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EU industrial policy at the crossroads

Current state of affairs, challenges and way forward

IN-DEPTH ANALYSIS

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This paper seeks to serve as a key resource for policy-makers who need to understand the complex issues connected with the new industrial policy emerging in the EU. It provides an overview of the current state of affairs and of the key challenges facing the EU, followed by an analysis of the debate surrounding the main policy options going forward.

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Executive summary

Industrial policy in Europe has been developing in incremental steps, in a gradual shift from national interventions supporting specific industrial sectors to a more horizontal and common policy, aimed at improving overall framework conditions. Converging views on industrial policy and broad agreement on the main principles by the Member States led to it being formally enshrined in the 1992 Maastricht Treaty.

The economic and financial crisis that started over a decade ago led to dips in output, gross added value and employment. Industry had begun to recover at a growing pace but, since 2018, this growth has become subdued and economic conditions seem to be deteriorating. Nevertheless industry remains a crucial sector, employing one in five European workers, providing over 80 % of exports, and acting as a main source of productivity growth. Industry is also a key driver of private research and innovation, since most investment in research and development (R&D) is concentrated in the manufacturing sector.

Since the outbreak of the crisis, industrial policy has been geared increasingly towards macroeconomic goals as well as wider social and economic objectives. The EU has begun to look at industry as a means to improve the economic growth model. All this has led to the widening of the scope of industrial policy, the effect of which has been to improve coherence, coordination and clarity of focus. Recent years have witnessed the emergence of a lively debate over Europe's position in the rapidly evolving international landscape and, critically, its ability to remain a worldwide manufacturing and industrial power.

The new globally emerging paradigm for industrial policy shifts the focus when it comes to support for industrial production, from whether it should be provided or what to do, to how to accomplish it. In this context, a new more assertive, comprehensive and coordinated industrial policy at EU level will be among the top items on the agenda over the coming years. The challenge faced by this endeavour, however, is multifaceted. The policy will need to address issues ranging from increasing geopolitical and geo-economic tensions, to rapid technological transformations and digitalisation, and climate and sustainability concerns for the future.

This calls for a much broader industrial strategy, to balance alternative views and expectations regarding core elements of EU policy, including those related to the prominence placed on multilateralism, the role of diversity, openness over protection, and, critically, action to safeguard Europe's technological and economic sovereignty. This is because the multiple dynamics that have put industrial policy back on the table are both wide-ranging and often in competition with one another, therefore necessitating the careful balancing of alternative views.

Another critical element in the formulation of the new industrial strategy is the choice to shift the EU's strategic positioning from a defensive to an offensive policy stance. To address this, the new integrated approach will need to reach across a range of policy areas, including strengthening global trade rules, enhancing the EU's trade defence instruments and foreign direct investment screening, ensuring equal access and reciprocity in public procurement, and protecting critical technologies and value chains. The further deepening of the single market will also be critical, including broadening the EU's leadership in the standardisation of new technologies, and expanding support and funding to promote innovation.

The industrial policy of the future will likely require clearer strategic choices and a more flexible model able to adapt rapidly to a changing world. On the other hand, it will require greater coordination and closer cooperation among an increasing number of stakeholders.

Table of contents

Table of figures

1. Introduction

Policy action to support industry in Europe is deeply embedded in the process of European integration. Indeed, sectoral industrial measures were already implemented with the creation of the European Coal and Steel Community.[1] While the establishment of European Economic Community in 1957 did not result in the explicit launch of a common industrial policy, over the decades since then there has been a gradual shift from national action in support of specific industrial sectors to a more cross-cutting, common policy, aimed at improving overall framework conditions. The emergence of a more coherent EU-level policy can be illustrated by the Commission's focus in the 1990s on the importance of the structural adjustment of European industry in the face of global challenges, such as competition from major world economies, while supporting a business-friendly environment and market openness.[2]

Converging views on common policy and broad agreement on main shared principles by the Member States led to the formal inclusion of industrial policy in the provisions of the 1992 Maastricht Treaty, giving it a clear legal basis for the first time. As stipulated in Article 173 of the Treaty on the Functioning of the European Union (TFEU), the policy's goals are to: (1) speed up the adjustment of industry to structural changes; (2) encourage an environment favourable to initiative and to business growth throughout the Union, particularly that of small and medium-sized companies; (3) encourage an environment favourable to cooperation between undertakings; and (4) foster better exploitation of the industrial potential of innovation, research and technological development policies. In short, the main thrust of the policy is to build framework conditions favourable to industrial competitiveness.

In practice, industrial policy in the European Union is designed and implemented mostly at EU and Member State levels, with primary responsibility resting with the latter. The European Commission defines its industrial policy as 'horizontal in nature': developing advantageous framework conditions, and supporting, coordinating or supplementing Member State-level policies and action. Article 173 TFEU provides for use of the ordinary legislative procedure (co-decision), and excludes the harmonisation of national regulations or laws in this field. The horizontal nature of the policy nevertheless needs to recognise the specific needs and characteristics of individual industrial sectors. Indeed, many sector- and product-specific rules have been developed over the years.[3] In other words, industrial policy combines a horizontal basis with sectoral applications. Another distinct feature of European industrial policy is that it is cross-cutting through other policy fields, such as trade, the internal market, research and innovation, competition, the business environment, intellectual property rights, energy, employment, environmental protection and public health.

When it comes to EU funding, industrial policy is supported through all the main budgetary instruments. These include the Horizon 2020 framework programme for research and innovation, the EU's programme for small and medium-sized enterprises (COSME), the European structural and investment funds, the Connecting Europe Facility (CEF), the European Fund for Strategic Investments (EFSI), the satellite navigation systems EGNOS and Galileo, and Copernicus, the

[1] These included minimum prices, quotas and trade protection measures.

[2] See the communication on 'Industrial Policy in an Open and Competitive Environment: Guidelines for a Community Approach'.

[3] Sectors covered by industrial policy include: the chemicals, automotive, tourism, textiles and clothing, defence, fashion and creative industries, the raw materials, metals, minerals and forest-based industries, the mechanical engineering and electrical and electronic engineering industries, and the food and drink, healthcare, biotechnology, aeronautics and maritime industries.

European Earth observation and monitoring programme. This varied support touches upon many fields ranging from funding research on key enabling technologies and mobilising private investment to modernise EU industry, to innovation support for promising small and medium-sized enterprises (SMEs), support for the industrial infrastructure and measures to facilitate access to finance.[4] More recently, views have been increasingly converging on the need to leverage further private financing to support European industry. The European Fund for Strategic Investments, which has modernisation of European industry as one of its main objectives, is a pivotal example. The capital markets union, launched in 2015 is also an important step in that direction. Among other things, this initiative aims to mobilise capital and channel it to companies, including small and medium-sized enterprises, across the whole spectrum of productive activities. Central to this process is diversification of the sources of financing for European companies. Providing companies, especially smaller ones, with a broader choice of funding at a lower cost, can help stimulate investment and make the financial system more resilient, thereby promoting sustainable economic growth and job creation.

European industrial policy has been growing in importance since the beginning of the current century and, since the crisis, interest in developing it further has intensified significantly, both in the EU institutions and in the Member States (see Section 3.2). The changing geopolitical and technological landscape is exerting new pressures on industry in Europe and, according to many voices, industrial policy may need to be redefined; to what extent and in which direction however are the subjects of much heated debate.

