescue of firms such as Alstom or Bull or sectors like shipbuilding in the past.

This chapter discusses a number of issues related to industrial policy in the EU. To begin, it is necessary to ask: "What is industrial policy?" The concept is so flexible that it can cover anything from corporate action to regional development plans and there is no consensus on a precise definition. According to a definition given by the US International Trade Commission, industrial policy involves "coordinated government action aimed at directing production resources to domestic producers in certain industries to help them become more competitive".[1] This gives a clear focus to sector-specific policies. However, the Lisbon Agenda of the EU states that "The main role of industrial policy at EU level is to proactively provide the right framework conditions for enterprise development and innovation in order to make the EU an attractive place for industrial investment and job creation, taking account of the fact that most businesses are small and medium-sized enterprises (SMEs)."[2] This makes no mention of sector-specific policies, though it does allow for policies to create conditions for innovation and development.

These differences in definition reflect underlying views as to the appropriate nature of industrial policy. We prefer the broad definition that industrial policy is the set of government actions affecting companies in different productive sectors in a country (including service companies) and, more specifically, affecting their ability to compete both domestically and abroad. This broad interpretation of industrial policy would therefore include microeconomic policies (antitrust, innovation and internationalisation), the provision of broad infrastructures (transport, communications, education, science and research) and sector-based aid to companies. In a narrow sense, industrial policy refers to the sector measures directly aimed at companies and industries.

Industrial policy forms part of government economic policy, and its goal should be to maximize the welfare of citizens. In developed economies open to the world market, this goal is closely linked to the competitiveness of companies and overall productivity of the economy. The *competitiveness* of an economy refers to the ability of its companies to compete in the international market. A company will have a competitive edge over rival companies if it can produce the same products at a lower cost or better products at the same cost, that is if it has the edge in terms of cost or demand (product quality and variety).[3] Obviously, other policies like monetary and exchange rate policy, fiscal policy, incomes policies or labour market reforms also affect the competitiveness of firms, but we do not include them under the definition of industrial policy.

Industrial policy has evolved over the course of the post-war era. The 1960s and 1970s were marked by the fostering of national champions, indicative planning, and state-owned firms with the objective of nar-

[1] See Ch. 2 in Tyson (1992).

[2] European Commission (2007).

[3] A distinction needs to be made between competitiveness and competition. Competition refers to the level of rivalry between companies operating in a market.

rowing the technological gap with US and Japan. This was also the period of trying to "pick winners" by selecting industries that were forecasted to be successful or that had such potential if appropriate help was given (those industries also typically had important externalities for the rest of the economy).[4]

In the 1980s scepticism grew about this approach and there was a move, led by the UK in Europe, towards privatisation, the introduction of competition and horizontal measures, common across industries (and mostly focusing on developing the science base and innovation). This tendency continued in the 1990s with an emphasis on technology in the Framework Programmes and the ESPRIT Programme. The recent Lisbon Agenda, aiming to make the EU the most technologically dynamic and innovation-driven region in the world, is formulated along similar lines.

However, the globalisation process and the emergence of international players like China and India have revived proposals for targeted industry aid and the "champions" approach. France has been at the forefront of this approach. In December 2004, Hervé Gaymard, the successor of Sarkozy as Finance Minister, stated: "We must have, and not only in France but also at the European level, an extremely ambitious industrial policy. We must nurture or create European champions in the industrial sector. We strongly believe that in the face of globalisation we cannot be naïve because … the law of the jungle is always to allow the strong to gobble up the weak, and there is no reason that Europe should drop its guard in this global competition" (Financial Times, 4 December 2004). In January 2005, Jean-Louis Beffa, CEO of Saint-Gobain, submitted a report to Jacques Chirac recommending setting up a new agency for development and innovation with the mission to tackle the perceived French weakness in high technology areas. The aim was to promote French or European industrial champions that would be technology winners in a horizon of 10–15 years; the intended tools were a few major programmes which, with co-financing from the private sector, would help overcome the imperfection of capital markets in financing long-term risky projects.[5]

By contrast, the European Commission has acknowledged the challenges to the manufacturing base of the EU but has maintained a commitment to horizontal industrial policy. The Commission has argued: "The main role of industrial policy is to provide the right framework conditions for enterprise development and innovation in order to make the EU an attractive place for industrial investment and job creation … From an industrial policy perspective, the role of public authorities is to act only where needed, i.e. when some types of market failures justify government intervention or in order to foster structural change … For these purposes the public authorities can make use of policy instruments such as better regulation, single market, innovation and research policy, employment and social policies etc. that apply generally across the economy without distinction between sectors or firms, together with other accompanying measures to facilitate social and economic cohesion … The Commission is committed to the horizontal nature of industrial policy and to avoid a return to selective interventionist policies."[6]

There is thus a clear divergence of views between those who favour sector-specific policies, and those who believe that industrial policy should be limited to broader horizontal policies. We address this issue in Section 3, considering arguments for and against sector-specific policies. We first set out arguments in favour of such policies, then consider their possible side effects, as well as the serious difficulties of successful implementation. We consider that there are very limited occasions when a sector-specific policy is likely to be useful; we propose that any such policies should be limited in time and should not aim to constrain competition.

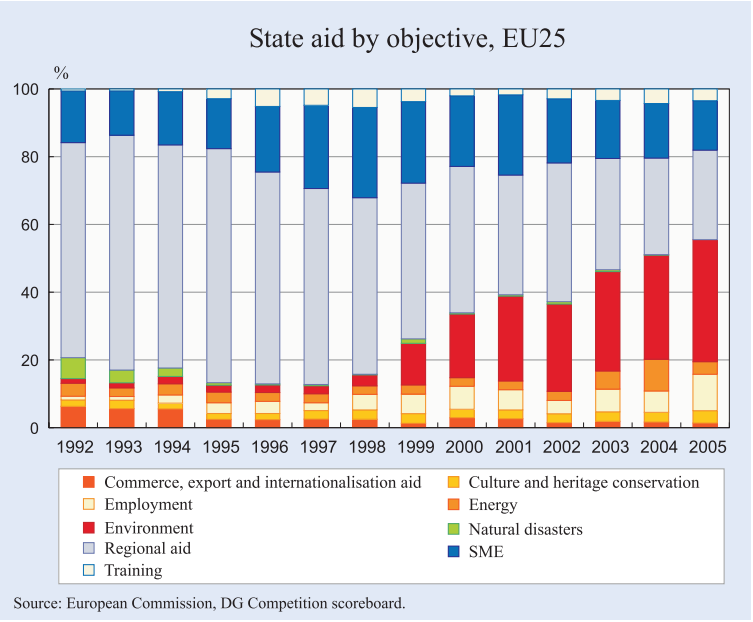
In Section 4 we go on to outline the need for horizontal policies, cutting across sectors in the economy, favoured by the European Commission. We take a broad definition of horizontal policies, and in successive subsections, we consider industrial policies, antitrust and regulation, and regional policies. Consideration of these policies raises an important issue, which we address in Section 5: at what level of government should decisions on industrial policy be made? Several issues arise here, including the costs and benefits of competition between regions or countries, the availability of information and the extent to which lobbying and capture is a problem at different levels of government. One important element of this discussion is the role of the Commission in overseeing industrial policies. We question whether it should have

[4] For example, see the UK Industrial Strategy of 1975 and Beath (2002).
[5] See also the statement by President Sarkozy after the Strasbourg European Summit of July 2, 2007.
[6] European Commission (2005).

a paternalistic role in intervening in a member state's policies that do not have externalities beyond the member state's borders. Section 6 sets out the conclusions.

