

Industrial Policy: A Dying Breed or A Re-emerging Phoenix

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Abstract Real world industrial policy is often poorly designed and always heavily opposed. Good intentions are overshadowed by bad outcomes. However, no commonly accepted definition exists; concepts differ across nations, regions, stage of development and over time. After switching from the sectoral to the horizontal approach—and facing never ending problems with targeting, large projects and specific technologies—industrial policy seemed to phase out at the end of the last century. Recently, interest has re-emerged, due to globalisation, outsourcing, low growth and high unemployment (specifically in Europe). We present evidence on past strategies and the performances of various concepts. We describe the new “matrix approach to industrial policy” developed by the European Commission. Finally, we venture to define elements of a “Systemic Industrial Policy”. This new type of industrial policy differs decisively from policies of the past, and has been receiving an impetus from the EU “Lisbon Strategy”, as well as from the rise of China and the new EU member countries. It is the complementary policy to globalisation, increasing its benefits and empowering and retraining potential losers. Systemic Industrial Policy supports basic education, training and entrepreneurship in developing countries, promotes FDI and exports in catching-up economies and merges with innovation strategies, cluster policy and dynamic competitiveness in high income countries. It goes beyond combating market failures, as it builds on economic laws, comparative and competitive advantages and changing specialisation patterns. It acknowledges limited knowledge of policy makers, mutual learning and co-operation between firms, institutions and government.

Keywords industrial policy · competitiveness · innovation strategy · dynamic market failures

JEL Classification D78 · L16 · L52 · N60 · O25 · O38

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1 Outline and motives

Industrial policy covers a wide range of policy measures, some of which are explicitly put into practise under this heading. In many cases, however, an implicit industrial policy agenda is pursued under diverse policy lines, such as the provision of tangible and intangible infrastructure, public procurement and defence, merger control, antidumping and employment protection. And industrial policy is closely related to other policy areas like regional policy, education and training and last but not least, innovation policy.

There have been considerable differences not only in the philosophy, but also in the actual pursuit of industrial policy over time and across countries. The differences may have been larger between the US, Japan and Europe, but were also present within Europe.¹ Ketels (2007) claims, that the US has a de facto industrial policy focusing on science and technology, small firms and clusters, enabling strong regional specialisation. Finland developed a systemic, proactive policy design, making knowledge the driving force of transformation based on a cluster approach and the search for technologies defining the competitive edge in the future (Ylä-Anttila and Palmberg 2007). In the United Kingdom, the attraction of FDI has always dominated industrial policy (Bailey and Driffield 2007). All country specific approaches have to be adapted in the integrating and globalising world; France can no longer rely on the sector approach and on favouring specific technologies. Firms are international players, and preconditions for “high tech Colbertism” are no longer given (Cohen 2007). Japanese policy abandoned the focus on sectors and specific technologies; it now promotes competition, and links between universities and firms (Nezu 2007). China is beginning to engage in an innovation policy complementing more traditional industrial policies (Hutschenreiter and Zhang 2007). The new member countries of the EU are focusing on foreign investment, while industrial policy strategy is becoming broader as a consequence of the Lisbon Strategy (Török 2007).

Soete (2007) analyses the gradual transformation of industrial policy in the direction of innovation policy, with a definition of innovation including social, organisational and environmental innovations. The European Commission recently developed a new concept of industrial policy which complements the dominant horizontal approach—broad measures, which have an impact on most or all industries—with measures specifically important to specific industries. This new approach (Zourek 2007) was labelled the “matrix approach” in Aiginger and Sieber (2005). The columns of the matrix are comprised of individual policy lines, while sectors define the rows. The boxes of the matrix provide information on the expected industry specific impact (be it the importance or the specific nature of the intervention).

This paper is structured as followed: Section 2 analyses the content and the scope of industrial policy and relates policy to the changing role of manufacturing in high-income countries. Despite the increasing share of services, manufacturing remains a core sector, even if the distinction between manufacturing and service is increasingly unhelpful. Section 3 provides the rationale for industrial policy, the transition from policy-oriented arguments and static market failure to dynamic positive externalities, failures in co-ordination and informational problems. It also summarises arguments against policy intervention. Section 4 supplies data on real world industrial policy, the strategies pursued and the results

¹ For references on country specific industrial policy see Aiginger (1995, 1996), Brösse (1996), Cohen (1992), Cohen and Lorenzi (2000), Gurbaxani (2000), Holmes and Seabright (2000), Ketels (2005, 2006), Krugman and Hatsopoulos (1987), Lindbeck (1981), Ministry of Economy, Trade and Industry (2004), Monopolkommission (2004), Palmberg and Martikainen (2005), Starbatty (2004) and Yoshida (2004).

achieved. It describes the matrix type approach to industrial policy and the sector taxonomy recently proposed by the European Commission, as well as its first application. Finally, Section 5 provides a vision of what a systemic industrial policy might look like in the future. This vision, which is related to the Lisbon Agenda, is closely linked to innovation strategy and combines industrial policy proper with education, regional strategy, and labour and product market flexibility. Systemic Industrial Policy (SIP) fosters the dynamic competitiveness (Aiginger 2007a, b) of a country or region where competitiveness is defined by a welfare function with a set of goals in which social innovation and environmental progress also play important roles. We argue that a systemic industrial policy can support the EU Lisbon Strategy, while at the same time serving as a new complementary policy strategy in the globalising world economy.

2 Industrial policy and the role of manufacturing

2.1 The scope of industrial policy

Numerous definitions of industrial policy have been suggested. A very small sample of available definitions is given in Appendix. Definitions disagree upon the following issues:

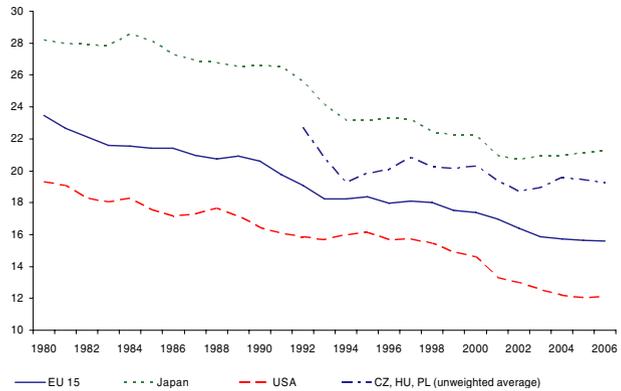
- sectoral targeting versus horizontal measures which have a broad impact on many or all industries (sectoral versus horizontal);
- policies which restructure predominantly large firms, often decelerating the speed of change, versus the promotion of entry, entrepreneurs, spinoffs, new capabilities (passive versus active);
- boosting competitiveness via “framework” conditions versus micro intervention for specific firms, regions, and industries (general measures versus “picking the winners”);
- subsidies to prevent exits (out of political reasons) versus the promotion of innovation, training and other “dynamic activities” (restructuring versus promoting positive spillovers).

Analysts sceptical about industrial policy usually chose the more controversial targeting approach as the favoured definition. They criticise policies discriminating between narrowly defined sectors or industries, the attempt to define “strategic industries”, micro intervention and subsidies for large firms. Since a broad majority of authors reject tailor-made, industry-specific interventions, subsidies or trade barriers, a definition stressing the sectoral approach leads a majority of economists to renounce industrial policy. “The best industrial policy is no industrial policy”, is claimed usually by authors first choosing a concept emphasizing a sectoral policy.

On the other side of the spectrum, researchers who, a priori, are favourably inclined towards industrial policy tend to describe it as a set of measures to promote innovation, education, and spillovers, or to improve business conditions in general. Industrial policy is defined in terms of improving the general framework or business conditions, making firms able to innovate and to adapt to new challenges. Since a majority of authors favour broad measures, which foster competitiveness via growth, cluster policies and centres of excellence, the choice of a horizontal definition leads to more widely based support of industrial policy.

