

New industrial policies

Rationale and objectives

The term ‘industrial policy’ has many meanings, not all of them specific to manufacturing. However, it is helpful to distinguish two distinct meanings. The first and narrower use of the term refers to government policy that aims to alter the structure of production in ways that enhance national welfare. Such policy typically focuses on manufacturing, but not exclusively so, and has often entailed some form of targeted policy, including subsidies or protection from competition.¹ The second usage refers to horizontal policies (i.e. not sector specific) that afford an enabling environment for industry or for business more generally.

Interest in industrial and manufacturing policies has grown over the past decade. Following the recent economic crisis, many policy makers are seeking new sources of growth. Concerns about a loss of manufacturing capacities, and growing competition from emerging economies, have also contributed to a surge in interest, as has the prospect of a science and technology-driven “new industrial revolution”.

In nearly all OECD countries, for several decades, output from manufacturing has shrunk consistently, as a share of GDP and (more so) employment. This decline has been the result of: *i*) saturated local demand for manufactured goods; *ii*) high productivity growth, which requires less employment to produce a given output; *iii*) the blurring of manufacturing with services, as manufacturers increasingly capture value in the services they provide; and *iv*) the growing globalisation of industrial production through outsourcing of labour-intensive, and more recently knowledge-intensive, activities to lower-wage economies (Pilat *et al.*, 2006).

Yet manufacturing still plays a central role in OECD economies. The structural shift of OECD economies towards services has raised concerns about their capacity to maintain productivity growth, as productivity gains have typically been smaller in services than in manufacturing over the past decade. Concerns over the loss of manufacturing also raise fears that linked and often high-value added activities will be lost, including research and development and design (OECD, 2013). Other observers note that mature economies can adapt and improve their manufacturing prospects (Marsh, 2012), owing to advances in technology which affect both products and processes (e.g. nanotechnology, new materials, 3D printing and “lean manufacturing”), a greater focus on tailor-made goods aimed at specific individuals and industry users, and the introduction of sustainable forms of production.

Environmental pressure has also led governments to reconsider the merits industrial policy (Aghion, 2011). Because innovation is in certain respects path-dependent, it is often biased towards existing technologies. Governments can redirect technological change towards cleaner technologies and spur private investment in new environmentally friendly activities.

A number of countries have therefore been looking for new ways to strengthen value creation from industry and, as the financial and economic crisis of 2008-09 sometimes accentuated structural imbalances, to rebalance economies with large financial and non-tradable (e.g. real estate) sectors, adding capacities in advanced manufacturing, low-carbon and new technologies.

Industrial policy has for some time fallen into disfavour because of negative experiences which often occurred when governments tried to “pick winners” and supplant competitive markets. Governments often have limited information, compared to entrepreneurs, and may also be subject to lobbying and other practices. At the same time, there is abundant evidence that protected firms/sectors experience relatively low productivity growth. But there are also some examples of success. For instance, LG, the Korean electronics giant, might have remained a textile manufacturer, except for investment prohibitions issued by the Korean government in the 1960s, which forced investment in electric cables.

There is now a growing consensus that the risks associated with selective industrial policy must be minimised and a new approach adopted. The new approach involve facilitating and co-ordinating roles for government and new ways for government and industry to work together, while also avoiding undue influence from vested interests (Warwick, 2013). This new approach likewise aims to reconcile industrial policy and competition policy (Aghion, 2011). The evolution of industrial policy thinking is shown in Table 1.

Table 1. Evolution of theory and practice in industrial policy

Phase	Rationale and key approaches	Policy practices and instruments
1940s to late 1960s	Industrialisation is necessary for development. Market failures prevent this from happening automatically.	Industrial policy is needed, particularly infant industry protection, state ownership and state co-ordination.
1970s to 1990s	Government failure is worse than market failure. Industrial policy is an invitation to waste and rent-seeking. Practical obstacles to industrial policy are significant.	Trade liberalisation, privatisation and attraction of foreign direct investment (FDI) together with macroeconomic stability and minimum government interference are the basic requirements for growth and industrialisation.
2000s to present	Market and government failures are present. The “how” rather than the “why” of industrial policy is important. Differences in approach exist with respect to the extent to which comparative advantage needs to be defined.	Institutional setting matters but design is difficult. Flexibility in the practice of industrial policy is important. Innovation and technological upgrading should be a central objective of industrial policy. Promoting national innovation systems should also be an important objective.

Source: OECD, based on Naudé (2010a), details on representative authors/contributors to the debate on industrial policy shown in the original source.

Major aspects and instruments

New industrial policies often have the following features:

- A focus on improving framework conditions: innovation is driven by business, and for innovation to occur businesses must be operating in favourable conditions. Such conditions involve enforcement of competition rules, trade openness, the availability of skills (education and vocational training), etc. (see also the *Policy Profiles on strengthening education and skills for innovation*)
- Supporting linkages: innovation activities rely on various types of links between actors (firms, universities, individuals, intermediaries). Sometimes these linkages do not operate efficiently, motivating governments to support, among other things, research co-operation, as well as knowledge sharing between firms or between firms and universities (see the *Policy Profile on Clusters and regional policy*).
- Supporting technologies upstream: government support is provided more at the upstream stage and for generic technologies, so as not to impede downstream competition or infringe State aid rules in international treaties (WTO, EU). This upstream approach contrasts with the previous “picking winners” focus.