Before addressing arguments for and against sector-specific policies, it is useful to briefly review the state aid spending in the EU. Of course, not all industrial policy is reflected in state aid spending, but it is useful to examine the overall scale of such spending, and its division between horizontal and vertical dimensions. We do this in Section 2.[7]

Figure 4.2



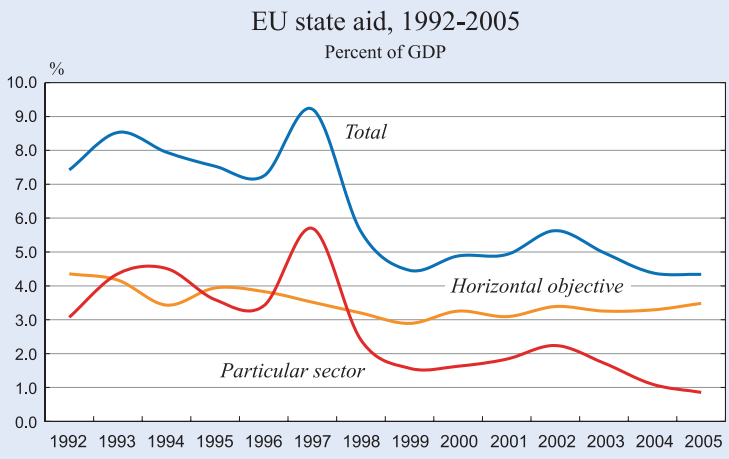
Source: European Commission, DG Competition scoreboard.

2. State aid in the EU

Figure 4.1 shows the evolution of EU state aid spending as a proportion of GDP between 1992 and 2005 as well as the amounts allocated to horizontal objectives and specific sectors. Overall, the proportion of GDP allocated to horizontal measures has been relatively stable, though falling gradually from 0.44 percent of GDP in 1992 to only 0.35 percent in 2005. By contrast, there has been much more variation in sector-specific aid. However, there was a marked fall at the end of the 1990s, with such aid falling from a high of 0.57 percent of GDP in 1997 (when it accounted for 62 percent of all state aid) to only 0.09 percent of GDP in 2005 (accounting for only 20 percent of the total). Overall state aid has fallen from 0.74 percent of GDP to 0.43 percent.

Figure 4.2 gives more detail about the composition of horizontal state aid. There are a number of different areas covered. There have also been significant changes in the composition of this form of state aid over this period of 14 years. In 1993, regional aid accounted for 61 percent of all horizontal state aid. By 2005, this had fallen to only 22 percent. By contrast, environmental aid – which effectively did not exist in the early 1990s – now accounts for 30 percent of all horizontal state aid. By contrast, the other categories in the table have been fairly stable. Aid to research and development has risen from 11 percent to 15 percent of the total (having reached 18 percent in 2001). Aid to SMEs climbed steeply in the 1990s from 13 percent of the total to 23 percent, but then fell away again to only 12 percent by 2005.

Figure 4.1

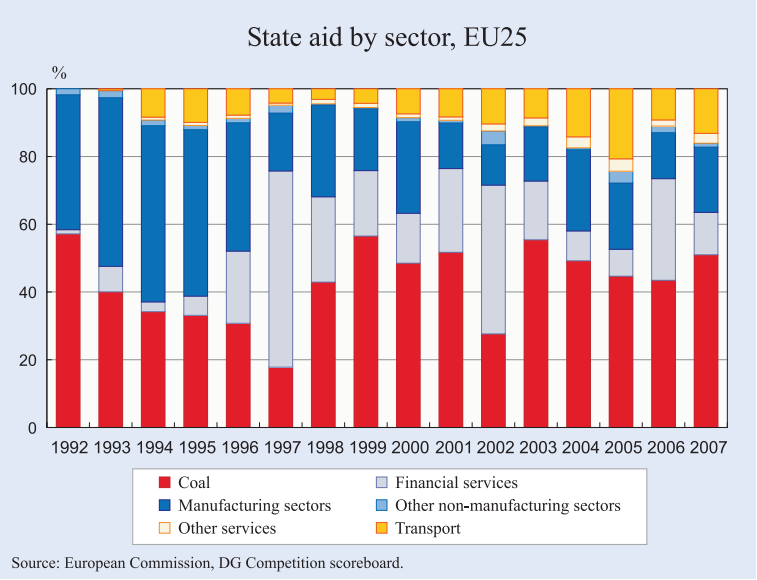


Source: European Commission, DG Competition scoreboard.

Figure 4.3 gives details about the composition of the sectoral aid over the same period. There is great variability in these proportions over time. For example, the financial sector received virtually no state aid in 1992; yet in 1997 it received as much as 57 percent of the total sectoral aid. This large increase explains the rise in total sector aid as a proportion of GDP in this year. Since then, its share has again declined substantially. By contrast, manufacturing

[7] This chapter is partially based on Vives (2006).

Figure 4.3



Source: European Commission, DG Competition scoreboard.

sectors received 40 percent of total sectoral aid in 1992; this fell to only 11 percent in 2002 before recovering to 20 percent in 2005. The transport sector has become more important as a recipient; it received no aid in 1992, but aid gradually increased to 20 percent in 2005. However, the largest recipient by some distance in both 1992 and 2005 – though not always in the intervening years – was coal.

More details of these aid patterns are presented in Table 4.1, which shows the aid in million euros at 1995 prices. In these terms, horizontal aid has been roughly constant over time, whereas sectoral aid has fallen by nearly half. The amount devoted to sectoral aid between 2001 and 2005 was, on average, 16 billion euros, half the amount corresponding to years 1992–1995 and half the amount devoted to horizontal objectives. In the early 1990s, sectoral aid concen-

Table 4.1

State aid by sector/objective in million euros at constant 1995 prices (EU25)

	Average 1992–1995	Average 1996–2000	Average 2001–2005
Agriculture	**16410**	**15671**	**15238**
Fisheries	**436**	**354**	**404**
Horizontal objectives, of which	**31000**	**29959**	**34732**
Commerce, export and internationalisation aid	1352	602	515
Culture and heritage conservation	532	629	849
Employment	516	1172	1972
Energy	868	658	1376
Environment	477	2006	8557
Innovation			120
Natural disasters	916	123	103
Regional aid	18148	13346	9444
Research and development	3880	4500	5691
Risk capital		1	84
SME	3977	5843	5188
Social support to individual consumers			2
Training	329	1074	923
Particular sectors, of which	**30298**	**25861**	**16202**
Coal	12134	8536	7199
Financial services	1359	8990	3956
Manufacturing Sectors	14655	6377	2560
Other Non Manufacturing sectors	504	357	306
Other services	151	247	360
Transport, of which	1492	1352	1819
Land transport and transport via pipelines	1	63	213
Maritime transport	0	561	1191
Inland water transport	15	27	12
Air transport	1483	688	258
Transport (unspecified)		27	143
Total aid less agriculture, fisheries and transport	**60250**	**54864**	**49571**
Total less railways	**78629**	**72330**	**67083**

Source: European Commission, DG COMP scoreboard.