A small number of influential researchers stress the very strategic character of industrial policy. The set of supporters expands when strategic issues at the regional level are also taken into consideration. Regional subsidies and specifically the use of European Structural

Fig. 1 De-industrialisation in different regions. Note: nominal value added relative to nominal GDP; 2003/2004 estimated using real data; Source: WIFO calculations using AMECO



Funds and Cohesion Funds for peripheral or lagging regions, are in fact conditional to the existence of “strategic development plans”. Without doubt, these do contain some elements of strategic industrial policy (defining promising areas and activities, the strengths and weaknesses of regions, and even flagship projects).²

A middle of the road definition would be: industrial policy is a “set of activities which create a favourable environment for business and for adapting production to changing domestic or international demand”.

2.2 The size of manufacturing

Industrial policy does not and should not focus on manufacturing alone.³ Production related services are important for competitiveness. And statistical boundaries of manufacturing are more blurred than ever. Nevertheless it makes sense to start with figures and trends. The—narrowly defined—share of manufacturing in GDP is 16% in the EU 15, this is much lower than in Japan (21.2%), and is higher than the share of 12% in the USA. The very large differences between these three regions reflect not only the per capita income hierarchy (with the US enjoying the highest GDP per capita), but also specialisation and trade balances. Japan has a high surplus in merchandise trade, while the US has a very high deficit. The EU has rather small trade surpluses for goods as well as services. Among the EU 15, Ireland has the highest share of manufacturing in GDP, and precedes Finland and Germany; a group of countries exhibiting a relatively strong base in manufacturing follows and includes Sweden, Austria and Italy. The share of manufacturing in the new member countries varies; on average it is higher than in the old member countries. Slovenia’s share of manufacturing is as high as that of Japan. Slovakia and the Czech Republic also achieve high shares, while in Poland, the share of manufacturing is low (Fig. 1; Tables 1 and 2).

The share of manufacturing decreases with rising per capita income. The speed of decline in Europe has been relatively steady, at about three percentage points per decade.

² Broad overviews on industrial policy are available in Aiginger and Sieber (2006), Aiginger et al. (1998, 2001), Bailey and Cowling (2005), Gordon (2002), Jacquemin (1975), Maincent and Navarro (2006), Navarro (2003), Neven and Seabright (1995), Rodrik et al. (2004) and Tichy (2004).

³ The sector “manufacturing” is increasingly being interpreted in a wider sense, including business services, and sometimes intangible and tangible infrastructure relevant to producers. Specifically in the US industrial policy had never been confined to the sector of manufacturing.

Table 1 The share of manufacturing in the total economy

	1980	1990	2000	2006	Absolute difference 1980/2006
EU 15	23.5	20.6	17.4	15.6	-7.9
Japan	28.2	26.6	22.2	21.2	-7.0
USA	19.3	16.5	14.6	12.1	-7.2
Germany	27.1	25.6	20.7	21.1	-6.0

Nominal value added relative to nominal GDP; Source: WIFO calculations using AMECO

The trend has been similar in Japan, although there was less decline in the eighties and there has been faster growth since then. The US data indicate that the decline will continue: despite starting with a relatively small share, the decline continued between 1980 and 2006, with the share shrinking from 19.3 to 12.1%. Among the European countries, only Ireland managed to increase its share of manufacturing, from a moderate level in 1980 to the top position, mainly via direct inward investment. In Finland and Sweden, which have relatively large and growing telecom sectors, the share of manufacturing is relatively stable, as is also the case in Austria. The manufacturing sector has been shrinking in southern countries, probably accelerated by rising competition in labour intensive sectors from new member countries. In Hungary, in the Czech Republic and in Slovakia manufacturing has been stable since 1990. Poland was not able to attract enough foreign inward direct investment to stabilise the downward trend.

Table 2 The share of manufacturing in different countries 1990/2006

	1990	2006	Absolute difference 2006–1990
Belgium	20.3	15.1	-5.2
Denmark	15.0	11.0	-4.0
Germany	25.7	21.1	-4.5
Greece	14.5	9.9	-4.6
Spain	19.1	13.1	-6.0
France	16.2	11.7	-4.4
Ireland	25.3	21.3	-4.0
Italy	21.2	16.5	-4.8
The Netherlands	17.1	12.4	-4.6
Austria	19.1	17.6	-1.5
Portugal	17.9	13.5	-4.4
Finland	19.6	20.2	0.6
Sweden	18.7	18.2	-0.5
United Kingdom	20.9	12.3	-8.6
EU15	20.6	15.6	-5.0
Czech Republic	22.2	23.2	1.0
Hungary	19.0	18.4	-0.6
Poland	24.4	16.2	-8.2
Slovenia	28.8	21.2	-7.6
Slovakia	18.3	18.6	0.3
Japan	26.6	21.2	-5.4
USA	16.5	12.1	-4.4

Hungary 1991 and Poland 1992; Source: WIFO calculations using AMECO

2.3 Statistical decline and maintained importance

It is well-known that the share of manufacturing in per capita GDP renders a humped-shaped pattern. It rises during industrialisation and then decreases once countries attain very high income levels. The share of industry in GDP is therefore greatest in medium income countries (see Clark 1957, Fourastier 1954). The basic force behind the decline of manufacturing in rich countries is that services have a higher income elasticity (consumption increases more than proportionately relative to income) and technical progress is faster in manufacturing than in services (leading to lower price increases for industrial products and thus a smaller share in GDP). Consequently, the decline in manufacturing is stronger for nominal data than for real data and stronger when measured in terms of employment than when measured in terms of production.⁴

The importance of manufacturing is likely to be understated by quantitative shares. Manufacturing currently dominates the trade balance, it is the engine of growth for many upstream industries, it furthers the development of technologies and creates spillovers to services. The share of hybrid products, whereby consumer value or productive use is created when goods are combined with services, is increasing. Manufacturing and services often cannot be separated; if production is relocated, research and other high value-added services follow. The resurgence of growth in the US, Sweden and Finland in the nineties—as well as Ireland’s catching up story—was led by manufacturing, while slow growing countries achieved only moderate levels of manufacturing growth. A good example of how important the production sector is with respect to spillovers to other industries and services is the information and communication technology sector. ICT started in countries with strong firms producing new products and developing new technologies. Then, productivity growth accelerated in the ICT sector, ultimately boosting overall productivity and creating new products in industries and services utilising ICT.

The phenomenon that industry and services are becoming more and more interwoven may encourage an industry definition embracing not only the production process of goods, but also related services (financial, ICT, logistics and business services, for example).⁵ If we combine manufacturing and business services the decline in manufacturing (3.7 percentage points between 1991 and 2003) is more than compensated by the increase in business services (4.5%). The combined share of “extended industry” increased from 67.0% in 1991 to 67.8% in 2003.

Summing up we conclude that the distinction between manufacturing and services becomes increasingly unhelpful and statistically blurred. Value creation depends on service elements and industrial policy should focus on all industries inclusive business services.

3 The economic rationale for industrial policy

3.1 Changing rationales in a knowledge-based economy

The rationales for policy intervention in the globalising economy are different from those which prevailed in closed economies. Openness has surged, as can be seen in rising export

⁴ However, nominal shares seem appropriate, since they measure factor incomes generated.

⁵ This is done for example in the Netherlands. The Ministry of Economic Affairs cited in its “Industry Memorandum” a study by Schenk-Theeuwes (2002) which states that “the ‘ripple effect’ emanating from the manufacturing industry onto financial and business services in the Netherlands was three times as high in the late 1990s as in the 1970s.”

and import shares. Intervention—in such forms as tariffs and subsidies—is limited by the rules of the Single Market, bilateral trade agreements and finally the WTO and the IMF (“structural conditionality”). Industrial policy is working to increase welfare and is supported by international law when it counteracts market failures. Static market failures, such as monopoly power, insufficient market size, and the imperfection of markets are of less consequence in an open, integrating economy. On the other hand, dynamic market failures originating from knowledge spillovers and innovation are becoming increasingly important in high-income countries; informational externalities and co-ordination failures are also gaining significance (Rodrik 2004).⁶

Dynamic market failures are specifically abundant in technology and knowledge intensive industries, which today contribute the lion’s share of growth in manufacturing. The dynamic rationale for intervention is founded in first mover advantages, experience curves and capabilities. First mover advantages and learning curves may call for the enactment of policies to foster rent shifting, the creation and support of national champions, technological lead projects, headquarter policy and the specific support of promising industries. Lock-in problems, network externalities and industry standards are important to competition and competitiveness. Calling for co-operation and supporting related institutions is characteristically derived from the perspective of a “system of innovation”. New growth theory, as well as evolutionary theory, deals intensively with the importance of incentives, the costs of innovation and the contribution to growth by new general purpose technologies, such as ICT and biotechnology.