- Using a variety of instruments and attempting to optimise the policy mix (see the *Policy Profile on Policy mix for business R&D and innovation*). For example, in addition to a range of supply-side initiatives, some countries give public procurement a specific role in fostering innovation (see the *Policy Profile on “Stimulating demand for innovation”*). As a lead user, and major source of demand, governments can influence the diffusion of innovation. Demand-side initiatives are considered particularly effective in stimulating mission-oriented innovation by creating a market for technology in areas where it is needed to meet environmental and societal challenges (e.g. health and healthcare).
- Supporting entrepreneurship: in many technology fields new companies are essential for developing innovations, and help to maintain essential competitive pressure on established firms. But new firms often face barriers (e.g. access to finance and skills) that government can help address (see the *Policy Profiles on Start-ups and entrepreneurship* and on *Financing entrepreneurship*).
- Attracting foreign multinationals and strengthening the role of domestic companies in global value chains: governments recognise that international linkages are essential to modern industry and that technology flows are global (see the *Policy Profile on Attracting international S&T investment by firms*).

Recent policy trends

A number of OECD countries have launched industrial and manufacturing policy initiatives in recent years. For instance,

- In the Czech Republic, the *Potencial* programme began in 2014, and will run to 2020. This initiative aims to expand the capacities of manufacturers to undertake R&D and innovation as well as increase the number of businesses performing R&D. *Potencial* seeks to deepen cooperation between businesses and research organisations. The first call for project proposals was launched in 2015, with a total budget of USD 115 M PPP (CZK 1 500 M).
- The United Kingdom launched a comprehensive Industrial Strategy in 2012. It focuses on technologies, skills, access to finance, sectoral partnerships and procurement. Eleven sectors were identified and strategies developed in partnership with industry so as to build confidence and investment over the long term. Significant initiatives funded by both industry and government include the Aerospace Technology Institute with USD 2.9 billion PPP (GBP 2 billion), the Automotive Advanced Propulsion Centre with USD 1.5 billion PPP (GBP 1 billion), and the Centres for Agricultural Innovation and an Agri-Tech Catalyst with USD 232 million (GBP 160 million). In addition, the government committed USD 870 million PPP (GBP 600 million) to eight emerging technologies with potential cross-sectoral applications. With a timeframe of 2011 to 2020, the government has also created ‘Catapult Centres’, where leading businesses, scientists, clinicians and engineers work side-by-side on late-stage R&D helping to transform high-potential ideas into new products and services. The Catapult Centres conduct in-house R&D, provide access to skills and equipment which might not otherwise be within the reach of companies, help to scale up manufacturing processes and provide technology demonstrators, and assist in developing value/supply chains. Catapult Centres inform businesses about the potential of new technologies and in some cases act as a focal point for clusters of companies in particular sectors. The first seven Catapult Centres are operating in the following areas: high-value manufacturing; cell therapy; offshore renewable energy; satellite applications; digital technologies; future cities; and, transport systems. Two further Catapult Centres – in energy systems and precision medicine – have also started to operate as independent organisations. Catapult Centres are funded under a 1/3, 1/3, 1/3 model between government (core public funding), business (commercial R&D contracts won competitively) and competitively won projects (collaborative applied R&D projects funded jointly by the public and private sectors). The Catapult Centres are expected to attract total investment exceeding USD 2.3 billion (GBP 1.6 billion) during their first five years of operation.
- Beginning in 2012, Italy launched the *Fabbrica Intelligente* (Smart Factory - National Technological Cluster). The mission of the Smart Factory Cluster is to propose, develop and implement an R&D-based strategy to: i) direct the transformation of Italian manufacturing towards new products,




services, processes and technologies; ii) create a manufacturing community which is competitive in the design, implementation and exploitation of research results; and, iii) connect national and regional research policies with international policies and initiatives, with the aim of increasing the ability of Italian businesses and regions to exploit European research funds. Implementation of the strategy developed by the Smart Factory Cluster includes activities ranging from networking and sharing of research infrastructures to technological foresight.

Many countries have adopted a sector-oriented approach in their national strategy or plan for STI and, in some cases, have implemented sector-oriented initiatives combining direct funding (e.g. subsidies, equity funding) and indirect funding (e.g. tax incentives).