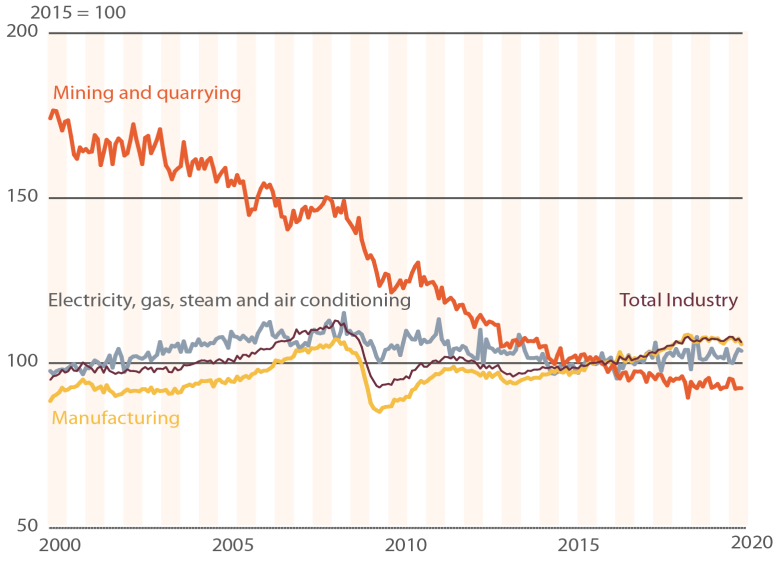
2. EU industry – facts, figures and trends

2.1. Production and value

The recent history of European industry is heavily marked by the crisis and the need to secure long-term recovery. After a period of relatively consistent growth from mid-2003 onwards, the crisis hit in May 2008, sparking a downward trend in output (see Figure 1). The pre-crisis peak of April 2008 was followed by steep decline. In April 2009 industrial output was the lowest since September 1997.

After this period recovery set in and the production volume recovered, regaining over 90 % of its pre-crisis value by May 2011. However, as the European economy started to be affected by the double dip recession, related

Figure 1 – EU industrial production for total industry and the main industrial groupings, 2000-2019



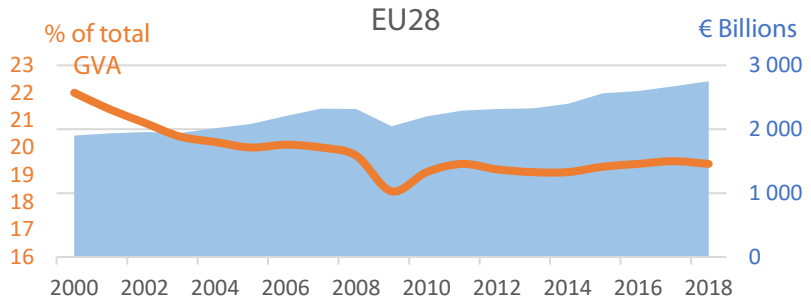
Data source: European Commission, 2019.

[4] Key enabling technologies that should boost the competitiveness of EU industry, include nanotechnologies, advanced materials, production technologies, and biotechnology.

to the sovereign debt crisis in the euro area, industrial production followed roughly the same path. There was another drop in output followed by a somehow muted recovery beginning in early 2013. The situation improved in 2015 with stronger output growth rates, a positive trend that lasted until early 2018. Since then output has been mostly decreasing or stagnating. Notably, industrial output has still not reached its 2009 pre-crisis peak. It is also worth taking a closer look at the manufacturing sector, which represented 83 % of industry's total gross value added (GVA) in 2018.[5] Taking into account just the crisis period and the recovery, the value added of manufacturing has grown by 40 % in real terms since the depth of the recession in 2009.

Nevertheless, since the beginning of 2018, confidence in the manufacturing sector seems to have been gradually deteriorating. The Purchasing Managers' Index, which summarises sentiment on the market, has generally been on a downward trend since January 2018 and in September 2019 it hit its lowest level since October 2012.[6] The main factors behind this deterioration seem to be increased global trade tensions, uncertainty around Brexit and slumping demand in the automotive sector. Data from 2017 show strong increases in the production levels of high/medium-high technology-intensive goods such as computers, and electrical and optical products as well as machinery, while the production of tobacco products shrunk by more than 15 %.

Figure 2 – Gross value added of EU industry, 2000-2018



Data source: European Commission, 2019.

In 2018, industry accounted for approximately 19.5 % of total GVA for the EU, while services accounted for nearly three quarters of value.[7] In terms of nominal value, industry has been on a mostly upward trajectory since the beginning of the millennium, with the exception of the crisis years (See Figure 2). However, in terms of share in total gross added value, there has been a gradual decline: in 2000, industry corresponded to 22 % of total GVA for the EU, dropping to 20 % by 2008, and, after a u-shaped low during the crisis, was 0.5% lower in 2018 than a decade earlier. Conversely, services have been gradually gaining in importance in terms of value creation, from 70 % in 2000, to 72 % in 2008 and 73 % in 2018.

Looking at the global trends, it is clear that some other industrially developed countries followed similar paths. In the US, industry accounted for 19 % in 2000, and declined to 15 % in 2016, while in Japan, industry's share declined from 26 % in 2000 to 24 % in 2016.[8] On the other hand, Korea, which

[5] Gross value added (GVA) is a productivity metric that provides a value (in this case in euros) for the amount of goods and services produced, less the cost of all inputs and raw materials directly attributable to that production (output minus intermediate consumption). The Commission uses GVA as an approximation of gross domestic product (GDP). The relationship between GVA and GPD is: GVA + taxes on products – subsidies on products = GDP.

[6] The Purchasing Managers' Index (PMI) indicates prevailing trends in the manufacturing sector. It summarises the views of purchasing managers on whether market is expanding, staying the same, or contracting.

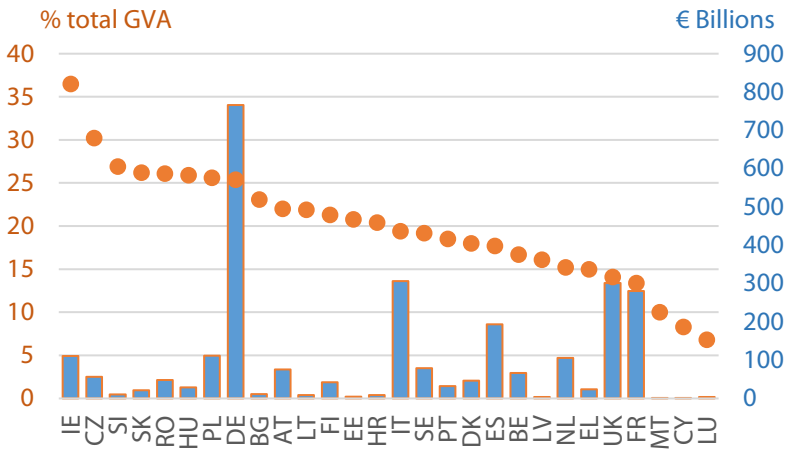
[7] In the Eurostat nomenclature and in this paper, 'industry' is understood as including manufacturing, but excluding building and construction (sectors B-E of NACE 2).

[8] The figures used are for 2016, as this is the latest data available for these two countries in AMECO.

has followed a strategic policy to build up an export-oriented, globally competitive industry for decades, shows opposite trend. Its share of industry in the total economy grew from 32 % in 2000 to nearly 34 % in 2017.[9]

It is important to remember that the performance of industry is closely related with the competitiveness of (business) services. This is because many manufactured goods contain an increasing share of service inputs: for example, logistical support, research and development, design, computer services, after sales service, advertising and marketing (see more in Sections 4.2.2 and 4.3.1).