The realm of industrial policy has always extended beyond market failure into policy-based arguments. Counteracting the strategies of other countries and softening the burden of structural change are often used as arguments to justify a country’s own intervention. The cost may be cumulative, leading to a degree of uncertainty, which biases investment and consumer demand downward. This is specifically the case when regions are highly specialised in declining industries.

Policy-oriented arguments will never die. But it is now acknowledged that counter-vailing subsidies are costly, trade policy should eliminate the first subsidy instead of giving excuse for retaliatory measures. And decelerating structural change is increasingly costly in a globalising world.

A second line of arguments calling for an industrial policy that goes beyond market failure had been interventions in favour of “strategic industries”. Strategic industries could be industries of “essential supply”, in which it is important not to rely on imports, but to have own producers. Essential supplies could be raw materials, energy or water on one end of the industry spectrum, and high tech or defence-related products and flagship technology programmes on the other end. In principle, this rationale for national policies should lose importance in a globalising world, but the situation is somewhat different in developing countries or in countries lagging in technology but possessing a very strong position in one important resource, as is the case with Russia in energy. Reverberations of the arguments are heard today with respect to water resources.

While policy oriented arguments and the selection of resource-based strategic industries are losing popularity there is a revival of forward-looking broad strategies for countries and regions. Defining “economic strategies” now makes use of the fact that economic analysis allows us to predict to some extent the pattern of country specialisation. With

⁶ The “failure of co-ordination” argument for industrial policy is that many projects require the viability of simultaneous investment, but the investment decisions are made by independent agents.

rising income, the shares of labour intensive industries decline, while those of skill and capital intensive industries increase. Demand for food and housing has low income elasticity; technical products and services have high income elasticity. Comparative advantages shift from low wages and taxes to skills, knowledge, innovation, informal learning etc. An industrial policy which is future-oriented encourages the development of skills needed tomorrow. The “Lisbon Strategy” is such a forward-looking strategy, not only defining goals, but also instruments and targets for specific inputs (R&D expenditure targets, share of participants in life-long learning programs etc.).

The rationale for a future-oriented policy, and for close co-operation between firms and policymakers, attains an interesting dimension if we follow Rodrik’s argument that the main argument for industrial policy is not the claim of superior knowledge on the side of the government, but the limited knowledge about the size and nature of externalities on the side of both firms and the government.⁷ Industrial policy can then be interpreted as the process of learning from each other. The task of industrial policy is about “eliciting information from the private sector on significant externalities and their remedies”. A problem with this approach is that it continues to be important that the government co-operates but at the same time to keep private firms at an arm’s length, so as to minimise rent seeking and corruption. Co-operation is necessary for eliciting information, but upholding independence and unbiased judgement are also crucial for success. This delicate balance has been called embedded autonomy (Evans 1995).

3.2 Arguments against policy intervention and caveats

Defining the optimal degree of intervention needs to take into consideration the possibility that good intentions are often overshadowed by bad outcomes. Policies promoting structural change are often implemented in such a way that they slow down actual change. Temporary measures to counteract a specific market failure can be applied permanently even when they do not succeed in eliminating the original problem. Future-oriented interventions can be based on forecasts which prove wrong or overlook a specific condition necessary for success. Picking the winners does not work and industrial interventions are prone to political bias and even corruption (Rodrik 2004, p. 36). Flagship projects are often badly managed. Strategic interventions can be counteracted by the parallel strategies of other countries. Furthermore, a market failure does not always call for intervention. The direct costs of intervention may be too high; an implementation bias could add to the costs and result in a public failure larger than the market failure. Vested interests may be more important than market failures. Additionally, an intervention should implement that instrument, which minimises costs and the length of intervention.⁸ Fostering market access, competition and the birth of new firms could be superior substitutes for subsidisation and the regulation of output and prices. Quality control, certificates, guarantees and well-defined property rights reduce market failure more than command and control or subsidies.

⁷ “Industrial policy is a discovery process..... where firms and government learn about costs and opportunities and engage in strategic coordination; government has imperfect information, so does the private sector.” (Rodrik 2004)

⁸ For a sceptical summary of the rationales for industry policy see Pack and Saggi (2006, p. 267): “Overall there appears to be little empirical support for an activist government policy even though market failures exist, that can in principle justify the use of industrial policy.”

4 Industrial policy in Europe: experience, renewed interest, new concepts

4.1 European industrial policy: differences in approaches and success

Real world industrial policy never follows theoretical concepts. Aiginger and Sieber (2005) try to find indicators as to whether individual European countries followed (1) the old approach based on subsidies (state aid), (2) the single market strategy of deregulation and opening markets or (3) the future-oriented approach of fostering innovation. It then relates the “input” of industrial policy (subsidies, regulatory change, and innovation) to “outcomes”, such as high shares of sophisticated industries, rankings according to the Lisbon Strategy, and macro performance.⁹

The results suggest distinguishing between four country groups:

Small northern European countries, namely Sweden, Finland and Denmark implement a future-oriented industrial policy, they invest heavily in research, education, information technology and life long learning: these countries spend little money on state aid; their regulation of product and labour markets can be characterised as low to medium. As expected, the “outcome” of this policy is a high share of technology-driven and skill-intensive industries.

The big continental countries (Germany, France and Italy) spend more on state aid. Regulation is medium to high. France and Germany have moderate to good positions in research expenditures, while Italy is performing rather poorly. But even France and Germany are trailing in terms of the dynamics of research expenditures, and life long learning, broadband penetration and ICT expenditures are below the EU average.

A group of small continental countries including Belgium, the Netherlands and Austria has low expenditures on state aid. They engage in administrative regulation, but less in economic regulation.¹⁰ These countries are short of venture capital and have a low share of science and engineering graduates. They have a moderate position in research and a slightly better position in information technology, leaning towards incremental innovation and technology diffusion. The share of technology-driven and skill-intensive industries is smaller than would be expected from the high levels of GDP per capita in these countries.

Finally, southern peripheral countries like Spain, Portugal and Greece spend a lot on state aid and have rather strict regulations and low levels of investment into the future. The share of sophisticated industries is low.

Aiginger and Sieber (2005) show that the input-outcome relation of different types of industrial policy conforms to expectations: low state aid, less regulation, and higher investment into the future correlate with positive “outcomes”. The intended outcome of industrial policy is measured by (1) high shares of technology and skill intensive industries, (2) good performance in terms of the Lisbon rankings and (3) macro-economic performance (high growth and employment rates). The correlation between inputs and outcomes is a positive and reassuring result, favourable for a future-oriented industrial policy approach, even though we must stress that simple correlations do not prove causality.

⁹ Research strategies to provide an empirical evaluation of industrial policy are reported in Noland and Pack (2003).

¹⁰ “Administrative regulation” is measured by such indicators as licence and permits systems, administrative burdens for corporations, public ownership of firms or sector specific administrative burdens. “Economic regulation” refers to the scope and size of the public enterprise sector, the degree of direct control over business enterprises, and the existence of legal barriers or antitrust exemptions (OECD 2005).

4.2 The renewed interest

Industrial policy had become very unpopular by the last decade of the 20th century—not only, but specifically in Europe. The strong sectoral focus had been abandoned earlier; even in France, large industrial projects were abandoned in the nineties, partly because French policy called for European projects to take the place of the national “Grand projects” (see Cohen 2007). The horizontal approach had been explicitly mentioned in policy documents, but at the same time began to lose its role as a separate policy strand, instead merging with policies improving the “competitive environment” and “framework conditions”.