- In France the 34 Plans for Industrial Recovery presented in September 2013 have been reduced to 10 'industrial solutions' under the overarching programme titled New Industrial France (*Nouvelle France Industrielle* (NFI)). The NFI aims to assist all businesses to further their modernisation and transform themselves using digital technologies. The 10 industrial solutions of the NFI focus on markets with significant growth potential, which in turn would be better supplied by more modern and digitally-upgraded firms. The 10 industrial solutions are: New Resources (focusing on bio-based and recycled materials); the Sustainable City; Ecological Mobility (concentrating on environmentally friendly transport); Transport of Tomorrow; Future Medicine; the Data Economy; Intelligent Objects; Digital Security; Intelligent Food; and Industry of the Future. Most of the industrial solutions have a number of quantified goals. For instance, under 'Future Medicine', one aim is to have placed 50 000 chronically ill patients under tele-surveillance.
- Korea upgraded its 2nd S&T Basic Plan (the 577 Initiative) with the 3rd S&T Basic Plan (2013-17) with a view to promoting economic prosperity and public well-being through the High Five Strategy and identification of and support for new industries.
- The Netherlands presented its Top Sectors initiative following the 2010 general election. The new enterprise and innovation policy has introduced a sector approach across government for nine sectors: water, food, horticulture, high technology materials and systems, life sciences, chemicals, energy, logistics and creative industries. Policy focuses public resources on these sectors and fosters co-ordination in these areas by business, knowledge institutions and government. 'Top sectors' are characterised by a strong market and export position, a solid knowledge base, close collaboration between entrepreneurs and knowledge institutes, and the potential to help solve societal challenges. Dedicated funding for top-sector instruments is only some USD 128 million (EUR 106 million) a year. However, a considerable volume of public research (of which about 30% is privately financed) in universities and PRIs is being aligned with the approach, equal to about USD 1.2 billion (EUR 1 billion), excluding regional and EU funding.
- In the United States, the 2016 Budget provides USD 2.4 billion for Federal advanced manufacturing R&D, in support of a national effort to bring together industry, universities, and the Federal government to invest in emerging technologies that will create high-quality manufacturing jobs. These investments will expand R&D on innovative manufacturing processes, advanced industrial materials, and robotics. They will also complement ongoing efforts to encourage entrepreneurship and improve the transition from discovery to the market.
- Chile launched the Growth, Innovation and Productive Agenda in 2014 to promote a more diversified economy through the development of key social and economic sectors.

China and a number of emerging economies have deployed large sectoral plans in the aftermath of the global economic crisis.

- 'Made in China 2025', launched in 2015, is part of a 30-year strategy to strengthen China as a manufacturing power. 'Made in China 2025' focuses on enhancing innovation, product quality, environmental sustainability, optimizing industrial structure and developing human resources in Chinese manufacturing. 10 key sectors were identified for support, namely: ICT; numerical control tools and robotics; aerospace equipment; ocean engineering equipment and high-tech ships; railway equipment; energy efficient and new energy vehicles; power generation equipment; new materials; biological medicine and medical devices; and, agricultural machinery. The core goal of 'Made in China 2025' is upgrading through the greater use of digital technology in industry. As a



first step, 46 demonstration projects for so-called ‘intelligent manufacturing’ have been initiated by the Ministry of Industry and Information Technology. The ‘Internet Plus’ initiative, also launched in 2015, aims to digitalize major sectors of the economy. In manufacturing, the initiative has four major goals: the development of intelligent factories; customized manufacturing; synchronization over the production chain; and, the promotion of manufacturing as a service. Combined with other policies, this initiative is intended, in the words of the Chinese Premier, to bring about a ‘new industrial revolution’**Invalid source specified..**

- In 2011, India approved a national manufacturing policy for the first time, to create jobs and bolster economic growth through the next decade (Warwick, 2013). The aim was to raise the share of manufacturing to 25% of GDP by 2022. In 2014, India announced the Make in India campaign to promote itself as a global manufacturing hub. Make in India aims to ease policies, simplify regulations and improve policy predictability (e.g. tax policies). As part of the initiative, a one-stop shop and an Invest India team provide foreign investors with information on regulatory conditions and assistance for regulatory clearances.
- South Africa’s Technology Localisation Programme began in 2014 and will continue to 2017 (with a total budget of USD 92.8 million (ZAR 500 million)). The Technology Localisation Programme supports the development of local technology and innovation capabilities and the competitiveness of manufacturing in areas linked to public procurement. Examples of the forms of support provided include: access to shared technology platforms; access to high-end technical skills; design and tooling support; and, access to technical expertise.

Among other forms of support, Italy focuses on FDI to strengthen micro-enterprises and small-sized companies, combining traditional farming, craftsmanship and manufacturing with high-technology sectors. The Invest in Made in Italy Fund will invest in equity in micro-enterprises. New Zealand Trade and Enterprise also provides information on inward investment opportunities and helps link high-growth New Zealand businesses with international investors. The focus is on biotechnology, food and beverages, clean technology, infrastructure, ICTs, manufacturing and petroleum and minerals. Costa Rica has targeted FDI by multinationals using fiscal incentives for companies in strategic high-technology sectors of manufacturing.

NOTES

- 1 Credit directed at target sectors, sometimes at subsidized rates, sectorally differentiated profit taxes, subsidized electricity or other amenities, control of firm entry and exit, and selective tariffs and nontariff barriers have all been elements of industrial policy.

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