Table 4.2

State aid by sector / objective as 100 * % of GDP

	EU-25	Austria	Belgium	Cyprus	Czech	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Ireland
Agriculture	**13.3**	30.6	9.2	16.2	14.3	7.0	33.0	132.0	16.2	22.4	4.8	64.1	35.7
Fisheries	**0.4**	0.0	0.2	0.0	0.3	0.7	0.0	0.5	0.2	0.0	1.0	0.0	0.4
Horizontal objectives, of which	**31.1**	**23.1**	**23.4**	**44.9**	**39.1**	**50.1**	**13.2**	**35.1**	**33.5**	**54.4**	**13.8**	**52.1**	**19.5**
Commerce, export aid	**0.5**	0.0	0.2	0.1	0.0	0.0	1.4	1.1	0.4	0.0	0.0	0.0	0.0
Culture, heritage cons	**0.7**	0.0	0.5	30.5	0.0	1.6	2.3	1.0	3.3	0.7	0.1	8.7	1.1
Employment	**1.4**	0.8	1.1	0.0	0.2	21.5	0.1	2.3	6.7	0.6	2.7	1.0	3.2
Energy	**0.9**	0.0	0.0	0.0	0.0	1.5	0.0	12.1	0.2	0.2	0.0	0.0	0.0
Environment	**6.9**	3.7	2.2	0.9	0.9	22.9	0.9	2.2	0.6	31.7	1.3	0.7	0.5
Regional aid	**9.4**	0.2	3.9	0.0	20.6	0.3	2.4	4.5	6.3	11.8	7.9	30.6	6.7
R&D	**5.4**	3.5	4.7	3.5	10.4	2.0	2.7	9.4	8.0	6.7	0.5	5.0	3.0
Risk capital	**0.0**	6.2	0.0	3.0	0.0	0.1	0.0	0.0	0.0	0.0	0.6	1.2	1.8
SME	**5.1**	7.2	9.2	1.0	7.0	0.1	3.1	2.6	7.9	2.0	0.7	4.3	2.6
Training	**0.7**	1.5	1.7	5.8	0.0	0.0	0.2	0.0	0.2	0.2	0.0	0.5	0.6
Particular sectors, of which	**18.5**	**1.9**	**7.2**	**82.3**	**0.0**	**5.7**	**0.0**	**4.8**	**6.5**	**13.5**	**0.4**	**67.0**	**6.9**
Coal	**8.0**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.2	0.0	4.3	0.0
Manufacturing Sectors	**2.5**	0.0	0.0	37.9	0.0	1.5	0.0	0.0	4.3	0.3	0.1	51.3	3.7
Other Non Manufacturing sectors	**0.4**	0.0	0.0	15.1	0.0	0.0	0.0	0.9	0.0	0.0	0.1	0.0	0.0
Other services	**0.3**	1.1	0.0	2.4	0.0	0.0	0.0	0.0	0.1	0.6	0.2	0.3	3.2
Transport	**1.7**	0.8	7.1	26.9	0.0	4.2	0.0	3.9	2.1	0.5	0.0	11.1	0.0
Total aid less agriculture, fisheries and transport	**41.7**	**24.3**	**23.5**	**100.3**	**39.3**	**51.6**	**13.2**	**36.0**	**37.9**	**67.5**	**14.2**	**107.9**	**26.5**
Total less railways	**58.9**	**55.7**	**40.0**	**143.5**	**53.8**	**63.5**	**46.3**	**172.4**	**56.4**	**90.5**	**20.0**	**183.2**	**62.6**

Source: European Commission, DG COMP.

trated primarily in manufacturing sectors and coal; in the late 1990s, financial services received the greatest amount, followed by coal and then manufacturing sectors. Towards the mid-2000s, sectoral help has concentrated in coal, manufacturing sectors and transport. There is also considerable variation across countries, as shown in Table 4.2.

3. Sector-based industrial policies

The examination of the need for sector-based industrial policies should start by considering an apparent paradox: recent studies on industrial economies, which highlight imperfections in the market and strategic behaviour of private and public sector economic agents, have provided numerous arguments in favour of intervention in theory; yet, in practice, the consensus among economists tends to be sceptical with regard to intervention and recommends prudence. Why is this so?

In a scenario of perfect competition and fully developed markets with no frictions, there is no room for government intervention for economic efficiency purposes. However, markets are far from perfect. Phenomena such as increasing returns to scale (because of fixed production costs, for instance) and market power normally associated with them, disparities in information available to agents ("asymmetric information" in the economist's jargon), such as between producer and consumer in terms of product quality, and externalities (interactions between agents, whether in consumption or production, not transmitted via the price system, such as technologi-

cal spillovers or pollution, for instance) entail market failures and open the way for government intervention to improve the allocation of resources. However, before we jump to the conclusion that industrial policy may correct market failures, we need to realise that any intervention carries side effects that can be pernicious.[8]

3.1 Arguments in favour of an active sector-based industrial policy

Let us examine some factors that may in principle justify intervention at the industry level: fixed costs and the implications for entry to the market, strategic competition in international markets, declining industries, external effects, and coordination issues, and imperfections in the capital market.

Fixed costs and market entry

When a company considers entering a market, private profit need not match social benefit given that the company disregards the external effects of its decision (on consumers, in terms of new products and/or lower prices, and on the profit of other companies). A prime example is excessive entry in a market because potential entrants have no regard for the negative external effects of their decision on the profits of established companies. However, the theoretical results are by no means robust and they depend on the type of company rivalry (for instance, in terms of price or quantity) and product features (level of product and quality differentiation). The result is that the direction of required intervention (encouraging or limiting entry) is difficult to determine as it depends on the industry's characteristics.[9]

Strategic competition in international markets

Protection or aid for industry, and for domestic companies operating in an international oligopolistic industry – that is, with few producers – relies on several arguments that essentially boil down to the suitability of utilising market power in favour of domestic industry so as to transfer foreign revenues to domestic companies. Strategic trade policy is based on trying to endow domestic companies with a competitive edge in the world market (through export subsidies or R&D aid, for instance), and/or trying to cut the native industry's production cost.[10]

Dynamic economies of scale can stem from the *experience curve.* In certain industries (such as aeronautics, shipbuilding and semiconductors), the production cost per unit falls with the total accumulated production volume by the company. In industries where the experience curve is crucial, there are reasons for the government to aid and protect the domestic industry from international competition to speed up the learning process. This is the infant industry argument.[11] It is also worth highlighting that how government ought to intervene depends on the industry's characteristics and that its benefits can be watered down by excessive entry.[12] Furthermore, if at the same time foreign countries subsidise their own firms, the home country may end up not being able to accumulate enough knowledge so as to be competitive (and learning by foreign rivals is slowed down).

The need for an active industrial policy in industries subject to international competition has been stressed on many occasions both in the US and Europe. For example, Laura Tyson (former Chair of the US Council of Economic Advisors) endorsed a defensive industrial policy, particularly in high-tech industries, designed to force open world markets to US products and offset subsidies available in other countries to certain industries (for example, in Europe for Airbus in the aeronautics industry). One of Tyson's key ideas was that in a world where free trade is systematically breached, a free-trade approach must be moderated by enabling a tit-for-tat response to commercial offences and unfair competition from rival countries. The dumping policy of the EU and even more the strategic industrial policy advocated by President Sarkozy also seem to be in line with this view.

An extreme example of strategic trade policy is support and subsidy for "national champions" practised in several European countries. However, it seems this policy, where governments help their big corporations compete in the international market, has traditionally failed to produce the expected results.[13] The empirical evidence on the effects of strategic trade

[8] In more technical terms: any intervention is subject to issues derived from the theory of the second best. In a scenario that is not efficient, if we move towards efficiency (say perfect competition) but do not quite achieve it (increasing competition, for instance), there is no assurance of any improvement to social well-being. To this, political-economy considerations should be added.
[9] See Sections 4.3.2 and 6.6 in Vives (1999).

[10] See Brander and Spencer (1983, 1985) and Krugman (1989). Related issues were also discussed in Ch. 6 of last year's EEAG report.
[11] See Melitz (2005) for a recent formulation of the conditions under which infant industries should be protected. See Leahy and Neary (1999a) for a qualification of the argument when governments cannot precommit to a policy course.
[12] See Eaton and Grossman (1986), and Horstman and Markusen (1986).
[13] Porter (1998).

policy is not very favourable in terms of overall economic welfare. In the best of cases, gains from this policy are negligible.

A related argument in favour of national champions is to secure supplies when there is market power upstream. This applies with force in the energy sector where size is important for bargaining in international markets (for example, in gas).

Declining industries

With declining industries we have the issue of rescue, restructuring and exit of inefficient companies, and in the extreme, the demise of the industry. Theoretical studies suggest that exit and restructuring can take different forms if there is no intervention in the market. The role of rationalisation policy can therefore be to propose the best way in terms of efficiency and fairness as a focal point. In general, if we allow affected companies to collude to form a "crisis cartel", rationalisation tends to be postponed and losses build up, ultimately ending up with a much worse outcome. In a scenario of inflexible wages and labour that is costly to reallocate between industries in the short term, aid for a declining industry can be efficient if it is temporary.[14] However, the subsidy may become permanent due to pressure from stakeholders and vested interests. Many subsidies in several countries and industries were granted provisionally and became indefinite. A permanent subsidy to an industry that has had a non-transitory shock is inefficient in the long run given that it delays or prevents the industry from adjusting. It is also worth noting that subsidies to declining industries highlight the potential conflict between efficiency and fairness goals. So, for instance, considering that a provisional subsidy tends to become permanent, a drop in price in the industry concerned (say a worsening of the crisis) would result in a cutback of the optimal subsidy for reasons of efficiency, but should trigger an increase in subsidy if the goal is to maintain income. The policy to restructure failing industries has eaten up a significant portion of resources allocated to industrial policy in Europe.