Figure 3 – Gross value added of industry, 2018



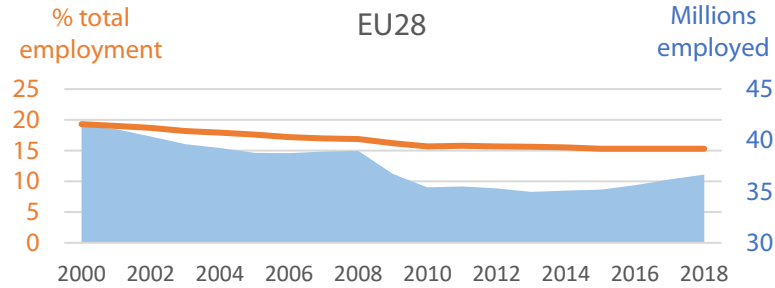
Data source: European Commission, 2019.

In absolute values, the pre-2004 Member States account for the lion's share of EU's GVA in industry (89 %), a proportion that has been the same since 2016. In 2018 the biggest industry contributions to EU GVA in absolute terms came from Germany (€765 billion), Italy (€306 billion), the United Kingdom (€302 billion) and France (280 %). Notably, the industry share of GVA generated in 2018 was below the EU average of 19.5% in many major and medium-sized EU Member States such as France, the United Kingdom, Spain, Sweden, Denmark, Spain, the Netherlands and Belgium (see Figure 3).

The significant differences at Member State level exist in terms of percentage of total GVA. Industry holds a high share in Ireland (36.5 %) and many central and eastern European countries: Czechia (30 %), Slovenia (27 %), Slovakia, Romania, Hungary and Poland (26 %).

It is also above 20 % of total gross value added in a few pre-2004 Member States: Germany (25 %), Austria (22 %) and Finland (21 %).

Figure 4 – Employment in industry, 2000-2018



Data source: European Commission, 2019.

2.2. Employment

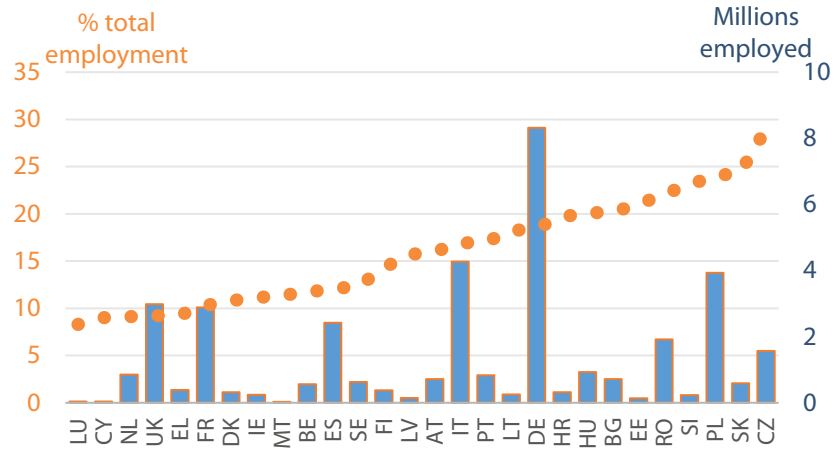
The share of people employed in industry, as a percentage of total employment, has been declining since the beginning of the millennium. In 2000 it was 19 %, in 2008 it had gone down to 17 % and

[9] For a discussion on the reasons behind the growth in the services economy see, for example, Krzysztof Falkowski 'The industrial sector in the European Union' in A.A. Ambroziak (ed.), *The New Industrial Policy of the European Union*, Springer International Publishing Switzerland, 2017, pp. 41, or F.J. Buera and J. P. Kaboski, 2012. 'The Rise of the Service Economy', *American Economic Review*, American Economic Association, 2012.

in 2018 it was at 15 % (Figure 4). In terms of numbers, 41.5 million people were employed in industry in 2000, a number that decreased to 39 million in 2008. The trend was compounded by the double crisis (the economic and financial crisis followed by the sovereign debt crisis) and took a heavy toll on employment in industry, which fell below 35 million in 2013.[10] Since then it has steadily been recovering, reaching almost 36.6 million employed in 2018. On a more positive note, between 2008 and 2018, employment in medium- and high-tech manufacturing grew from 35 % to 37 % of total employment in industry.

Looking at the global picture, the trends in developed economies vary to certain extent. Perhaps most similar to the EU is the US, where the workforce employed in industry dropped from 21.7 million in 2000 to 16.54 million in 2010, and then recovered partially to reach 18.1 million in 2016. In Japan, employment in industry has been mostly declining from 12.93 million in 2000, to 10.79 in 2016. In Korea, on the other hand, the numbers of those working in industry shrunk from 4.3 million in 2000 to 4.06 million in 2009, and then bounced back to 4.7 million in 2017. As in the case of value added discussed above, the relative decline in industry has been accompanied by growth in services. Employment in services between 2000 and 2016 increased as follows: by 29.5 million in the European Union, by 17.6 million in the United States, by 6.1 million in Japan and by 5.7 million in Korea).[11]

Figure 5 – Employment in industry, 2018



Data source: European Commission, 2019.

Looking at the individual Member States, one can observe that employment in industry in terms of share of total workforce is in general higher in the Member States that joined the EU during and after the 2004 enlargement (see Figure 5). In 2018, the countries with the highest share of people employed in industry relative to the total employment were Czechia (29 %), Slovakia (24.4 %), Poland (24 %), Slovenia (23.1 %), Romania (22.1 %), Estonia (21%) and Bulgaria (20.2%). Despite this relative importance, however, only Poland and Czechia kept their ratio of working population virtually unchanged since 2004, while it has been generally declining, to a varying extent, in the other countries that have joined the EU since 2000. Looking at the pre-2004 most populous Member States, all of them report decrease in employment in industry as share of total workforce between pre-crisis levels from 2008 and now, with Germany losing 1.1 %, and Italy as much as 2.3 %.[12]

On the other side of the spectrum, the EU Member States with the lowest proportion of people employed in industry (relative to their total employed populations) in 2018 were Luxembourg

[10] For more on the double crisis see C. Scheinert, Vicious circles. The interplay between Europe's financial and sovereign debt crises, EPRS, European Parliament, 2016.

[11] The total number of people employed in services in 2016 were 171.5 million in the EU, 122.7 million in the US, 48.5 million in Japan and 18.7 million in Korea.

[12] This concerns Germany, France, the United Kingdom, Italy and Spain.

(8.3 %), Cyprus (9 %), the Netherlands (9 %), United Kingdom (9.2 %), Greece (9.3 %), and France (10.3 %).

2.3. Trends and importance

The above data illustrate a more general pattern whereby the labour-intensive parts of the EU's manufacturing base are shifting eastwards. For example, in 2016 all nine NUTS2 regions where manufacturing accounted for upwards of 40.0 % of the non-financial business economy workforce, were in the eastern parts of the EU. According to Eurostat: 'these regions are increasingly used as manufacturing bases by enterprises from other EU Member States, in particularly neighbouring countries such as Germany or Austria, and they form an integral part of international supply chains, with a relatively highly-skilled but low-cost workforce.'[13]

Although some of the numbers observed above, relating for example to GVA and employment, may suggest a relative weakening of industry in Europe – which is not atypical for developed economies – it still remains a very important sector, employing one in five European workers. Furthermore, each additional job in manufacturing creates between 0.5 and 2 jobs in other sectors. Industry also accounts for over 80 % of Europe's exports, achieving a €365 billion surplus in the trade of manufactured products. Fundamentally, industry is also a main source of productivity growth, which is higher than in other sectors in most countries. Furthermore, it leads to increasing internationalisation of economies through trade and investment. It is also a key driver of private research and innovations, since most R&D investments are concentrated in the manufacturing sector. For example, the regions with the highest R&D intensity in the EU are often the ones with clusters based around high-technology industrial activities supplemented by knowledge-based services. They include innovative automotive manufacturers, engineering and component suppliers, and enterprises active in pharmaceuticals, environmental technology or aerospace and aeronautics. Moreover, the EU is a major producer of new knowledge in key enabling technologies (KETs), with its products based on industrial biotechnology or advanced materials having higher technology content than those of competitors from North America or East Asia. Besides, recent analysis by the IMF emphasises that, typically, manufacturing entails higher productivity gains for an economy compared with other traditional activities such as non-tradable services or agriculture. It is also important to look at the evolution of industry as a dynamic process. Over the last few decades, EU industry has been impacted by a number of megatrends that keep transforming it. These include for example deindustrialisation, outsourcing, globalisation, the emergence of new business models (such as just-in-time manufacturing), the growing role of digital technologies, advances towards Industry 4.0, and the increasing importance of sustainable production and a reduced environmental footprint.