Renewed interest in industrial policy emerged at the turn of the century. Industrial policy has again become a topic of interest in development policy. The European Commission ordered a background report on industrial policy in its regular research contract with WIFO on the competitiveness of European manufacturing (Aiginger and Sieber 2005). The Enterprise and Industry Directorate of the European Commission initiated a series of working papers on industrial policy and economic reform and developed a new matrix type approach.¹¹ The Beffa Report delineated a new approach to industrial policy in France; the Nakagawa Report (*METI* 2004¹²) did the same for Japan. Rodrik (2004, p. 1) states that developing societies need to embed private initiative in a framework of public actions that encourage restructuring, diversification and technological dynamism beyond what market forces on their own would generate.

Four reasons may explain the renewed interest in industrial policy at the turn of the century:

- Globalisation on the one hand eliminated some traditional policy instruments (tariffs, subsidies, local content requirements), and on the other hand increased the speed of change and dynamics of many economies. Fears emerged in rich countries (the US and Europe), that some core industries would shift to low-cost countries. This might lead to de-industrialisation, outsourcing, and unfair competition due to low wages and social standards or ecological dumping. Low-income countries tried to attract foreign direct investment and to promote exports, but questioned whether the foreign firms would not only maximize profits and exploit resources at low costs and without environmental concerns. The burden of change is known not to be distributed equally in the process of globalisation; income differences could increase and less mobile and qualified workers needed to be trained.
- The Lisbon agenda of the EU sets a target of a 3% growth rate and the goal of becoming the most competitive knowledge-based region in the world. While it is far from realisation the goal of dynamic competitiveness and many of its sub targets (for research expenditures, universities, employment rates, lifelong learning) can be perceived as an agenda for a new industrial policy.
- Economic growth slowed down in Europe, dropping to rates between 1% and 2% during the period 2000/2006, while unemployment remained persistently high. The Internal Market Programme in general, as well as privatisation and deregulation did not contribute to growth and employment as fast as expected.
- Following a period of abstinence from interventions, the new member countries paid increasing attention to the structure and dynamics of the industrial sector. Complemen-

¹¹ See below; the term “matrix type approach” was proposed by Aiginger and Sieber (2005).

¹² Available at <http://www.rieti.go.jp/en/events/bbl/04070101.pdf>

tary domestic firms and capabilities should prevent monolithic industry structures. The Lisbon agenda has generated the opportunity to reconsider strategic issues for catching-up economies, without causing a return to socialist planning (Török 2007).

4.3 A new concept: the matrix type of industrial policy

The European Commission designed a new industrial policy, emanating from the necessity for structural change, the fear of de-industrialisation and the reshaping of the economic landscape due to European enlargement and globalisation. The essence of the new approach is that although industrial policy should maintain its horizontal nature and aim to promote the framework conditions necessary for competitiveness, the specific needs and characteristics of individual sectors must also be taken into account. It is acknowledged that the impact of horizontal policies on specific industries will vary. Complementary measures—differing across industries—may be needed. Aiginger and Sieber (2005) therefore call this approach a “matrix type” of industrial policy, since the horizontal lines (the rows) are sectors (or industries) and the vertical columns denote the instruments. The boxes—defined by one row and one column—show whether a policy is important in a specific industry or not. A supplementary column indicates complementary policies needed in an industry (or sector).¹³

Box 1: The matrix approach to industrial policy as found in recent EU documents¹⁴

European Commission (2002B):

“Industrial policy is horizontal in nature and aims at securing framework conditions favourable to industrial competitiveness. Its instruments, which are those of enterprise policy, aim to provide the framework conditions, in which entrepreneurs and business can take initiatives, exploit their ideas and build on their opportunities.

However, it needs to take into account the specific needs and characteristics of individual sectors. It therefore needs to be applied differently, according to the sector. For example, many products, such as pharmaceuticals, chemicals, automobiles, are subject to detailed sector-specific regulations dependent on their inherent characteristics or use.

Industrial policy therefore inevitably brings together a horizontal basis and sectoral applications.”

European Commission (2004A):

“The Union must continue to develop the sectoral dimension of industrial policy. This implies analysing the effectiveness at a sectoral level of policy instruments which are of a horizontal nature, with a view to evaluating their relevance and to propose, if necessary, the appropriate adjustments. The Communication presents the sectoral initiatives that have already begun over the last few months and announces several new initiatives in sectors such as the car industry or mechanical engineering.”

European Commission (2005A):

“The Commission is committed to the horizontal nature of industrial policy and to avoid a return to selective interventionist policies.For industrial policy to be effective, account needs to be taken of the specific context of individual sectors. Policy needs to be combined in a tailor-made manner on the basis of the concrete characteristics of sectors achieving policies that are more relevant, integrated and consensual.

This approach mitigates the old dichotomy between sectoral and horizontal policies. On the one hand, the horizontal approach maintains the position in the driver’s seat of the

¹³ For more documents on industrial policy of the EU see European Commission (1970, 1990, 2001, 2003A, 2003B) and Grilo and Koopman (2006).

¹⁴ The communiqué “Industrial policy in an enlarged Europe” (European Commission 2002B) is the basis of a new policy design. The communiqué “Fostering structural change: an industrial policy for an enlarged Europe”, European Commission(2004A, B, C) calls for action in three areas: a better regulatory environment for business, better mobilisation of all EU policy, further work on individual sectors to match specific need. European Commission (2005A, B) proposes a new sector taxonomy (which we call the matrix taxonomy).

agenda, i.e. measures are general, rather than industry-specific or selective. On the other hand, it is acknowledged that the effects of broad horizontal policies can vary significantly from industry to industry. To bring a few examples: innovation policy and patent policy have a stronger impact in technology-driven industries; knowledge is more important to skill-intensive industries; basic research is of greater necessity to industries using new genetic technologies like biotech than to mature industries; similarly, deregulation has a higher impact in strictly regulated industries like biotech, and a weaker impact in the textile industry.

4.4 The “matrix taxonomy” of industrial sectors in detail

In order to facilitate the sector dimension, the European Commission additionally developed a new aggregation of industries into broad sectors. Industries corresponding approximately to the three digit level of the NACE classification are clustered into four broad sectors for the ultimate purpose of evaluating and fine-tuning industrial policies. The aggregation should be performed in such a way that each of these four broad sectors are “characterised by their own distinctive set of challenges” (European Commission 2005A).

The “matrix taxonomy” breaks down European manufacturing into four “industrial sectors”:

- Food and life science industries
- Machine and systems industries
- Fashion and design industries
- Basic and intermediate goods industries

We analyse the share and dynamics of these sectors and compare these results with the results provided by the analyses using the Peneder taxonomy focussing on factor inputs (Peneder 2001).

The largest sector is the “*basic and intermediate goods industries*”. This sector includes chemicals, steel, pulp and paper, and accounts for some 40% of the value added of European manufacturing. Growth rates range from medium to low (but are high in

Table 3 Structure and growth in sectors according to the matrix taxonomy

EU matrix terminology	Share of value added								Difference in shares		Growth rate
	1995				2004				EU 15 2004–1995	EU vs USA 2004	2004/1995 ¹ EU 15
	EU 15	USA	Japan	NMS	EU 15	USA	Japan	NMS			
Machine and system industries	31.6	34.0	38.8	22.0	32.7	38.0	39.5	28.1	1.1	-5.3	2.5
Fashion and design industries	9.5	8.1	7.1	11.1	7.7	7.3	6.3	8.1	-1.8	0.4	-0.2
Food and life science industries	16.9	18.8	15.8	26.2	18.4	18.0	17.1	21.0	1.5	0.4	3.1
Basic and intermediate goods industries	42.0	39.0	38.4	40.7	41.2	36.6	37.0	42.8	-0.7	4.6	2.0
Total manufacturing											2.2

Remark: NMS=New member states, EU 15=members before enlargement as of 2004. ¹Growth p.a. of nominal value added; Source: WIFO calculations using Eurostat (AMECO)

chemicals and the rubber industry); average growth is 2% p.a., slightly less than the total growth of manufacturing (Table 3). The main challenges—according to European Commission (2005A)—relate to energy and the environment. Regulation is important (for example in chemical industry) but also legislative simplification (for example in the construction industry). The share of this sector in total manufacturing is much higher in the EU 15 than in the US (41.2 versus 36.6%) and not surprisingly, is highest in the new member countries (42.8%). It is relatively stable in the EU 15, declining in the US, and still increasing in new member countries.