External effects and coordination issues

This argument for intervention is based on *external economies* and stresses vertical connections between industries (forward and backward links) and coordination problems. Very often this argument has a regional dimension. A classic example of investment coordination problems in a region is the development of means of transportation, such as a railway, and the setting up of firms in a region. Without a railway, companies do not set up in the region, yet if there are not enough companies, the railway has no source of business. Furthermore, in general the presence of rail links will not be sufficient to ensure growth in the region; a minimum (or critical) mass of companies is also needed.

One underlying issue is the small size of the domestic market to support the required fixed costs of investment. In this context there can be two stable scenarios: one (development) with investment and broadening of the market and the other (underdevelopment trap) with no investment and maintenance of a narrow market.[15] Thus investment in certain industries generating positive external effects can be justified and can achieve a superior equilibrium by addressing the issue of coordination of investment and avoiding the underdevelopment trap. However, this argument has been the subject of criticism when applied to developed countries and high-tech industries, given that the significant market is the international one rather than a local one. And in any event, if an industry with international spillovers is aided, such as a high-tech one, a country is actually helping competitors.[16]

Similarly, protection of nascent industries can be justified. If a domestic industry with positive external effects is not protected, it might never develop given that its average unit cost may always remain higher than the international price. On the other hand, provisional protection can allow it to grow and increase overall production, cutting average cost to a point below the international price. Then the industry can be opened to foreign competition.[17]

A final example of a coordination problem that public intervention can help to resolve is in setting standards. The relative success in the development of mobile telephony in Europe is attributed to an early adoption of the GSM standard.

[14] In fact, a negative shock in an industry would trigger, in the absence of government intervention, a fall in employment that is inefficient, because the ideal in the short term is to keep jobs (and lower wages). See Flam et al. (1983) and Neven and Vickers (1992).

[15] See, for instance, Rosenstein-Rodan (1943), Scitovsky (1954) and Murphy et al. (1989) for modern modelling of the "big push theory".
[16] See Grossman (1990).
[17] See Itoh et al. (1991).

Imperfections in the capital market

One source of market imperfection is based on information disparities between those wanting capital and those offering it. Companies needing capital may be better informed of the quality of their business project than investors. This makes it difficult for investors to assess the likelihood of success of the company needing the funds. The assessment of this likelihood is crucial given that companies have limited liability; if they fail they file for bankruptcy, and only have to meet their liabilities from shareholder funds. The asymmetry of information in the capital market will be particularly significant in new industries and fast-moving technology industries.

Given this asymmetric information problem, financial markets may push a firm into bankruptcy too soon or too late. This may depend on bankruptcy procedures. (For example, in the UK and Germany the procedures favour less reorganisation than in France or the US.)[18] Limited liability pushes in the direction of firms taking too much risk and the gamble for resurrection may keep firms out of bankruptcy too long. On the other hand, absolute priority rules (higher priory creditors being paid first and in full) may induce failure too soon, as the creditors face a coordination problem in the reorganisation procedure.

Similarly, the problem of selective interest rate subsidies for certain industries is that there are situations where the subsidy will encourage companies with a higher likelihood of success to seek loans, while there are other situations where the opposite will happen. One or the other situation will apply subject to features of the risks and asymmetry of information in the market. Accordingly, a lot of knowledge is required on industry characteristics to assess the suitability of a tax or a subsidy on the cost of capital.[19]

3.2 Side effects and problems in implementing sector-specific industrial policies

There are several broad problems with the implementation of sector-specific policies. The first issue is that, as has repeatedly been emphasised above, the type of intervention required very much depends on the industry's characteristics. Technology, demand conditions, level of product differentiation, risk level, asymmetries in information, type and level of competition, and many other factors all influence suitable industrial policy measures. This means that the *information requirements* of intervention to correct market failures are extremely high, especially so, given that in general the direction of intervention is ambiguous a priori. There are several elements of the information requirements. The government needs to correctly identify a market failure; it must also correctly identify the possibility of welfare gains from correcting the market failure in a particular way; given this, it also needs to design a policy that will induce appropriately different behaviour from economic agents that will correct the market failure. These are extremely demanding conditions. Highly detailed econometric and institutional studies, able to ascertain and measure structural characteristics and behaviour of companies, are needed in order to intervene successfully in a market. This applies to all types of intervention under examination.

A second issue in an international context involves the effects of *strategic behaviour* of countries. For instance, reprisals from countries affected by unilateral measures designed to promote or protect native industry can quickly degenerate into a widespread trade war where everyone loses. Ultimately, protection and aid can trigger reprisals in other countries, resulting in losses for all countries involved in the trade war. The outcome can be a stable situation that is inferior to free trade in terms of economic welfare.[20] Similar situations arise in international restructuring of industries in crisis where governments do their best to minimise domestic downsizing, as a whole worsening the problem of surplus capacity. Here an international multilateral restructuring agreement for the industry can be much more successful. There is evidence that in Europe, governments have attempted to transfer the cost of restructuring declining industries to other countries.[21]

Third, there are the *political economy* issues of intervention. In fact, any intervention or regulation leads to "capturing" opportunities for stakeholders and pressure groups. In this way, provisional subsidies or protection may become permanent and so intervention serves the private rather than public interest. Meanwhile, companies can incur expenditure to pressure the authorities or influence public opinion to secure benefits from government. This is particularly so in regulated markets and those subject to govern-

[18] See White (2005).
[19] See Grossman (1990), Stiglitz and Weiss (1981), DeMeza and Webb (1987), and White (2005, 2007).
[20] See, for instance, Dixit and Kyle (1985).
[21] See Neven and Vickers (1992).

ment intervention. In fact, it has been claimed that governments pick losers (or ailing sectors) instead of winners because policy is influenced by pressure groups that lobby to appropriate rents. In sectors that are growing, entry of new firms erodes such rents but in declining sectors sunk costs of entry typically limit entry. The end result is that firms in declining sectors lobby harder because they are protected from entry. In this sense, losers pick government policy (see Baldwin and Robert-Nicoud 2007).

Fourth, protection and aid measures for industry can impair competition and have a negative effect on *production efficiency.* Protected environments tend to generate inefficiencies. To quote John Hicks (1935): "The best monopoly profit is a quiet life." Inadequate or insufficient effort to cut costs has been called X-inefficiency. Pressure from a competitive market is crucial to limit such inefficiency.[22] In particular, the role of potential competition can be highly effective at cutting costs and reducing X-inefficiency of established companies. In fact, a company that has enjoyed market dominance in the form of high costs will have a competitive disadvantage when faced with potential new entrants (as experienced for example by certain US airlines during the industry's deregulation process).

An added reason explaining cost increases due to lack of competition is the rent-seeking effort to secure a monopolistic position. Therefore, companies with market power, endeavouring to achieve or maintain their monopoly, can invest strategically in production capacity, technology, product development or advertising, in a way that does not minimise production costs and is far from ideal in social terms. Among these activities, it is worth highlighting those designed to prevent entry of potential rivals, either by installing surplus capacity or excessive proliferation of product variety. Furthermore, managers and workers attempting to extract rents from firms may only do so if those firms make supra-competitive profits in product markets. In general, actions aimed at achieving a protected or monopolistic position can generate high costs through which rents are dissipated. A significant portion of costs incurred are useless in social terms (though part of them might merely be income transfers, for instance, from business owners to managers or workers).[23]

The empirical evidence suggests that it is precisely the exit of inefficient establishments and firms and the entry of efficient ones that drive productivity improvements. The sluggishness in the exit of inefficient firms in the EU is one of the main reasons why the EU lags behind in productivity growth in relation to the US.[24] Rescue and restructuring aid may prevent the exit of such low productivity establishments.