3. Industrial policy before and after the crisis

3.1. Towards a more integrated policy

From the year 2000 onwards, both the Member States and the EU began to be increasingly involved developing industrial policy more actively, with a stronger focus on horizontal measures. Sectoral (vertical) interventions, deployed frequently in the past, started to be targeted to support and

[13] Eurostat regional guidebook 2019, p.106.

complement the more structural (horizontal) measures.[14] The main factors at play behind this included globalisation, EU enlargements, deindustrialisation (due to technological progress and to a lesser extent the offshoring of production to cheaper countries), anaemic growth rates and productivity lagging behind the US and many emerging economies.[15]

At EU level, between 2002 and 2005, in a series of communications, the Commission began developing the EU's integrated approach.[16] This was based on identifying and mobilising various policy areas relevant to industrial development, and coordinating them better so as to achieve a growing number of goals. However, it was the global financial and economic crisis of 2008 and its consequences that were fundamental in leading governments to dispense financial support to industry and increase their involvement in policy.

3.2. Industrial policy over the last 10 years

Following the outbreak of the crisis, the focus of industrial policy switched increasingly to macroeconomic goals and wider social and economic objectives (European Parliament, 2015).[17] The Europe 2020 strategy, which was aimed at overcoming the crisis and creating a better growth model in Europe, had industry at its centre. Four of its seven flagship initiatives had several focused on improving industrial competitiveness.[18] One of them, 'an industrial policy for the globalisation era', launched an integrated industrial policy strategy, which also covered competition, trade, innovation and energy. It also proposed to focus on areas such as securing access to strategic raw materials, increasing resource efficiency, developing standardisation, and strengthening the single market.

Consequently, the Union sought to reindustrialise Europe in order to 'stimulate economic growth and jobs' – notions that started to appear permanently as top priorities on the EU agenda from the start of the crisis. A series of Commission communications between 2011 and 2014 laid out the main elements of wider industrial policy, focusing notably on identifying and enabling factors improving industrial competiveness in an increasing number of other areas and policies.[19]

A few key messages can be identified as the most important. In the aftermath of the crisis, the Commission called for deep structural reform accompanied by better coordination of policies across the Member States. It also started to identify and support technologies and markets essential for the

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[14] The EPRS Economic and Budgetary Outlook 2018 explains (pp.54-55): 'Interventions that are applied differentially across sectors of the economy and essentially target the economic output of specific industries (and even firms) are referred to as 'vertical' policies. Interventions applied across the board and aimed at achieving economic objectives that affect all sectors are referred to as 'horizontal' policies. The former are structural policies, intended to alter the relative importance of industries and firms, while the latter influence the legal and institutional framework and modify technology and markets for inputs and outputs.'

[15] How to tackle challenges in a future-oriented EU industrial strategy?, Policy Department for Economic, Scientific and Quality of Life Policies, June 2019.

[16] These include: Industrial Policy in an Enlarged Europe (2002), Key Issues in Europe's Competitiveness (2003), Fostering Structural Change: an Industrial Policy for an Enlarged Europe (2004), Implementing the Community Lisbon Programme: A Policy Framework to Strengthen EU Manufacturing – Towards a More Integrated Approach for Industrial Policy (2005).

[17] EU Industrial Policy: Assessment of Recent Developments and Recommendations for Future Policies, Policy Department for Economic and Scientific Policies, March 2015. The authors also place the new Investment Plan for Europe in this context.

[18] Innovation Union, A digital agenda for Europe, New Skills for New Jobs and An integrated industrial policy for the globalisation era.

[19] These include: An Integrated Industrial Policy for the Globalisation Era (2010), Industrial Policy: Reinforcing Competitiveness (2011), A Stronger European Industry for Growth and Economic Recovery (2012), and For a European Industrial Renaissance (2014).

longer-term future of industry.[20] Consequently, the Commission reflected on the most effective ways to support industrial competiveness. These included increasing investment in research and innovation, improving market conditions, maximising the impact of a deeper single market,[21] and improving access to important inputs, such as energy, raw materials, finance and human capital and skills for industry. It also set a target for industry to contribute to 20 % of EU GDP by 2020 and started to investigate how to enable stronger integration of EU firms and of SMEs in particular, in global value chains.

With the Juncker Commission, industrial policy continued to focus on horizontal issues with an increasing focus on mobilising all policies relevant to reaching industrial goals. It sought to boost competitiveness through investment (for example through the European Fund for Strategic Investment, which supports industrial modernisation), digitalisation (for example by setting up a number of research partnerships, or growing the network of digital innovation hubs), greener industry (for example through the revised 2030 emission targets and circular economy), standardisation (bringing together relevant stakeholders to collectively develop and update European standards) and financing (making it easier for industry and SMEs to access public markets and attract venture funds).

In 2017, the Commission adopted its key document in the field, launching a renewed industrial strategy.[22] It was in line with the trend of widening the scope of industrial policy and included new initiatives on deepening the digital single market (such as free flow of data, modernisation of intellectual property rules and a cybersecurity package), trade (framework for the screening of foreign direct investment), sustainable industry (clean mobility package, strategy on plastics and stimulating sustainable finance), skills (mobilising key stakeholders to close the skills gap and providing an adequate workforce for modern industry) and improving public procurement. The strategy was noted for adding a new value chain-focused perspective, which complements more traditional support focused on individual sectors.

3.3. Assessment so far

The process of merging 'traditional' industrial policy, focused on boosting manufacturing, with an increasing number of other policy fields and goals began to gain pace at the beginning of century, and has been particularly pronounced since the beginning of the crisis. Industrial policy has also become a very important means of achieving overall post-crisis growth and modernisation in Europe. Furthermore, as emphasised in the following section, it has become an increasingly significant means of addressing the main challenges of our times, such as adaptation to technological change, sustainability and climate change, and also geostrategic concerns.

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[20] For example, in 2011 the experts developed guidelines to support key enabling technologies: micro- and nanoelectronics, advanced materials, industrial biotechnology, photonics, nanotechnology and advanced manufacturing systems, which featured prominently in the Horizon 2020 programme. In 2012 it prioritised investment in advanced manufacturing technologies for clean production, markets for key enabling technologies, bio-based product markets, sustainable industrial policy, construction and raw materials, clean vehicles and vessels and smart grids.

[21] The Commission mentioned in this respect 'developing the necessary infrastructures, offering a stable, simplified and predictable regulatory framework favourable for entrepreneurship and innovation, integrating capital markets, improving the possibilities for training and mobility for citizens and completing the internal market for services as a major contributing factor to industrial competitiveness'.

[22] Communication on Investing in a smart, innovative and sustainable industry. A renewed industrial policy strategy, (2017).