The second largest sector is “*machine and systems industries*”: this sector includes ICT and mechanical engineering and thus is the most sophisticated sector, including many industries labelled as high tech or technology-driven in other terminologies. It makes up one third of value added and is also characterised by medium and high growth rates. Important general challenges are innovation, property rights and skills. Sector specific challenges have to do with standards and the updating thereof. Better access to international markets is specifically important to some sub sectors, as is environmental performance specifically to vehicles. Its share in the value added of manufacturing was 32.7% in 2004 (EU 15), less than that in the US and higher than in the new members. The share of this sector is increasing slightly, but the distance to the US is widening, thus emphasising an important and grave problem of European structure.

Box 2: Comparing the matrix taxonomy with the Peneder taxonomy

The matrix taxonomy highlights some well known factors defined in other studies on sectoral competitiveness. Specifically, we compare the results according to the matrix taxonomy approach with the results derived from the Peneder Taxonomy (Peneder 2001), classifying industries according to their main factor inputs. This approach was derived on the one hand from a statistical cluster analysis and on the other hand is well based on theoretical considerations. It is increasingly used in documents on competitiveness and growth, and is a rather sophisticated standard of comparison.

First, the matrix taxonomy replicates the relatively low value added share in sophisticated industries in Europe. The share of technology driven industries is shown to have been 21.1% in the EU 15 in 2004 according to the Peneder taxonomy, nearly 10 percentage points below the corresponding share in the US (30.3%). The most sophisticated sector in the matrix taxonomy is the machine and system industries. Its share in Europe is 32.7% relative to 38.0%. The structural deficit of the new member countries is shown to be larger in the Peneder taxonomy than in the matrix taxonomy, due to the good position of the new member countries in the machine industry.

Secondly, both typologies underscore the fact that sectoral change in the direction of sophisticated industries is slower in Europe than in the US. In the US, the share of technology driven industries increased between 1995 and 2004 by nearly four percentage points, in Europe by one percentage point. The same is true for machine and systems industries, which increased by four percentage points in the US and only very slightly in the EU 15. The same direction of slow structural change indicates that the already low share of labour intensive industries in the US is decreasing by half a percentage point, the same absolute change as in the EU 15 and a little bit more than in the new member countries. The share of slow growing capital intensive industries is decreasing slightly in the EU 15 and in the US. This tendency is replicated for the sector of basic and intermediate goods in the matrix taxonomy.

Peneder’s taxonomy underscores the good position of Europe in medium skilled industries (called mainstream), while the matrix taxonomy underscores the high and rising shares of the food and life sciences sector. However, the share of this sector is highest (and fastly decreasing) in new member countries, reflecting the heterogeneity between high value added and rather traditional sub-sectors.

This leads to a comparison of heterogeneity within sectors and between sectors. For Peneder’s taxonomy, the heterogeneity within sectors—if measured by growth differences in value added—is largest for technology driven industries and for capital intensive industries; in both it is still lower than the average growth of the sectors (thus leading to a covariance below unity). For the matrix taxonomy, it is largest for food and life sciences—here also justified by high average growth and below unity covariance, but it is also large for

fashion and design industries, with a declining share in value added in the EU 15.

The standard deviation across the sectoral growth rates is far less for the Peneder taxonomy ($sd=0.36$) than for the matrix taxonomy (1.43). This holds for the EU 15, for the US and for the new member countries.

“*Food and life science industries*” comprises only 18% of manufacturing, but is the fastest growing sector. This sector is also very heterogeneous: it combines the rather traditional food and drink industry with pharmaceuticals and biotech. General challenges, specifically important to this sector, are knowledge and better regulation. Sector-specific challenges are a “fully competitive single market for pharmaceuticals and environmental and market access issues related to the food and drink industries...” Its share in the value added of manufacturing is about the same in the EU 15 and in the US (18.4 versus 18.0% in 2004). The share has increased in Europe by 1.5 percentage points since 1995, decreasing slightly in the USA and strongly in the new member countries. The most dynamic sector in the EU 15 are pharmaceuticals, medicinal chemicals and botanical products (5.7%). Employment in absolute figures is constant (464,000 persons), its relative share is increasing (from 16.1 to 17.4%) and is now five percentage points higher than in the USA.

“*Fashion and design industries*” comprise textiles and footwear. It is the smallest sector and accounts for “just 8%” of value added and has “experienced low or negative output growth and relatively low R&D spending over recent years”. Successful structural adjustment is the key challenge. Improving innovation, property rights, and skills are the preconditions for a quality upgrade. Better access to the heavily protected world market is “also a key policy requirement”. The share of this sector in manufacturing is approximately equal in the three regions; its share in value added is below 10% and decreasing in all regions. This highlights the problem that the EU 15 cannot keep the share of textiles and apparel constant in value added by increasing quality and adding fashion components. New member countries are not specialising in these low growing labour intensive industries. Employment is decreasing by 2.9% per year in the EU 15 (Table 4).

4.5 A first application by the commission

The Commission defines horizontal policies, whose impact on 27 individual sectors of manufacturing are then investigated. The policies are the columns in the “matrix”, the industries are the rows:

- Knowledge, such as research, innovation and skills,
- Better regulation,
- Environment and energy policies,
- Ensuring full and fair participation in global markets (trade).

The importance of each of these policies to individual industries is then investigated. For example, knowledge is important to many sectors, but not to cement and non ferrous metals. Furthermore, the existence of sector specificities, such as the importance of financial instruments to shipbuilding or GMO¹⁵ to biotech or access to land in extractive industries, is analysed. For some industries, additional industry specific actions are introduced, such as a Pharmaceutical Forum for the pharmaceutical industry, or a dialog for mechanical engineering or an innovation panel for automotive industries.

The results of these investigations are summarised in Zourek (2007, Annex 1). The columns of the matrix are horizontal measures (knowledge, better regulation, environment and energy, trade); the number of columns is enlarged by structural change, sector

¹⁵ Genetically modified organism.

Table 4 Growth and diversity in sectoral terminologies

	Growth of value added 1995/2004	Standard deviation of growth	
		Across industries	Across EU countries
Peneder taxonomy			
Mainstream industries	2.0	2.1	1.9
Labour intensive industries	1.9	1.9	2.3
Capital intensive industries	1.9	3.6	5.0
Marketing driven industries	2.2	2.5	2.7
Technology driven industries	2.8	2.9	2.8
Standard deviation across sectors	0.36	0.66	1.22
EU matrix taxonomy			
Machine and system industries	2.5	2.3	2.7
Fashion and design industries	-0.2	2.4	2.4
Food and life science industries	3.1	1.3	3.6
Basic and intermediate goods industries	2.0	2.4	1.8
Standard deviation across sectors	1.43	0.51	0.75
Total manufacturing	2.2	2.5	11.56

Source: WIFO calculations using Eurostat (AMECO); Peneder (2001).

specificities, and sector actions, and each main column is subdivided into sub columns. The rows are the four sectors according to the matrix taxonomy, subdivided into 5 to 10 industries. Crosses in the boxes show whether a policy is important in a specific industry. Zourek (2007, Annex 1) indicates why the term “matrix approach” might be a good term for the new approach applied by the European Commission.