Finally, the cost of intervention includes the *efficiency cost* of raising the required funds. These costs include both administrative and compliance costs of collecting taxes, and also "deadweight" costs generated by taxes, which distort the behaviour of economic agents. This means that the marginal cost of public funds (that is, of raising one dollar for government spending through taxes) is likely to exceed one dollar. In the US estimates range from $1.17 to $1.57. In other words, every time the US government spends one dollar, the actual implicit cost to the economy can be as much as 50 percent higher.[25] Evidence from the EU varies considerably, and also depends on the country. Some evidence suggests that the implicit cost is even higher than in the US.[26] This may be because Europe has higher marginal tax rates than the US, which hence tend to create greater distortions and "deadweight" costs. The conclusion is that on conducting a cost/benefit analysis of any industrial policy, the cost needs to be adjusted upwards to reflect accurately the implicit cost of tax collection in terms of the distortions to the economic system.

One can illustrate the difficulties of sectoral intervention with the case of industries subject to R&D spillovers in an open economy. It has been claimed that the firms generating those spillovers towards other domestic firms should be subsidised. This is so when those spillovers occur in industries characterised by monopolistic competition where there is free entry (that is, there are no excess profits and each firm is negligible in relation to the market).[27] However, if the industries are oligopolistic the situation is more complex. Then a tax or a subsidy may be optimal depending on the character of spillovers and the competition mode in the industry. Optimal subsidies should then be carefully fine-tuned for each industry.[28] This is

[22] See also the discussion in Section 4 of Chapter 4 of this EEAG Report.
[23] There is accumulated evidence of the pernicious effect of market power on production efficiency. See Vives (2007) and references therein.
[24] See Foster et al. (2001) for the US; Disney et al. (2003) for the UK, and Bartelsmann et al. (2004) for an international comparison including Europe.
[25] See Ballard et al (1985), Jorgenson and Yun (1990, 1991), and Martin and Anderson (2005).
[26] Kleven and Kreiner (2006) generate very large estimates of the marginal cost of public funds for some countries when accounting for labour force participation responses.
[27] See Grossman and Helpman (1991).
[28] See Leahy and Neary (1999b).

obviously difficult, even without counting on possible retribution measures of trade partners.

In summary, although there are in principle a number of legitimate reasons for a sector-based industrial policy, the side effects of those policies are likely to undo the potential benefits and result in net welfare losses once all effects have been accounted for. Horizontal policies, in contrast, have a much better chance to generate net welfare gains in the social cost-benefit assessment.

4. Horizontal policies

Problems in implementing a sector-based industrial policy as well as available evidence from several countries explain the preference amongst economists and the European Commission for horizontal-type measures that are not targeted towards specific sectors in the economy. We now look at some reasons for horizontal intervention.

4.1 Horizontal industrial policies

First, *R&D* and *innovation activities* are classic cases of potential market failure that is highly significant due to its dynamic effects on productivity growth.[29] The production of knowledge and innovation both have the features of a public good and have significant external effects on the economy. The use of knowledge by an individual or company does not diminish use by others. In fact, producers of knowledge or innovations face difficulties when trying to appropriate their results because it is difficult to prevent others from using them. The patent system is designed precisely to ensure a return on investment in R&D activities. However, the prevention of innovation and knowledge leakages to the rest of the economy carries a cost, given that technology breakthroughs are disseminated less. There is a debate on whether the patent system is sufficient to foster the production of knowledge and innovation or if it, to the contrary, fosters duplication of effort and social inefficiency.[30] What is clear is that basic knowledge without direct commercial application has very substantial spillovers to the economy that cannot be appropriated by the scientists. There is evidence of substantial knowledge spillovers at the different levels in the R&D and production processes.[31] If, to this, we add potential imperfections in the capital market to fund R&D activities (due to asymmetric information it is extremely difficult to externally assess a company's research activity), the result is that subsidising basic research may be justified in social terms. The subsidy becomes more debatable when we move towards the application and development phases that can be put to commercial use. Subsidies should be channelled directly to R&D activity rather than be subsidies for production of marketable goods (except in the case of industries subject to the experience curve, discussed in Section 3.1). Aid for research, whether basic or applied (subsidy for a university, research centres, or tax breaks for innovative companies) are generally horizontal in nature, though they can be strategically used – industry-wide – as a strategic trade policy in the international market context.

We must also stress the danger of aid becoming a transfer that does nothing to change the overall R&D effort; rather it may merely increase profits of companies that already do R&D.[32] It is extremely difficult to evaluate whether already existing government aid for private R&D activity in OECD countries is ideal, excessive or insufficient.[33] However, traditional low levels of R&D effort in Europe as compared to the US and Japan perhaps suggest insufficient aid levels.

Second, training of *human capita* represents another case of potential market failure. This is induced by externalities. There may be insufficient private incentives to accumulate human capital. On the one hand, companies tend to invest little in multi-skill training, given that once trained, workers can leave and join another company. On the other hand, workers will invest in education only if there is a sufficiently developed industrial and services sector to allow them to leverage their investment. In the sphere of higher education and basic research, the problem worsens given that benefits (which may be very important in social terms) may be difficult to appropriate privately. Potential market failure in the accumulation of human capital happens in a context of imperfect financial markets given that otherwise workers could fund their own training. Note that some horizontal human capital training measures need not be neutral across sectors. For example, if they target software

[29] There is no theorem of dynamic efficiency analogous to the static one (that is a competitive market produces efficient results provided there are no externalities).
[30] See Boldrin and Levine (2002, 2006). According to them, markets for ideas are not different from other markets and governments should not foster innovation by providing monopoly franchises. Instead, they claim, proven mechanisms such as subsidies should be used.
[31] See, among others, Caballero and Jaffe (1993), Agrawal, Cockburn and McHale (2006), and Moretti (2004).
[32] This possibility is empirically highlighted in David et al. (2000).
[33] Grossman (1990).

engineers they would tend to favour IT-intensive sectors and firms.

Third, the establishment of a *brand image* could be associated with market failures. In markets where consumers are short of information on product quality, new producers will be at a disadvantage relative to established companies with a reputation for product quality. Poor-quality producers drag down other producers of their country who are trying to establish a reputation for quality. The way to offset this negative effect is not, however, through production subsidies; rather it is by establishing minimum quality levels and control over enforcement of warranty clauses.

These horizontal measures, and some sector-based ones, are even more significant for SMEs, which account for a substantial share of output and employment in several countries in the EU. SMEs can be severely affected by imperfections in financial markets as they have less capacity to self-finance and diversify to meet the fixed cost of directly accessing capital markets. Furthermore, they can be too small, particularly in terms of ability to establish *sales networks,* create brand image and incur fixed costs needed to *internationalise* the business. However, empirical studies show that they tend to be more *flexible and innovative,* contrary to the Schumpeterian theory that suggests that large companies innovate proportionally more than small ones due to available *economies of scale* in R&D activities and a large company's potential to diversify. In fact, empirical evidence on the relationship between firm size and R&D activity suggests that the innovation process does not provide economies of scale with regard to size of the company where R&D activities are carried out. In fact, large companies do not make a greater R&D effort, relative to size, than smaller companies: R&D expenditure grows, at most, in proportion to company size. There is also evidence that the number of patents granted per unit of R&D expenditure is higher for smaller companies. The specificity of SMEs suggests the need to design a horizontal policy adapted to their needs, to include encouragement of cooperation agreements to establish sales networks, brand image, R&D, and provision of specialist services.

4.2 Antitrust policies and regulation

Another fundamental component of a horizontal microeconomic policy is to ensure a framework for the smooth functioning of markets in order to keep them competitive. There are two aspects to this. The first is the need to preserve competition through antitrust policy. The second is to maintain regulations only where they are needed and to lessen the burden of compliance. We discuss each in turn.

Antitrust policy

An important point to realise is that keeping the markets competitive requires public intervention: this is the role of competition policy. This policy has a long tradition in the US, going back to the 19th century with the enactment of the Sherman Antitrust Act. The core antitrust principles in the EU are laid down in Articles 81 and 82 of the Treaty of Rome.