All these changes combined have pushed industrial policy up the EU agenda and underlined its relevance in identifying the most important challenges facing the European economy. On the other hand however, they have also led to the creation of a wide, umbrella-like policy with a multitude of goals. Gyorffi (2017) observes that as such there is not always a well-defined and clear idea of what purpose an EU industrial policy serves. While there are many general references to objectives such as competitiveness, growth and jobs, and sustainability, the policy does not often actively mention possible tensions or overlaps between such objectives, or how to minimise these and achieve them simultaneously.[23] Some of the objectives and effects may be seen as contradictory, for example the need to increase sustainability and reduce the ecological footprint of industry while increasing its global competitiveness, when many main EU rivals are operating in a much cheaper and more lax regulatory environment.

With the wide range of policy measures and areas mobilised by EU industrial policy its coverage is almost exhaustive. This increases the risk of policies with different underlying intervention logics having potentially conflicting objectives. While new thematic or mission-oriented priorities are emerging in the EU's industrial strategy around the themes of digitalisation and green growth, they are not accompanied by the decisive concentration of efforts and resources to achieve them. There is inadequate long-term planning, involving targets, means, instruments, and the definition of phases and intermediate milestones to realise their achievement. Also, there appears to be some neglect of territorial cohesion, and the role of regions seems to be underutilised. Nonetheless, policy measures and areas are increasingly developing with a broader underlying view (for example the value chain approach), or combining horizontal and territorial issues (such as cluster development). This demonstrates that the EU industrial strategy is more than the sum of its existing strands and indicates that a switch to more integrated and coherent approaches is possible, which could in effect break the 'silos' between policy areas and measures.[24]

4. The future of EU industrial policy

4.1. Towards a new strategic direction

Recent years have witnessed the emergence of a lively debate over Europe's position in the rapidly evolving international landscape and, critically, its ability to remain a worldwide manufacturing and industrial power. In December 2018, 18 EU Member States issued a joint statement calling for the EU to adopt a comprehensive vision for its industrial policy, in order to strengthen its strategic autonomy and rise to the challenges ahead. They were in favour of basing the new policy on long-term objectives (until 2030), with progress measured by indicators. They also called for action to identify strategic value chains and mobilise all relevant policies and tools (also financial) to support these chains via dedicated industrial programmes.[25]

On 6 February 2019, the European Commission prohibited Siemens' proposed acquisition of Alstom on the grounds that the merger would have harmed competition in markets for railway signalling systems and high-speed trains. This decision is considered to have opened a new phase in the

[23] Miklos Gyorffi, 'EU Industrial Policy', Policy Department for Economic and Scientific Policy, European Parliament, November 2017.

[24] How to tackle challenges in a future-oriented EU industrial strategy?, Policy Department for Economic, Scientific and Quality of Life Policies, European Parliament, June 2019.

[25] The non-exhaustive list mentions electric batteries, connected and autonomous vehicles, semiconductors, cyber security, supercomputers, robotics, low carbon steel-making, low carbon industrial processes, net zero energy building renovation and construction, maritime industry and space.

ongoing debate on the future of industrial policy. In its aftermath, France and Germany unveiled a joint manifesto for a European industrial policy for the 21st century. It called for a more ambitious European industrial strategy with clear objectives for 2030, pooling Europe's strengths in order to face global competition. This, according to the manifesto, would require massive investment in innovation and technology and in the development of artificial intelligence. Crucially, the manifesto calls for an examination of how EU regulatory frameworks can make the industry globally competitive, particularly rules on merger control and state aid for companies, and a possible limited right of appeal of the Council on competition policy decisions.[26] Furthermore, the manifesto calls for effective measures to protect European industrial interests, such as through tough foreign investment screening, the reciprocity mechanism for public procurement with third countries and adaptation of trade policy to defend Europe's strategic autonomy.

In May 2019, Member States called for the EU to adopt a comprehensive vision for its industrial policy, in order to strengthen its strategic autonomy and rise to the challenges ahead. They called for a forward-looking strategy with clear objectives for 2030, where industry would take lead as a key driver for growth, stressing the need for swift action to maintain the competitiveness of the European economy. The call for a new industrial policy was also clearly reflected in the conclusions of the European Council meeting of 20 June 2019, which laid out the strategic agenda for 2019-2024, as well as in the political guidelines of the President-elect of the European Commission, Ursula von der Leyen, who highlighted the need to redesign our economy and update our industrial policy.

In her letters to the various Commissioners-designate she indicated that as a matter of priority her Commission would propose a new long-term industrial strategy based on work with the Member States and businesses of all sizes. The new Commission will focus on the contribution of investment in research and innovation to supporting policy objectives and will ensure cross-fertilisation and synergies between the civil, defence and space industries. The strategy is set to cover all aspects that affect industry and its competiveness, from public procurement to trade, skills, innovation and support for SMEs.[27]

This new more assertive, comprehensive and coordinated industrial policy at EU level is therefore among the top items on the agenda of the new Parliament. The challenge posed by this endeavour, however, is multifaceted. Efforts to date have been criticised for being piecemeal in their approach. The EU has shown readiness to address new challenges in the fields of trade, foreign direct investment, and finance through a number of targeted legislative initiatives. However, a broader strategy has been called for that will balance alternative views and expectations across core elements of EU policy, including those relating to the importance of multilateralism, the role of openness over protection and the safeguarding of Europe's technological and economic sovereignty. This is because the multiple dynamics that have put industrial policy back on the table are both wide ranging and often in competition with one another, therefore necessitating the careful balancing of alternative views.

The choice to shift the EU's strategic positioning from a defensive to an offensive policy stance will also be critical in this context. An integrated approach may reach across a range of policy areas,

[26] The points of the manifesto relating to the competition policy regime have been generally criticised by the think tank community, which argues that the altering current rules is not a panacea to the weaknesses and competitiveness challenges facing European industry. On the other hand it carries significant risks to competition, innovation and effectiveness of markets.

[27] These first details of intentions for the new industrial strategy are taken from the letters from the President-elect to the Commissioners-designate for a Europe Fit for Digital Age, an Economy that works for People and for the Internal Market.

including strengthening global trade rules, enhancing EU's trade defence instruments and foreign direct investment screening, ensuring equal access and reciprocity in public procurement and protecting critical technologies and value chains. It may well also involve the further deepening of the single market, also broadening the EU's leadership in the standardisation of new technologies, and expanding support and funding to promote innovation.

The following chapter presents the main challenges that directly or indirectly condition the shape and direction of the EU's emerging industrial strategy. It reviews the ongoing debate over these challenges and discusses the related policy recommendations that have been put forward in the literature to address them.

4.2. A multifaceted challenge

4.2.1. Geopolitical challenges

A recent study prepared for the Industry, Research and Energy Committee of the European Parliament emphasises that the new emerging paradigm of industrial policy globally, means that rather than asking *whether* to support industrial production, the question is now *how* to accomplish it. Individual countries or regions are increasingly asking how they can design industrial policies that can support political objectives, and also, how their respective public sectors can implement such policies efficiently and effectively. This represents an important departure from the practice of the last three decades.

According to some authors this repositioning of the debate around industrial policy beyond the ideologies of the past to a more contextual, pragmatic understanding is rooted, in part, in the economic success and remarkable growth of China, which has made liberal use of a diverse array of interventionist industrial policies.[28] In recent years, China has taken proactive and state-driven stance to industrial and economic policies guided by the 'Made in China 2025' national strategy. These policies are aimed at developing domestic champions and helping them to become global leaders in strategic high-tech sectors (see Box).

The ambitious 10 year plan preserves China's domestic markets for its own champions and introduces selective market opening, through a mix of restrictions, licencing and technology transfer requirements, domestic laws and regulations in order to shelter domestic enterprises from competition. Cheap access to credit, imposition of local-content

Made in China 2025

Made in China 2025 is a comprehensive 10-year strategy aimed at transforming China into a global powerhouse in high-tech industries. The strategy focuses on intelligent manufacturing in 10 key industrial sectors including: (i) next-generation IT, (ii) high-end numerical control machinery and robotics; (iii) aerospace and aviation equipment; (iv) maritime engineering equipment and high-tech shipping; (v) advanced rail equipment; (vi) energy-saving and new energy vehicles; (vii) electric power equipment; (viii) agricultural machinery and equipment; (ix) new materials; and (x) biopharmaceuticals and high-performance medical devices.