4.6 Assessment of the new European strategy

It is definitely too early to assess the applicability of the new approach. At least it mitigates the ideological divide between horizontal and vertical policies. And it puts many elements of the Lisbon Strategy and of the National Lisbon Plan into a framework. The new approach definitely characterises a more pro-active policy approach as compared to a “framework conditions only” approach. In its emphasis on including business groups in the discussion process, it resembles the de facto industrial policy in the US built on “business round tables”. The necessity to pick winners is explicitly rejected (Zourek 2007), and the new approach does not mention the selection and promotion of large industrial programmes. Developing clusters, industrial cores or competitive centres is not explicitly discussed, but could be the national or regional complement to this community-wide policy. The new approach is far from the French style top-down approach and “Grand Projects”.¹⁶ The emphasis on innovation in the life sciences on the one hand, and on structural adjustment in the fashion and design industries on the other hand, illustrates the differences between growth industries and those in decline.

There is no change in the rationale behind the industrial policy of the European Community. This has been based on static and dynamic market failures and does not go

¹⁶ For an overview of the French approach, see Alcouffe (2005) or Cohen (2005). Outstanding examples of the “French approach” are Airbus, Concorde, Minitel, HDTV, and TGV. Often, supporting the space industry and energy is also project-oriented, or follows a specific strategy with a strong top-down component.

beyond. Public authorities were to act “only if needed i.e. when some types of market failure justify government intervention”. The policy is to promote structural change insofar as authorities should act “... in order to foster structural change”. It is also responsive to political arguments, as it proclaims to “reduce the social costs of change”. It favours “employment and social policies that generally apply across the economy and the facilitation of social and economic cohesion”, thus promoting the Lisbon strategy.¹⁷

5 Elements of a New Industrial Policy that complements globalisation

5.1 Renewed interest in a policy different from the past

The interest in industrial policy has recently re-emerged, although not for industrial policy as it used to be. Supporting ailing industries, subsidies, and preventing exit will never be completely abandoned, but they are no longer supported by policy makers, evidence, or economic theory. Fortunately, traditional industrial policy has become much more difficult thanks to trade agreements, community law and WTO.

Picking winners also proved difficult, be it favouring national champions or selecting narrowly defined “future industries”. And there will be no heyday for “grand projects a la France”. Nourishing champions and creating grand projects required a specific combination of intervention, finance, and management which is no longer feasible, neither for a member state of the EU nor for the community itself, nor for firms financing and selling world wide (Cohen 2007). There will also be no selection of industries, which are so “strategic”, that local or national production must be maintained, since importing is impossible. This is true for manufacturing, but extends to telecom, energy, construction and most services. Whether rules for education, media, “essential services”, security and defence, and water will be different is open to intense discussion, but these areas are outside of industrial policy proper. There may be exceptions in developing countries, which might strive to prevent the development trap, to uphold industries which are not competitive today but produce goods with high income elasticity. Some repercussions of the infant industry argument will always be present. And it makes sense that countries with important but exhaustible natural resources will build reserves, promote skills and finally industrial clusters for the time after. What will probably stay on the agenda longer is that each country wants a fair share of headquarters and a balance between outward and inward FDI—a balance which should change as per capita income rises (compare the five stages of development in Dunning 1981). Consequently questions of “national” ownership in flagship firms will not disappear all too quickly, and industrial policy should be the tool used to achieve this balance without direct intervention—by making locations attractive for headquarters and competence units.

5.2 Objective: dynamic competitiveness

New Industrial Policy will focus on supporting the transition of existing structures into the knowledge based society. This is a concept explicitly used in Finland (Ylä-Anttila and Palmberg 2007). It is also at the not so visible heart of the Lisbon Strategy of the European Community. This is accomplished at the strategic level by documents, agendas, long term projections, and White Books, which indicate the direction in which economies would like

¹⁷ For a recent assessment of the matrix type industrial policy by the European Commission see European Commission (2007).

to develop. These National or Regional Strategies—sometimes even called Development Plans or Programmes—demand far less commitment than former socialist planning, and are even a far shot away from the former technocratic planning of MITI in Japan or indicative planning in France. They analyse the most probable development, given the information about other countries, technologies, trends in trade and division of labour. Then they analyse capabilities, competitive and comparative advantages, strengths and weaknesses. All this is done in a forward-looking way, experts, government and stake holders are involved in the process. Strategies or programmes then indicate how to reach a favourable position within the corridor of likely developments.

The role of a new industrial policy is to encourage activities with positive spillovers, creating “good” institutions, providing pro competitive regulation. The objective of the strategies is often framed in terms of “fostering the dynamic competitiveness” of regions, industries and countries. This goal can be different for advanced regions, developing countries or catching-up economies. It is however very different from the notion of price competitiveness, which has been interpreted often in a very short-term perspective and has been misused for business interests and for curbing social and ecological responsiveness (and therefore criticised by Krugman 1994A). Dynamic competitiveness is the ability of firms, regions and countries to increase economic growth, to make use of and to develop the given resources, and to comply with the long run objectives of a high income region, in short “the ability to create welfare” (Aiginger 2006).¹⁸ Competitiveness built on low costs, wide income disparities between persons and regions, a low level of social security and ecological deprivation is not a meaningful strategy. Efficient, profitable and competitive firms are the precondition for developing the social system and financing sustainability. Dynamic competitiveness may be a distant cousin to the “framework” approach of industrial policy, but is more dynamic and pro active.

5.3 Reassessing the rational

Additional theoretical support for a substantial role played by Industrial Policy has its origins in “new trade theory”, “new economic geography” and the “new” as well as “evolutionary” growth theory. These “new” strands highlight the importance of scale economies, on the plant level and on the firm level, the importance of learning, the role of proximity and agglomeration, the quality of inputs, the role of formal and tacit knowledge, of discovery and innovation. The theories underline the importance of first mover advantages and path dependency. On the empirical field, support comes from the fact that the US enjoys the highest level of productivity with a very specialised industrial structure (Ketels 2007), and that the specifically successful Scandinavian countries are also specialised in quite a few knowledge and technological intensive industries. In Sweden and Finland, the government has provided public goods, basic research and a helpful innovation system. The interventions justified by new theories are far from uncontroversial. Interventions called for by strategic trade theory—not dissimilar to the old List arguments for the protection of infant industries—are now nearly unequivocally dismissed for developed countries. Government failure may be more severe than market failure, and the costs of interventions have to be calculated.

¹⁸ Trying to be the most “competitive knowledge-based economy” with regard to cohesion, and social and ecological responsibilities, as stated as a Lisbon target of the EU, is a specific version of this concept of competitiveness.

The rationale for interventions shifts from static market failures to dynamic externalities, be it research or knowledge spillovers, learning curves and network externalities. Public goods—such as basic research for new generic technologies, physical and intangible infrastructure—will not be provided by the market automatically, due to lock-in problems, co-ordination failures and information externalities. Here, some flavour of the old grand project reappears in the quest for radically new technologies (the European Satellite Navigation System, the Earth Discovery Programme etc.) In general, there is a consensus that externalities and spillovers are “abundant” in technology driven industries and in economies approaching the knowledge-based society. This opens a wide space for a pro market industrial policy that increases welfare and is based on dynamic externalities, co-ordination failure and new generic technologies with public goal characteristics. However, the justification for intervention is limited, since the size and nature of the externalities are highly uncertain.

5.4 Beyond externalities: aware of limited knowledge, but not naively ignorant

Correcting market failures looks innocent, even if market failures are dynamic. However, market failures are also pervasive, difficult to measure and even more difficult to correct. Nevertheless, systemic industrial policy will probably go beyond combating market failures parallel to any prudent firm strategy which has to be more forward looking and proactive, instead of correcting only existing failures and weaknesses. Industrial policy needs a vision depicting the future development of an economy, the competitive strengths and the best attainable position of the country—taking into account the fact that other countries are also trying to improve their positions. This long-term view, which includes all arguments of a society’s welfare function helps to sharpen the analysis of the current position. Then policy makers, experts and firms can analyse current strengths and weaknesses, and existing comparative advantages. But the main point is that comparative advantages are themselves not static. The research base and knowledge can be developed and enlarged, and comparative advantages, spillovers, and positive externalities can be shaped and increased. Industrial policy then not only internalises externalities, but also produces externalities.