The need for antitrust policy has been questioned in a context of openness to international trade, such as, for instance, with European integration. The reasoning is based on the notion that the best antitrust policy is to open up to external trade. Industrial policy in Europe in the 1960s was based on the need for large corporations to compete effectively with the US, then unarguably the economic leader. The belief was that formation of large, European-wide corporations along with the removal of internal trade barriers, would foster economies of scale with no danger of significant increase in market power. Accordingly, the European Commission favoured mergers.

However, although it is true that opening up to the international market increases the degree of competition, two points need to be made. First, external competition as a disciplining mechanism only applies to internationally marketable goods. Industrial sectors have been increasingly exposed to a rise in overseas competition in step with globalisation. But this has not generally been the case for most services: either because they are not internationally marketable, or because of regulation, they have been mostly sheltered from competition. The lack of competition in the services industry in the EU has major repercussions on overall international competitiveness by increasing costs. The services industry is highly heterogeneous, yet in general its productivity growth rate is lower than that of manufacturing, perhaps because it is inherently more difficult to raise productivity in more labour-intensive industries. Thus, equal wage increases in manufacturing and services have a very different knock-on effect on prices.

There appears to be plenty of margin to increase competition in the services industry: in transportation,

telecoms, healthcare, the energy sector, professional services, retail trade, and also in the knowledge industry (universities and research centres).

Bringing in more competition is crucial inasmuch as opening up to international trade is only possible to a certain extent. The need for an active antitrust policy in recently deregulated industries to prevent unfair practices or dominance by ex-monopolies from undermining the purpose of deregulation should be underlined. The EU Competition Directorate has recently drawn up reports on several network industries (energy, financial services, telecoms) highlighting competition problems. Furthermore, competitive pressure is also crucial in order to induce firms to adopt innovations (this is particularly important in the service sector). The lower competitive pressure in Europe is blamed for the slower pace of IT technology adoption with deleterious effects on productivity growth relative to the US.[34]

Vigorous domestic competition can be a source of competitiveness internationally. Recent studies on international competitiveness of industries clearly suggest this. Examples of industries with a significant level of domestic rivalry and which have been internationally competitive for a long time are pharmaceuticals in Switzerland, automotive industry in Sweden, chemicals in Germany, and computers and *software* in the US.[35]

One potential conflict between competition policy and industrial policy is the control over concentration. On the one hand, concentration may increase economic efficiency by enabling economies of scale, yet on the other it may increase market power in the domestic market. Here we should distinguish between horizontal concentration, which tends to increase the market power of firms, and vertical and conglomerate ones, which typically involve efficiencies derived from the mergers of complementary activities. The conflict becomes acute when it comes to the promotion of national champions (as discussed in EEAG 2002 and 2007) and is diluted when large firms are formed in an integrated European market. Be it as it may, sometimes the protection of national champions may be accomplished indirectly (for example, setting minimum wages for postal workers in Germany raises barriers to entry in the sector).[36]

[34] See Jorgenson et al. (2006) for the US.
[35] See Porter (1986 and 1990). See also Itoh et al. (1991) for Japan.
[36] See also Box 1 in Chapter 2 of this report.

Regulation

Another aspect of the influence of government on competitiveness is through regulation. Excessive regulation is likely to generate a loss of competitiveness for domestic firms subject to that regulation. However, there are many reasons for the establishment of regulations, such as the protection of the labour force or the environment. Regulation should also be established in situations where competition is not workable such as with natural monopoly segments like transport or distribution in electricity or gas markets.

In general, though, regulation should be non-intrusive and, in particular, the "cost of doing business" in a country should be kept low. In this respect the scores attained by several countries in the EU are not very encouraging. The World Bank *Doing Business* report collects indicators on the ease of starting a business, dealing with licenses, employing workers, registering property, getting credit, protecting investors, paying taxes, trading across borders, enforcing contracts and closing a business in a universe of 175 countries.

Table 4.3
Ease of Doing Business Rank

	2007	2006	2005
Denmark	5	5	7
United Kingdom	6	6	5
Ireland	8	8	10
Iceland	10	11	11
Norway	11	10	8
Finland	13	14	13
Sweden	14	13	14
Switzerland	16	15	16
Estonia	17	18	17
Belgium	19	19	20
Germany	20	16	21
Netherlands	21	23	22
Latvia	22	20	31
Austria	25	22	30
Lithuania	26	24	15
France	31	32	47
Slovakia	32	31	34
Portugal	37	42	45
Spain	38	38	38
Hungary	45	51	60
Romania	48	55	71
Italy	53	50	69
Slovenia	55	53	56
Czech Republic	56	61	50
Poland	74	68	74
Greece	100	95	111
United States	3	3	3
Japan	12	12	12

Source: World Bank *Doing Business 2007*.

Table 4.3 provides the 2007 ranking for the EU countries and compares it with Japan and the US.

According to this ranking, the Nordic countries (Denmark, Norway, Iceland, Sweden, and Finland) are among the top 15 economies where doing business is easiest. The US, the UK, Ireland and Japan are among the top ten countries. Two Eastern European countries (Lithuania and Estonia) are ranked among the 20 most flexible economies for doing business. However, Romania, the Czech Republic, Slovenia, Hungary, and Poland are situated at the bottom of the European ranking and two southern European countries are placed at the bottom (Italy and Greece).

4.3 Regional policies

External effects in the local sphere induce a new dimension in industrial policy, linked to regional policy. Economic activity develops in a physical space, it is localised and needs *infrastructure*. Infrastructure, in broad terms including not just physical capital (for example in transport, communications and energy) but also human capital, is a classic source of *external effects* and is key to modern *growth* theories. In fact, the existence of infrastructure thresholds, notably the level of human capital below which a region is unable to take off and remains trapped in a stable, low-growth situation is a distinct possibility. In the presence of external factors, (competitive) markets need not allocate resources efficiently. We have already mentioned the issue of coordinating investment in economic development and incentives for research and innovation. The literature on economic geography suggests that a significant portion of external effects linked to market size are felt locally or regionally.[37] Consequently, support for industries with external effects need not be dissipated to other regions.

Two examples of external effects in the local sphere arise from geographic concentration of production and specialisation of the labour market.

First, industrial production tends to concentrate in certain regions. This is due to the interaction of economies of scale in production and transport costs. In the presence of increasing returns, companies seek to set up in a single location that is also near the "centre" of the market at a point with high density of demand in order to minimise transport costs. Demand in the centre (market size) will depend on the number of companies deciding to set up shop, generating a feedback mechanism that reinforces the consolidation of industrial cities and regions ("centre" as opposed to a non-industrialised "periphery"). The consequence of these phenomena is that location of industrial production is uncertain at the outset and can be significantly influenced by industrial policy measures to encourage location of companies in a certain geographical location. Relatively small interventions can have significant effects.

European integration reduces trade and transport costs in general and will therefore tend to favour geographical concentration, leveraging economies of scale and of agglomeration (recall for instance that in the US – a large and integrated market – industry is more geographically concentrated than in Europe). The reorganisation of production gives rise to major uncertainties: the periphery (the new entrants, say) still has lower wages, yet it may be far from the market centre. Depending on circumstances (and in particular reductions in trade and/or transport costs), proximity to market or cost advantage can take precedence. Without international trade, periphery countries (small and with lower wages) cannot achieve economies of scale and a high level of competition. Total openness (with no frictions, with low transport or trade costs) favours them, yet a partial reduction in trade costs (and/or transport costs) can result in concentration of activity in the centre.[38]

Second, a large local market facilitates development and training of *human capital.* We have already seen how there may be insufficient private incentives for training human capital. It should be stressed that workers themselves will only invest in education if there is a sufficiently diversified industrial and services sector to ensure the return on their investment. Furthermore, where companies endure idiosyncratic shocks, a larger market can provide insurance mechanisms both for companies, to avoid bottlenecks due to excess labour demand, and for workers, by providing diversified employment options.

The potential significance of external effects provides a potential field of action for an industrial policy intertwined with local and regional policy. This involves devising policies geared to the environment where positive external effects occur.[39] Their existence

[37] See Krugman (1991).