In these sectors, the strategy strives to strengthen domestic innovation capacity, reduce reliance on foreign technologies and move up global value chains.

Source: China – Challenges and Prospects from an Industrial and Innovation Powerhouse, 2019.

[28] Dani Rodrik specifically argues that this most recent strand of work is rooted in two developments. One is the indisputable economic success of China and the other is dissatisfaction with the Washington Consensus-type of free-market economic policies. See D. Rodrik, Where are we in the economics of industrial policies?, VoxDev series on industrial policy, 2019.

requirements on foreign firms and emphasis on public ownership are but a few examples. China also provides for heavy subsidies for both state-owned and private sector companies, to help them enhance their traction on global markets.

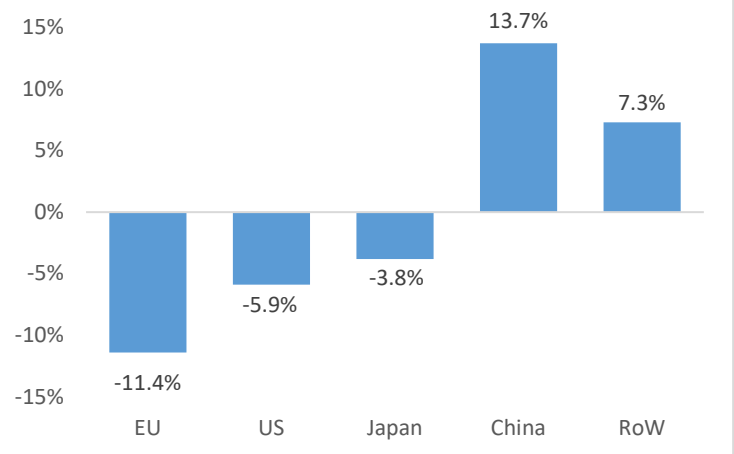
Against this backdrop, the last decade has also witnessed a rebalancing of the global economy to the east. Eased by the weak economic performance of the EU and other formerly dominant highly industrialised countries, the world's economic centre of gravity has shifted. Importantly this shift has occurred at a remarkable pace.

The size of the European economy in 2005 was €11.6 trillion whereas the Chinese economy was worth €1.8 euro trillion, at current market prices; the EU economy was six times larger than that of China. Today, the Chinese economy is worth €11.4 trillion euro, compared with €15.9 trillion for the EU 28[29]. Similarly in international trade terms, when China joined the WTO in 2001, it was the sixth largest exporter of goods in the world. By 2009, it had become the world's largest exporter, surpassing the EU as of 2014.[30].

In terms of industrial growth, between 2000 and 2014 China's share in global value added within manufacturing global value chains (GVC) grew from 6 % to 19 %. For the same period the EU's share fell from 27 % to 16 % (see Figure 6). Chinese economic prowess was driven by gains in competitiveness, especially in high-tech sectors, gradually reducing reliance on foreign-based technologies.

Within this context, research has further shown that China has defied global trends and experience by increasing the level of domestic content in its exports since its accession to the World Trade Organization. This phenomenon could be due to the way that China has shifted its comparative advantage from low value-added industries to high value-added industries, as well as to Chinese industries shifting their sourcing of intermediate inputs from foreign to domestic suppliers.

Figure 6 – Change in global shares of manufacturing value chains (in %, 2000-2014)



Source: China: Challenges and Prospects from an Industrial and Innovation Powerhouse, 2019.

The unprecedented scale and speed of growth that has characterised the Chinese economy over the last decade has also been reflected in the country's ambition to enhance its political influence and gain geopolitical leverage using its economic might. In this context, recent research also points towards China's emphasis on transport infrastructure.[31] The Belt and Road Initiative (BRI) is a clear example

[29] European Political Strategy Centre, EU Industrial Policy After Siemens-Alstom: Finding a new balance between openness and protection, March 2019.

[30] P. Mavroidis and A. Sapir, China and The World Trade Organisation: Towards a Better Fit, Bruegel Working Paper, Issue 6, June 2019.

[31] M. Damen and W. Igler, Free trade or geo-economics? Trends in world trade, Policy Department for External Relations, European Parliament, September 2019.

in this context, and one that is argued to have cemented China's place at the centre of a regional network of production processes inevitability enhancing China's overall economic and geopolitical importance. Similarly, China is also active in setting up global cyber infrastructure, for instance by being the first to roll out 5G digital infrastructure across the world, sparking security fears over espionage and dependency in other countries.

Notwithstanding the above, China is not alone in linking economic and geopolitical interests. The United States is also increasingly using the argument of national security on a wide scale in trade policy. Driven by the belief that previous US administrations have let other countries take advantage of the United States for foreign policy reasons, the current US administration is determined to end this perceived imbalance by demanding reciprocity instead. For example, in 2018 the new US import tariffs on steel and aluminium were based on Section 232 of the US Trade Expansion Act of 1962, allowing import restrictions on grounds of national security. Yet the underlying protectionist nature of the measures has been pointed out by the EU and other countries stressing that the US tariffs are not in fact based on national security considerations but are actually economic safeguard measures in disguise.

The shift in US external economic policy in recent years has also had numerous other manifestations. On one side lie the US administration's criticisms of China. The rise of China's economic power has triggered fears in the US that that it may translate into military power and thereby result in an attempt to achieve regional and/or global hegemony threatening US national security. Criticism has focused on China's mercantilist approach to trade, the active role of industrial policies and state-owned enterprises, and intellectual property theft. While, the US's critical stance towards China is not new, it has recently been taking a major toll on trade relations. The risk of a damaging trade war has come sharply into focus, as the US has applied relatively high tariffs on a considerable number of imports from China, and China has retaliated.[32]

Beyond China, the US has also taken a critical approach towards the multilateral trade system, focusing on negotiating issues bilaterally. The main target of the Trump administration's ire in this regard has been the World Trade Organization's dispute settlement mechanism and the Appellate Body, which hears appeals from reports issued by panels in disputes brought by WTO Members and can uphold, modify or reverse the legal findings and conclusions of a panel. Expressing disagreement with its operation, the US has blocked appointments of new members to the Appellate Body, which may bring the WTO dispute settlement system to a halt in December 2019. Some view US trade policy as shifting towards neo-mercantilism, a notion according to which in order to maximise wealth, a nation needs to increase its exports and reduce imports via means such as tariffs. This transactional approach to international trade may reduce economic flows and have a negative effect on EU industry, for which an open trading system is a prerequisite to maintaining and advancing its share in global markets.

The new, more isolationist, uncertain and politics-driven state of world economic affairs has already been detrimental to global economic growth and industrial production. As emphasised by the IMF and other research by the European Parliament, the new phenomenon of geo-economics has been having a damaging effect on international production networks. Rising risks, uncertainty and protectionism have all contributed to the slowdown in global value chains and the decline in fixed investment internationally. Most notably, this new state of affairs conditions the debate over the new comprehensive EU industrial strategy. A recent opinion published by Jean Pisani-Ferry and

[32] V. Gunnella and L. Quaglietti, The economic implications of rising protectionism: a euro area and global perspective, ECB Economic Bulletin, Issue 3/2019.