Past failures teach us to be cautious in our assumptions about the knowledge of firms, experts and the government; we should refrain from relying on the supposedly superior knowledge of one group versus another. However, some trends and economic rules are highly likely to prove true—e.g. that rich countries cannot build their strengths on low input prices, that the composition of demand and of production changes with rising incomes, that the ability of countries and firms to develop and apply new technologies fosters competitiveness, that human capital is a precondition for implementing new technologies, and that defending old positions and past advantages increases the future costs of change. No agent in industrial policy has a crushing superiority as to knowledge about the future. Public agents and firms, as well as experts, have different, complementary information; they also have different priorities, self-interests and horizons. They learn from each other and a systemic industrial policy can co-ordinate actions, hopefully without being captured by vested interests and corruption. Public authorities do not have to maximise the profits of existing firms, but include aspects of social cohesion, full employment, and the environment, all factors that do not appear in the profit and cost statements of private firms, thus adding value to the optimal decision of profit maximising firms—given a definition of competitiveness or welfare maximisation which includes social and ecological goals (Aiginger 2006).

5.5 Depending on position relative to the frontier

New industrial policy will differ according to a country's position in the per capita hierarchy and its role in the world wide division of labour. In developing societies, it will foster industrialisation and technology transfer via FDI industrial policy will provide infrastructure, education and basic industrial skills. After the take off phase, it will enhance domestic entrepreneurs, firm clusters and knowledge. In catching-up economies, industrial policy has to offer attractive business locations and physical infrastructure. It makes the locations more attractive for the production of goods with higher value added, enlarging the science and innovation base, and offers low and “flat” taxes and special zones. In high income countries, it merges with innovation policy, and offers excellence in higher education, universities and research centres. Different locations should attract different types of FDI; specific industries need different complementary services and inputs. This may lead to a reminder of sectoral differentiation, based however on very broad sectors, which might depend on resources (labour intensive versus research intensive). Differentiation may however also come from strengths and weaknesses. While the strategic development aspect on the national level is often criticised as too demanding and too much like planning, it is widely accepted or supported on the regional level (as clusters or “poles of competitiveness”). The European Union, for example, demands regional money to be spent only if regional development strategies are developed and approved by the Commission.

5.6 Merging with innovation policy in frontier economies

In frontier economies, industrial policy merges with innovation policy, science and technology policy and education (Soete 2007). The competitiveness of developed countries at the technology frontier depends on skills, research capacity, innovation systems, institutions favouring change and life-long learning. New industrial policy will not be a policy that stands alone; it will be more systemic and interwoven with other policies, shaping and shifting competitive advantages in the direction needed due to globalisation and income position.

Many governments have one minister jointly responsible for Industry and Technology. Subsidies for physical investment are forbidden, tax credits for research exist, and technology projects can be funded by public money partly in top down, partly in bottom up programmes. Science parks, excellent universities blossom, venture capital and seed financing is provided, and the generation and exploitation of patents is high on the agenda.

5.7 Everywhere: the missing complement to globalisation

The role of industrial policy is shaped and enhanced through globalisation. It is well known that globalisation—like all processes dealing with integration and the opening of trade—will in the long run and performed under fair rules—increasing the income and welfare of rich as well as poor countries. Since the real world does, in fact, contain many distortions, system changes and policy interventions, and since real world players are very different in size, knowledge and power, the advantages of globalisation will not necessarily dominate over the short run and in all countries. It is also well known that within countries, there are winners and losers of globalisation. Gains should be higher than losses, but the losers are usually not compensated, and losers often coincide with the weaker, less educated, less

mobile groups. Industrial policy plays an important role as a complementary policy to globalisation. It could help countries to attract foreign firms, and to connect them with the existing infrastructure or domestic firms. Industrial policy should encourage the growth of indigenous firms using technology and knowledge spillovers, while the domestic infrastructure is modernised. Industrial policy ensures that the possible and likely advantages of globalisation will materialise, that the burden of change is minimised and potential losers are retrained and switched to prospering activities. Industrial policy thus has to promote the gains of globalisation and help to distribute the burden in a fair way. Re-qualification, the shifting of employees from activities which are now imported to activities in the export sector is becoming an essential part of industrial policy. A future-oriented, proactive structural policy minimises defensive subsidies, income transfers and similar passive measures otherwise needed for the persons disadvantaged by globalisation.

5.8 Industrial policy is consistent with—if not the main pillar of—the Lisbon strategy

Industrial policy plays a crucial role in high wage countries, also. Dynamic competitiveness is the objective of the Lisbon Agenda, according to which Europe is striving to become the most competitive knowledge-based society. Many of the sub-goals (targets for R&D expenditures and university financing, education attainment rates, employment goals) as well as a significant part of the “Broad Economic Guidelines” can be subsumed under industrial policy. Consequently, the lion’s share of the so-called National Action Plans, which must be supplied by all member countries and which are monitored by the Commission annually, refer to industrial policy measures. Thus, globalisation creates the need for a new industrial policy world wide, and the Lisbon Strategy specifies policy actions to help make EU member countries competitive in the knowledge-based economy.

The concept of a New Industrial Policy is thus not only in line with the Lisbon Strategy. It can also be seen as one of those policies necessary for the achievement of the output goals of the Lisbon Strategy, namely growth, social cohesion and ecological responsiveness. A future-oriented industrial policy, as well as a strategy striving to meet these three goals, relies heavily on research, innovation, education and life-long learning.

5.9 Regions and clusters as substitutes for the old sectoral component

Two trends are very visible and will continue: The regionalisation of industrial policy—specifically in large countries—and the way in which regional policy is following the cluster approach (Porter 1990; Ketels 2007). Clusters are based on existing agglomerations and strength. Sometimes, strategies decide between existing and stable clusters on the one hand, and emerging or future-oriented (sophisticated, high-tech) clusters on the other hand. In this case, cluster policy comes close to being a sectoral policy in disguise. But cluster policy does not discriminate as such; instead, it has a meaningful, time-restricted focus on those industries where investment generates the highest impact on value added.

Sectoral issues will never be completely absent from industrial policy. Even the impact of favouring broad activities is now known to depend on the importance of that activity (as an input or in defining the competitive edge). Secondly, the existence of scale economies, as is underlined by all the “new theories”, advocates the idea that the promotion of existing strengths might be easier or less costly than supporting everything (or even trying to wipe out existing specialisations). Each firm tries to build on existing advantages and capabilities. This is usually a good strategy for regions (and is advocated by regional

economies through specialised inputs, knowledge spillovers etc.). Even an industrial policy that focuses on establishing a favourable framework has to acknowledge that the framework conditions can be cluster specific (as, in fact, they increasingly are in modern economies; Ketels 2007). All programs in the technology field define promising research areas and have top down elements; in smaller countries, the same holds true for national research programs.

5.10 No selection of future sectors, but fine-tuning of measures: towards a matrix type approach

The European Commission, which has long favoured a primarily horizontal approach to industrial policy, expressed in its recent communications (see Box 1 and also Zourek 2007) interest in a more balanced matrix type approach. The new approach maintains that industrial policy should promote horizontal measures to increase competitiveness in all industries. However, it also acknowledges that the impact of each instrument will vary according to sector. Individual sectors each have their own specific inputs, and competitive advantages have different sources. The impact of globalisation is not the same everywhere and the new, general purpose technologies are becoming more differentiated as they mature. In the globalising world, the factors determining the competitive edge on the industry level are changing, as is the search for policies complementing the horizontal approach. A new industrial policy, which makes use of the matrix approach, is therefore a horizontal policy, aware of its varying sectoral impact and acknowledging that the competitive advantage in specific industries is defined by various determinants. The broad measures therefore require different complementary measures in individual industries.