[38] Krugman and Venables (1990).

[39] Obviously, from a certain size of local or regional entity, external negative effects, such as congestion, appears.

is indicated by existing company groupings in a physical space (such as the software industry in Silicon Valley). In fact, a recent study (Greenstone and Moretti 2004) shows positive net results for regions in the US that have subsidised the installation of new productive plants. García-Milà and McGuire (2002) argue that agglomeration externalities may justify local subsidies for the establishment of headquarters. Davis and Henderson (2004) and Strauss-Kahn and Vives (2006) provide evidence in favour of this conclusion.

However, it should be noted that those studies do not analyse the potential neutralising effects of the subsidy game among regions. In fact, any government action will give rise to the problems mentioned above in discussing sector-based policies, due to the introduction of strategic inter-regional (or international) competition. This raises the more general question of the level of government at which industrial policy should be determined. We now turn to this issue.

5. At what level of government should industrial policies be determined?

Industrial policy could be determined at a sub-national, national or supra-national level. The choice between these is not straightforward and depends on a number of factors. Most important is the possibility – if policies are determined at anything lower than a supra-national level – of strategic interaction between competing governments. This mirrors the issues discussed in our 2007 EEAG report on tax competition between EU member states.[40] Whether industrial policy should be subject to competition between governments depends on the nature of the competition and the likely outcome of that competition. Other important factors in the choice of the appropriate level of decision-making, either for government or for the regulator, are information, degree of competence and capture possibilities. Regional governments and regulators may have better information than the central government, their degree of competence may be lower because of a lack of scale, and different forces impinge on capture possibilities. On the one hand, the central government may be more easily captured by lobbyists than regional governments because of the concentration of efforts of lobbyists where it is more effective. On the other hand, the proximity to the regional government/regulator is greater and may facilitate capture.

5.1 Regional competition

Governments may compete over a variety of policies in order to attract capital, firms, profit and other income flows to its jurisdiction. Probably the most debated policy concerns the taxing of corporate profit. Here it is most likely that governments compete for mobile capital and firms, driving down source-based taxes on capital; the reduction in tax revenue from these sources implies the need either to raise revenue from other (less mobile) sources or to reduce public spending. But governments may also compete over the provision of infrastructure, regulation of labour markets, financial markets, product standards and the environment. Several of these policy measures might form part of industrial policy, as defined earlier.

There are two possible models of *competition between regions* that are not mutually exclusive. Under the first, regions compete in terms of location, variety of resources and perhaps also in terms of "culture", both generally and in corporate terms. This would be a *horizontal* competition model where all regions would have a role to play.

Under the second model, regions are differentiated by the quality of the core services and infrastructure they have to offer. Therefore they compete *vertically*: given the same tax rates, all companies would favour regions offering higher quality. Clearly, without external aid, regions that seek to offer more services will generally have to levy higher taxes. The implications of this sort of competition are significant, because in the event that investment in "quality" is inherently fixed in nature, such as spending on infrastructure, there may be a "natural oligopoly" in the inter-regional market. In other words, given certain basic conditions, there is a maximum number of active regions in the sense that only a few can attract investment and/or demand for services. Entry of new high-quality regions can displace low-quality regions that until then had competed successfully in the international market. So, for instance, a country with low-quality tourism infrastructure can de displaced by the entry of regions with a better quality offering forcing other high-quality countries to compete fiercely via pricing. Furthermore, the entry of low-price competitors can ultimately erode the first country's

[40] See Chapter 5 of the 2007 EEAG Report.

options. The absence of an active infrastructure policy can therefore lead to the downfall of a region "sandwiched" between better quality and cheaper offerings.

If vertical differentiation components dominate, the number of successful "enclaves" might be limited in Europe and the success of some regions might be linked to the downfall of others. The optimal policy to follow for a large and a small region need not be the same. Take the case of innovation activities. Large metropolitan regions such as London and Paris may afford to pursue a laissez-faire policy. By investing in infrastructure (in terms of human and technological capital), large areas can build on critical mass, profiting from a dense market of versatile, skilled personnel, to allow global connections to bloom. In contrast, smaller regions may need to rely on a few key sectors and a battery of more active support policies in the area of innovation to overcome the critical mass problem.

Even so, a tendency towards diversification can also be observed in the smaller cities. This is the case in Stuttgart and Dublin, for example. The regional government in Stuttgart intervened to initiate a restructuring of production based on innovative sectors to confront the crisis at the beginning of the 1990s due, among other factors, to international competition from low-cost countries. The basic clusters in Baden-Württemberg revolve around the area of mechanical engineering and the automobile industry, with an expenditure on R&D only below that of Bavaria. Bavaria has banked on implementing an industrial policy of establishing centres of excellence in certain technological fields to promote synergies between research and enterprise. The most notable are the clusters of ICT (led by Siemens, Infineon and subsidiaries of Oracle and Microsoft), media and biotechnology (which have made it the second European centre after London). [41] In Dublin, an active policy has been followed in the electronics, pharmaceutical and financial sectors (though there is more production than R&D). Helsinki has led the transformation of Finland towards high technology with Nokia at the head. The ICT cluster was promoted by a rapid liberalisation of the telecommunications market, a tradition in advanced engineering and a culture of cooperation among companies in the cluster, and between companies and universities and research centres. Helsinki is also trying to diversify outside ICT into fields such as biomedicine and creative activities. In the case of Finland, the coordinated effort between the public and private sectors in R&D is perceived to be a key to success.

Strategic competition between regions of either horizontal or vertical form will, in principle, fail to produce efficient results in global terms given externalities that exist between regions. So, for instance, if regional investments in infrastructure are substitutes – generating negative external effects between them – there tends to be too much investment. If they complement each other, generating positive externalities, there will tend to be too little investment. This implies that theoretically regions could improve their situation by cooperating instead of competing. This relates to the idea of the "selection principle" (Sinn 1997, 2003). Industrial policies (and other policies) reflect governments' attempts to correct the failures of markets. Within a single country, the national government may be in a position to offset the existence of positive or negative externalities arising in the private market. However, if that country is open to flows of trade, capital and even labour, then externalities will not stop at the border. Just as competition between private firms cannot correct the externalities, neither should we expect competition between governments to correct the externalities. It is in precisely the areas in which governments may intervene to attempt to correct market failure that competition between governments cannot result in such a correction.

However, in asymmetric situations, and in the presence of information disparities, competition among regional governments could increase welfare. The reason is that competition induces firms to locate where they add more value since a government will offer more than another only if the external benefits are larger in the first region than in the second. Subsidy competition elicits information and is efficient as in an auction.[42] Competition among regions to attract firms will produce efficient outcomes when the deadweight loss of taxation is low and regions are asymmetric in the sense that external benefits of firms' location are unevenly distributed.

As well as problems concerning competition, two other factors should influence where industrial policies are determined. First, as noted above in the con-

[41] See Vives and Torrens (2005).

[42] See Besley and Seabright (1999) and Fumagalli (2003).

text of sector-specific policies, any successful industrial policy requires a considerable amount of information. It is possible that information about a specific region may be available to policy-makers in central government, but it seems plausible that information problems are more severe at the central level than a regional level. This therefore represents a factor which suggests that policy should be determined at a regional level.

Second, also as noted above, governments may be subject to capture by lobbyists. It seems plausible that this is more likely to happen at a centralised level. Lobbying is costly; lobbyists will therefore concentrate their resources on those policy-makers who have the most influence. For example, if a small number of policy-makers are influential in setting policy for the whole of the EU, then we can expect them to be the target of lobbyists who may be willing to invest large amounts in influencing their decisions. However, at the other extreme, if policy is determined at a regional level then (a) the gains from influencing the regional policy-maker may be smaller and (b) the cost of having an influence in all regions is much higher. These considerations indicate that the problems of lobbying will be more severe in a world of centralised decision-making: this may help explain the larger frequency of such lobbying activity in the US compared to the EU, which is much less centralised. Despite this, proximity to a regional or national government may work in the opposite direction and facilitate capture at lower levels.