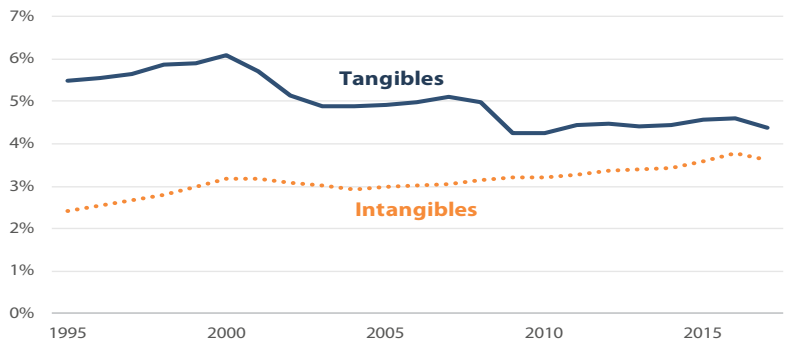
Guntram Wolff has argued that the EU needs a change of mind-set to address threats to its economic sovereignty.[33] EU and national policy systems need to adapt to improve the way they mainstream economic and geopolitical considerations and to avoid becoming hostage to the ongoing competition between China and the US. With the rise in emerging economies and frictions in the historical alliance between the US and the EU, the new multipolar world is becoming a reality. This inevitably feeds into the debate on how to preserve and expand the role of EU industry in a world whose centre of gravity of economic activity is shifting.

4.2.2. Technological challenges

The key questions in the industrial policy debate relate to what should be produced and how.[34] Today, industrial production worldwide is going through a radical transformation. New advanced manufacturing techniques are increasingly being employed, relying primarily on innovative digital technologies. Importantly, these digital technologies do not work in isolation, but are based on connected ecosystems, where objects, machines, people and the environment are increasingly closely interlinked.

This radical structural transformation of industry has, in turn, triggered the development of new economic models. Digital-based firms rely heavily on intangible assets such as intellectual property, software and algorithms. These high value adding assets are key ingredients of modern-day corporate success and are hence attracting a growing share of investments relative to tangible assets. Importantly intangibles are exceedingly mobile and minimise the need for firms or individuals to be physically present in the country where a service is provided, or to have a fixed geographical location. The digital transformation of industry therefore has forced a reconsideration of our understanding of the sources and locus of value creation in production.

Figure 7 – Tangible and intangible investment in the US and EU-euro countries (% of GDP)



Data source: OECD, EPRS analysis.
** Gross fixed capital formation in tangible and intangible assets.*

Digital technologies however are also disrupting traditional industrial value chains, expanding mobility and generating new paradigms in the context of value creation. For example, digital manufacturing uses advanced computing technologies to integrate modelling and simulation techniques into engineering, testing or design. Central in this process is the decoupling of value chains whereby research is conducted in one place, engineering in another, and manufacturing in a third, with suppliers collaborating in different processes, all in different global locations, and with all participants linked by digital technology infrastructure.

[33] J. Pisani-Ferry and G. Wolff, The Threats to the European Union's Economic Sovereignty Memo to the High Representative of the Union for Foreign Affairs and Security Policy, 2019.

[34] R. Cherif and F. Hasanov, The Return of the Policy that Shall Not Be Named: Principles of Industrial Policy, IMF Working Paper No 19/74, 2019.

In this context, traditional industries are transforming. For example, car manufacturing is undergoing an extensive transformation across its entire value chain.[35] This industry is rapidly shifting to greater reliance on battery technology as the internal combustion engine is increasingly being replaced by electric propulsion. It also faces penetration by a range of new digital services including smart electricity grids, personalised entertainment systems and smart mobility, which rest on the evolution of internet of things and artificial intelligence technologies. These developments essentially place the automobile as the central physical platform in a network of activities.

Closely linked to the above is the growing role of services in industrial production. Manufacturing firms not only buy and produce more services than before, they also sell and export more services as integrated activities. According to the OECD, today services inputs account for 37 % of the value of manufacturing exports.[36] This share rises to 53 % when considering the in-house provision of services. The incorporation of services into manufacturing takes place in a variety of ways. They can be inputs to production such as marketing, design, distribution or after-sales care embedded in the value of a good. However, services can also be enablers such as e-commerce platforms and logistics services. This process of 'servicification' suggests that upstream activities, such as R&D and product design, together with downstream activities, such as branding and advertising, are acquiring an increasing share of the value added, while activities involving the intermediate production of components and their final assembly are seeing their share shrink.

Finally, digitalisation has moved the focus of industry to the 'outcome economy', where companies compete not through the sale of products and services, but through the delivery of measurable results that are important to the customer[37]. New methods and technologies, such as connected sensors and data streams make it possible to trace, measure and analyse product usage, as well as customer behaviour. This has shifted completion and value creation for firms from the final sale of products to a continuous deeper understanding of customer needs and the contexts in which products and services will be used.

The forgoing changes are transforming and disrupting traditionally strong industries. The phenomenon is common around in the world, however, as emphasised by the European Political Strategy Centre the emerging champions in this new competition tend not to be European, but rather American and, increasingly, Chinese. While both Asia and the United States have been investing heavily in new communications technologies and related skills, the European Union has lagged behind in updating its digital infrastructure and preparing its workforce for the rapid changes[38]. This has contributed to the slower take-up of new technologies and to the continuation of business models that fail to promote the diffusion of innovation. It has also been argued that this has led to a swelling population of 'zombie firms' that trap investment and talent into low productivity activities and segments, preventing them from flowing to more productive and innovative firms.[39]

A further development of recent years has been the increasing emergence of 'superstar' firms that are pushing back the frontier of technological evolution, are typically larger, and experience high

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35 European Commission, Report of the High Level Group on the Competitiveness and Sustainable Growth of the Automotive Industry in the European Union (GEAR 2030), October 2017.

36 S. Miroudot and C. Cadestin, Services In Global Value Chains: From Inputs to Value-Creating Activities, OECD Trade Policy Papers, No 197, OECD, 2017.

37 For a more extensive discussion, see: Industrial Internet of Things: Unleashing the Potential of Connected Products and Services, World Economic Forum Report.

38 ESPAS, Global Trends to 2030: Can the EU meet the challenges ahead?, 2015.

39 European Political Strategy Centre, 10 Trends Shaping Innovation in the Digital Age, 2018.

rates of productivity growth. In many industries globally this is resulting in 'winner-takes-all' outcomes, increasing levels of concentration.

Beyond long-term productivity losses, the slow take-up of innovation and new technologies could render strategic EU industries dependent on imports of foreign technologies. This risk has already been emphasised for the EU automotive industry for example, where high dependency on battery cell imports could expose the industry to high costs and risks in its supply chain and undermine its ability to compete with foreign competitors. The notion of technological sovereignty is thereby growing in significance and has been identified by President-elect Ursula von der Leyen as a priority for the next Commission.

4.2.3. Competition and scale challenges

In the debate over Europe's future industrial policy, a discussion has recently resurfaced around the importance of scale in conditioning the success of EU firms when they compete in international markets. The specifics of this debate were already discussed in Section 4.1, but it is useful to highlight some of the underlying challenges that have been brought forward from this strand of the debate.

It has been argued that Europe's strength lies in its diversity. In 2017 there were close to 24.5 million non-financial enterprises in the EU, of which 99.8 % were SMEs, namely firms with fewer than 250 workers. Approximately nine out of ten of these consisted of micro enterprises with fewer than 10 employees.[40]

Despite their size, many of these enterprises are highly innovative, operating in niche areas often with a global footprint. However, owing to internal and external constraints many find it difficult to succeed in growing their systemic presence and scale up (grow quickly) or to gain access to international markets.[41] The economics literature confirms that start-ups that manage to scale up are key to productivity and economic growth. Scale-up companies are both young and record high growth rates. The bulk of research shows that they are significant generators of jobs, taxes and wealth and often drive innovation. Compared with countries such as Switzerland, South Korea, Japan, China or the US, the EU has proportionately fewer companies able to scale up their operations substantially. This may indicate that the barriers to growth are higher in Europe than elsewhere.