5.11 Competition, openness and control are the principles of a new industrial policy

Even if sectoral discrimination is not popular, and large national projects are no longer favoured, there is always a case for research priorities, for top down policies and for core technology projects. This is specifically the case in France, where the general feeling is that technological progress has slowed down, since the stimulus of the grand projects has been reduced in order to increase the conformity of French industrial policies with EU policies (Cohen 2007). Research strategies in all countries and on the EU level (e.g. the European Framework Programs) try to specify priority areas and broad topics for the purpose of not spreading money too “thinly” over an indefinite number of small projects. Specifying national priorities in research strategies is quite far from a sector-based approach, but is in principle also a top–down approach, discriminating between areas. What has changed in relation to the past and what will be different in a new industrial policy is that core projects and national priority programmes have to be more transparent, open to tenders and international co-operation. Success is being evaluated on both the national and international levels. European-wide technology programmes (like Galileo, ESA, VGME¹⁹ and the “Earth Discovery Program”: Observing the Earth) are not subject to the danger of creating new borders within Europe, but are part of a European research agenda. In general, competition and tendering for funds on the national level, as well as on the international level, is a feature of a new industrial policy merging with innovation policy. Old industrial policy was often in conflict with competition policy, while competition and tendering is a

¹⁹ VGME=Global Monitoring for Environment and Security.

core element of a new industrial policy, specifically when industrial policies extend to research grants, university funding, the creation of centres of excellence, clusters etc.

5.12 Systemic Industrial Policy in a nutshell

The goal of the new Systemic Industrial Policy (SIP) is to promote the dynamic competitiveness of a region or country in the sense of growth, social cohesion and environmental responsiveness. It is the operational arm of the Lisbon Strategy and other national development strategies. In addition, it provides the basis for a national (or regional) policy strand that complements globalisation.

The new Systemic Industrial Policy is not a “stand-alone policy”, promoting just manufacturing or parts of it, but rather has an impact on a wide range of industries, including services, in their existing economic and social environments. It makes use of and develops synergies with other policy strands, such as education, innovation, regional policy, competition policy, labour relations, and health. The policy strands with the largest synergies may change with the distance to the technology frontier. The greatest synergies may be with education, liberalisation, and finally innovation policy.

Systemic Industrial Policy needs the broad support of economic and policy agents. It makes use of and shapes institutions; it extracts knowledge from and co-operates with firms. It has, however, expressed an awareness of the importance of not being captured by vested interests. If it is to be successful, it has to build on a long-run consensus, a vision in which an economy or a region must move, including stakeholders and experts in economics, business, education, social affairs and the environment. Since the horizon of SIP is long run, the knowledge needed for policy formation does not have to be so specific that Systemic Industrial Policy lacks the knowledge needed for future-oriented strategies. A more interventionist industrial policy, like sectoral fine-tuning or supporting ailing firms, requires much more knowledge on the side of the government.

The new SIP goes beyond focusing on the internalisation of positive externalities and spillovers, which are abundant and dynamic in the knowledge-based society. It promotes and shapes externalities and capabilities, specifically those important to the respective region and the current stage of development. It does not claim to have perfect foresight, but does make use of knowledge on broad trends and factors defining competition and comparative advantages. It provides the capabilities necessary for tomorrow’s competitive position, enabling countries to climb up the quality ladder or shift frontiers. Thus, SIP is far more than simply shaping the static framework conditions and then sitting back to wait for the results.

SIP is the necessary complementary policy strand to globalisation. Globalisation, as well as the opening of borders, increases welfare, although there is the danger and even high probability that there will be winners and losers. There will be no compensation for the losers, and not all groups will be able to reap the benefits. Furthermore, globalisation does not recognise regional differences in development, preferences and culture. Systemic Industrial Policy broadens and upgrades education, retrains the losers, connects the local education system with the needs of international firms, and empowers people and firms to take advantage of changes. It develops and enlarges the bases of domestic firms and connects them with the multinationals.

In comparison with old industrial policy, systemic industrial policy will place less emphasis on

- Restructuring,
- The support of ailing industries,

- Policy-oriented arguments,
- The selection of narrowly defined future industries, grand projects, or national champions
- Physical investment (subsidies).

And it will rely more on

- Long-run trends in development,
- Regional policy clusters,
- (Intangible) infrastructure, co-operation between firms, experts, policy agents (stakeholders),
- Knowledge as the main instrument of transformation,
- Externalities (innovation, education, lifelong learning),
- Incentives, retraining, social and ecological goals,
- Technologies with double dividends,
- Trans-national initiatives.

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Appendix

Definitions of industrial policy

Author	Definitions of Industrial Policy
Curzon Price, V., “Industrial Policies in the European Community”, 1981	“Industrial policy may be generally defined as any government measure, or set of measures, to promote or prevent structural change.”
Adams and Klein, “Industrial Policies for Growth and Competitiveness”, Lexington Books, 1983	Industrial policy includes “everything which is useful to improve growth and competitive performance”
Jacquemin, A., Industrial Policies and the Community in Coffey, P., Nijhoff, M. (ed.), Main Economic Policy Areas of the EEC, 1983	Industrial policy “has to specify and solve the problems of structural change in the economy. Its task is to create optimum conditions for the necessary structural transformations to be carried out.”
Tyson, L., Zysman, J., “American Industry in International Competition: Government Policies and Corporate Strategies”, 1983	“Industrial policy ... means government policy aimed at or motivated by problems within specific sectors.”
Johnson, Ch., “The Idea of Industrial Policy”, in Johnson, Ch., “The Industrial Policy Debate”, 1984	“Industrial policy means the initiation and co-ordination of governmental initiatives to leverage upward the productivity and competitiveness of the whole economy and of particular industries in it.”
Graham, H., “European Industrial Policy”, Croom Helm, London, 1986	“Industrial policies refer to those policies intended to affect in some ways manufacturing or service industries.”
Geroski, P.A., European Industrial Policy and Industrial Policy in Europe, Oxford Review of Economic Policy, Vol. 5, 1989	Industrial Policy is “wide-ranging, ill assorted collection of micro-based supply initiatives which are designed to improve market performance in a variety of occasionally mutually inconsistent ways.”

(continued)

Author	Definitions of Industrial Policy
Krugman, P., Obstfeld, M., "International Economics Theory and Policy", 1991	"Industrial policy is an attempt by a government to encourage resources to move into particular sectors that the government views as important to future economic growth."
Chang, H.-J., "The Political Economy of Industrial Policy", St Martins's Press, 1994	Industrial policy is one "aimed at particular industries (and firms as their components) to achieve the outcomes that are perceived by the state to be efficient for the economy as a whole."
Sharp, M., "What is Industrial Policy and Why is it Necessary?", Prepared for TSER project No PL97 1059 on Science, Technology and Broad Industrial Policy, May 1998	Narrow concept "Industrial policy is often restricted to policies about subsidies." Broad concept "(industrial policy) can be defined as any policy affecting the allocation of resources to industry and in this sense embraces both macro-economic policy ... as well as the more traditional areas of microeconomic policy."
Foreman-Peck, J., and Frederico, G., European Industrial Policy: The Twentieth-Century Experience, Oxford University Press, 1999	Industrial policy is "every form of state intervention that affects industry as a distinct part of the economy."
Beath, J., "UK Industrial Policy: Old Tunes on New Instruments?", Oxford Review of Economic Policy, Vol. 18 No.2, 2002	Narrow view: "Restrict attention to policies that target particular firms and industrial sectors." Broad view: "any policy that shapes or influences the competitiveness of a country's firms and industries"
Rodrik, D. (2004), Industrial Policy for the Twenty-First Century, CEPR Discussion Paper No. 4767, 2004	Uses the term industrial policy for "restructuring policies in favour of more dynamic activities generally, regardless of whether those are located within industry or manufacturing per se."
Aiginger, K., Sieber, S., Towards a renewed industrial policy in Europe, Background Report of the Competitiveness of European Manufacturing, WIFO	Industrial policy is the activity which creates a favourable environment for European business in general, the manufacturing sector and its industries in specific

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