To complicate matters further, the degree of competence of a government may be directly related to its size (for example, only large institutions can afford to hire the best civil servants).

Two interesting casual observations may be made here. First, there is a tendency towards the formation of larger regions to cooperate in certain matters in the EU, fostered by improvements in transport and communications, and the benefits to profit from economies of scale. Second, however, it is smaller states (that correspond more closely to economic regions) that tend to adopt more innovative measures in the face of globalisation (for example, Finland in education, R&D and IT, Denmark and the Netherlands in the welfare state, and Sweden for the reforms discussed in the 2007 EEAG Report).

Overall, we believe there are good reasons to consider allowing regions to determine industrial policy, possibly competing with each other. This is so because externalities are basically at the regional level and the regions have an information advantage in choosing policies. Competition should not be wasteful as long as the costs of public funds is not too high and asymmetries between regions important. Note that there is notable diversity of performance across the regions of the EU, and that this diversity does not tend to diminish (though there is convergence across nation-states).[43]

However, there is in any case a role for the EU to play in providing a framework of common rules to internalise externalities and limit rent-shifting incentives. For example, it could be argued that European funds (such as R&D support) should be allocated on a merit basis through competitive bidding procedures, which should be decided by committees of experts insulated as much as possible from political pressures. The model of the European Research Council to allocate funds to science, modelled after the US National Science Foundation, is a good example. The EU seems to be well placed to determine general horizontal industrial policy measures as a response to the challenges posed by globalisation. Another example would be to set a common energy policy that diversifies supply sources and the portfolio of technologies in a large integrated EU energy market.

Before turning to the process of reform of state aid control in the EU, let us mention that decision making at the national level (for large multi-regional countries) may suffer from lack of scale to confront the problems posed by globalisation and high capture possibilities. This would suggest deferring decisions on matters that involve only local externalities to the regions, while allowing the EU to deal with matters with important cross-regional externalities, which will naturally lead to cross-border spillovers.

5.2 State aid control in the EU

EU policy has moved towards requiring a well-defined objective, market failure or other objective of common interest, in order to allow the state aid. In the traditional approach economic analysis was downplayed. The definition of what constitutes state aid (according to Article 87(1) of the Treaty) was dealt with by the "market investor principle" – according to which investments by public authorities

[43] See Boldrin and Canova (2001), Ezcurra and Rapún (2006), Martin (2005) and Puga (2002).

in companies carrying out economic activities are considered free of aid if they are made on terms that a private investor operating under market conditions would have accepted – and "selectivity" of the measure in terms of granting the advantage. The "distortion of competition" and "trade affectation" criteria were dealt with in a summary, and sometimes inconsistent, way. The presumption of positive effects (such as spillovers) in different situations led to setting different thresholds for aid (for example, R&D industrial research expenditure could be funded up to 50 percent of eligible costs).

With the State Aid Action Plan[44] the guideline has become "less and better targeted state aid". That is, "state aid should only be used when it is an appropriate instrument for meeting a well-defined objective, when it creates the right incentives, is proportionate and when it distorts competition to the least possible extent." The statement implies the following "balancing test" to check whether state aid should be allowed: (1) State aid must address a market failure or another agreed common interest objective; (2) it must be targeted to the objective; and (3) possible competitive and trade distortions must be limited so that the balance is positive. The Research, Development and Innovation Framework (R&D&I) is an example of this approach (for example, it delineates four market failures relevant for R&D&I aid – externalities/knowledge spillovers; public goods/knowledge spillovers; asymmetric information and coordination failures – and asks whether the aid changes the behaviour of the firm).

This approach seems to be consistent with forbidding state aid which does not respond to a market failure or common interest objective, even though the aid may neither distort trade nor competition across borders. This implies a paternalistic approach from the Commission towards member states and seems at odds with the provisions of Article 87 of the Treaty and some case law from the European Court of First Instance (such as Philip Morris 1980, Le Levant 2006, Wam 2006).[45]

The big issue, obviously, is whether the Commission should be paternalistic in the way that it oversees the policies of the member states – even if they do not distort trade or competition in the EU. A potential benefit of a paternalistic approach is the commitment provided by the EU in helping to alleviate political economy problems and dynamic inconsistency in the decisions at the national level. Indeed, there is some evidence that the allocation of aid at the national level has been determined more by political than by economic factors.[46] The control of state aid by the EU has been seen as a way for national governments to resist the pressures of lobbies and political biases and to commit to sound policies.[47] The question is whether the EC can and should continue to play this role. The "blame Brussels game" may not last forever. And control at the EU level, which does not respond to cross-border externalities, may be eventually a victim of powerful national and big firm lobbies.[48]

The present evolution of state aid control seems to stand in contradiction to the lack of advance in political integration. In the foreseeable future it is not likely that states will relinquish more national sovereignty. If so, then it would be better to stick to state aid control purely based on limiting negative cross-country externalities and interventions to shift rents across boundaries. The present, more ambitious approach may not be sustainable and may backfire since it is not backed up by a sufficient degree of political integration.

6. Conclusions

The first challenge of industrial policy in the EU is to foster the competitiveness of its companies and the productivity of the economy. From the analysis set out in the chapter, certain principles and general considerations on industrial policy can be derived.

1. There are several arguments which in principle favour an active sector-based industrial policy: to provide suitable incentives for companies to enter and exit the market, to help to achieve a strategic edge in the international market, to assist in efficient (and fair) restructuring of declining industries, to leverage positive external effects, to address issues in coordinating investment, and to alleviate imperfections in the capital market.
2. However, any intervention gives rise to side effects that can make it undesirable. Thus, sector-based

[44] See Kroes (2005) and Friedeiszick and Röller (2007).
[45] See Spector (2007).
[46] Neven and Röller (2000).
[47] See Dewatripont and Seabright (2006), and Besley and Seabright (1999)).
[48] This discussion mirrors that of whether fiscal rules at the EU level can offset "political distortions" at the national level. These issues have been discussed in the 2003, 2006 and 2007 EEAG reports. See also Calmfors (2005).

intervention requires highly detailed information on the industry, can trigger strategic behaviour from rival countries with potential spiralling trade reprisals, can be captured by specific interests against the general interest, can restrict competition, damage production efficiency, and is costly to the public purse over and above nominal cost, due to the distortionary taxation needed to finance state aid.

3. Therefore sector-based intervention must be studied very carefully. International evidence and experience as well as theoretical studies suggest that any intervention, and in particular protection of productive sectors, (a) must be limited in time with credible and irrevocable commitments, and (b) must maintain a healthy level of competition between companies. In this way, the potential negative consequences of intervention are minimised. These observations particularly apply to declining industries where established interests tend to prolong protection well beyond what is required in terms of efficiency and fairness.
4. Horizontal policies, not targeted to any specific sectors, have gained increasing prominence. Promotion of R&D activities, training of human capital, promotion of internationalisation (brand image, sales networks, etc.), aid for SMEs are important factors in any policy that seek to promote competitiveness and productivity growth. European countries still allocate an important (though shrinking) portion of their spending to sector-based policies. Sector-based aid is mainly for failing or restructuring industries (steel, shipbuilding, coal).
5. Horizontal policies to lower the cost of doing business and encourage competition have an important impact on the competitiveness of companies and the productivity of the economy. A microeconomic framework that maintains an efficient functioning of markets is crucial, and in particular a light but appropriate regulation and an active antitrust policy. This factor is particularly important in many EU countries where restrictive practices and lack of competition have been the norm in many sectors.
6. Industrial policy is naturally interwoven with local and regional policy. With growing international competition, a regional policy to promote infrastructure (in a broad sense including human capital and the science and technology base) and to strengthen external effects of geographical groupings of companies should be allowed under the general competition and state aid rules of the EU.
7. Regional governments should be allowed to develop their own industrial policy, if necessary competing with other regions. The role of the EU should be to provide a common industrial policy in European-wide issues and a framework of common rules to internalise externalities and limit rent-shifting incentives. By contrast, national governments should engage much less in industrial policy. Instead, the regions, on the one hand, and the EU, on the other, are in the better position to design policy measures to confront globalisation.

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