In view of the above, some authors have argued that in today's new economic environment certain sectors are bound to gravitate toward a few large players, and if Europe wants to compete in these sectors, it will need companies of a certain size. As emphasised earlier, this is the case in certain digital services, which are becoming increasingly more concentrated throughout the world.

At the same time, it should also be emphasised that scale in today's emerging economic model does not necessarily require mass. According to the OECD, this is a key characteristic of highly digitalised business models that take advantage of digital technologies to achieve strong involvement in the economic life of a country, without having any (or any significant) physical presence in it.[42] This phenomenon is also closely linked to the importance of intangible assets for the operations of digital firms, which allows businesses to achieve operational local scale without local mass.

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[40] European Commissioner Margrethe Vestager has argued that in this way, 'Europe's economy looks very much like a diverse ecosystem and any ecosystem gets its strength from its diversity.... It is stronger when its entire fate does not depend on a few species alone and when each species can react to its surroundings and evolve to get even stronger'.

[41] For a more extensive discussion see M. Szczepański, Helping European SMEs, European Parliamentary Research Service, 2017.

[42] OECD/G20 Base Erosion and Profit Shifting Project, Addressing the Tax Challenges of the Digitalisation of the Economy, 2019.

The above considerations have moved the debate around scale beyond individual companies and the selection of national champions. They have refocused the discussion on keeping EU firms globally relevant. For some, this essentially boils down to the challenge of completing the single market and Europe's inability – or political unwillingness – to bring it squarely into the realities of the 21st century digital age. It is further argued that despite its potential to offer unparalleled economies of scale in new production processes, the single market is still incomplete, particularly in services, notably those that are critical for the formation of some of the new production platforms. For example, while Europe is a major consumer of platform services, it has generated relatively few platform companies, with only 27 or 15 % of platforms globally hailing from Europe and collectively representing a little over 4 % by market value.[43]

Moreover, a number of authors have highlighted the challenge of identifying key targets on which to concentrate. Picking winners is not clear cut and there is the ever-present risk of picking 'losers'. Such a process could result in a misallocation of resources and lack of competition leading to a smaller cake to be divided between sellers and buyers. In this context, the literature has emphasised the benefits of competition in providing firms with incentives to innovate and become more productive. Research has shown that increases in competition can give a large and persistent boost to firm productivity, thus the direction of policy is to make space for the more efficient firms to grow and prosper. Pursuit of fierce competition both abroad and domestically with strict accountability is argued to lie at the core of efforts to ensure movement towards to the world's technology frontier.

The challenge therefore is not to choose between more or less competition but, carefully building competition into industrial policy, to achieve the right balance with other interventions. This effort is not limited to EU borders but extends beyond them.[44]

4.3. Responding to the challenges: possible policy areas under the new comprehensive industrial strategy

4.3.1. Foundations

In view of the multiplicity and complexity of challenges involved, the debate over the new industrial policy has expanded across a range of different policy fields from trade to investment screening, public procurement and protecting critical technologies and value chains, as well deepening the single market, balancing market power with completion policy and promoting new technologies and innovation.

Underlying this plethora of policy areas and fields, the various propositions that have been put forward in the context of the recent public debate have directly or indirectly implied a set of key principles or foundations upon which the new strategy should rest.

First, is that efforts should be **deeply rooted in European values**. Based on collaboration and common European values – as regards respect for human rights, privacy and data protection, respect for the environment and biodiversity, investment in people and smart European and global alliances – the new industrial model will help to make Europe a role model for the rest of the world.

Second, efforts should **steer clear from neo-mercantilism**. As emphasised in a recent report by the Jacques Delors Institute, the global economy is not and will never be a zero-sum game, even if its

[43] P. Evans and A. Gawer, The Rise of the Platform Enterprise, The Center for Global Enterprise, 2016.

[44] As emphasised by Commissioner Margrethe Vestager maintaining a global level playing field will be critical for EU companies is they are to have a fair chance to compete on their merits.

rules are currently under pressure. The right mix of policies should be put forward to promote openness while strengthening innovation and defence against unfair competition.

Third, efforts should be made to beef up **defensive tools**, but also to shift policies into the **offensive gear**. This implies both a more enhanced and targeted use of trade defence and investment controls and a more active use of reciprocal measures against partners that fail to open their markets along the same principles as the EU. In other words, when the EU invites people into its market, it should also be invited into theirs.

Fourth, efforts should be **bold, comprehensive and future-oriented**. It has been argued that they should resist the temptation to simply repackage old priorities and projects under the new label of industrial or growth policy. Digitalisation and effective mainstreaming of the new economic paradigm is central to this argument.[45]

Fifth, the new strategy should ensure an appropriate **balance of horizontal and vertical approaches**. Focusing simply on creating general framework conditions (a horizontal approach), as predominantly applied until today, is argued to have failed to adequately boost the EU's competitiveness and the EU at the frontier of the digital transformation. However, picking champions, whether they are firms, sectors or technologies (vertical approach), can also be ineffective and waste resources.

Sixth, efforts should result in a **truly common European industrial strategy**. As emphasised by Bruegel, the broad EU industrial policy framework should be embedded in the Member States' national reform programmes and the regions' smart specialisation programmes. Coordination of various 'Industry 4.0' programmes at national and regional level is therefore critical, and to this end leveraging the national reform programmes developed within the European Semester and the regional RIS3 smart specialisation programme could be instrumental.

4.3.2. Focus on deepening the single market

All strands of the debate over the emerging industrial policy agree that the starting point of all efforts towards a new comprehensive strategy should be the deepening of the single market. This is because despite its potential to bring together 500 million European citizens and 24 million companies, it is still far from being a genuine single market. Numerous barriers, such as gaps in legislation, administrative burdens, ineffective implementation and poor enforcement of EU law, continue to stand in the way of a truly European market in which there are no differences between operating nationally and at EU level.

Furthering market integration featured among the key priorities of the Junker Commission. It was pursued principally by means of the single market and digital single market strategies, as well as the capital markets union action plan and the energy union. It was also supported by the Council and the European Parliament, which have both called on numerous occasions for improvements in the governance and efficiency of the single market. Going forward and with view to laying the foundations for the new industrial strategy, different studies have highlighted a range of policy areas for the intensification of efforts.

A first priority area for all studies is the single market for non-digital services, including transportation, retail, financial and professional, and tourism services. As emphasised by CEPS, the competitiveness of today's European enterprises hinges heavily on a competitive single services

[45] As underlined by Commissioner Margrethe Vestager 'industrial policy that's worthy of the name has to be a digital industrial policy'.

market and on the least restrictive possible services regulation at home, minimising the negative cost spill-overs of forward linkages. A fragmented single market for services implies that intra-EU trade in services is less developed than intra-EU trade in goods. As a result intra-EU trade in services has grown more slowly when compared to services within other trade blocs, while the continuation of barriers and restrictions within the single market for services continues to restrain the ability of SMEs to scale up by expanding activities across borders within the EU.

A recent study by Copenhagen Economic stresses that many of the future sources of growth and welfare creation lie in combining services and manufacturing in new way.[46] To this end, the study highlights a number of gaps in the single market for services. The first is an adequacy gap, whereby key pieces of regulation of services trade are outdated, or could soon become outdated considering the pace of economic transformation. Digitalisation is changing economic relationships, rapidly necessitating continuous checks of the relevant regulations for fitness for purpose. The second is an implementation and enforcement gap across Member States that is leading to the continuation of national restrictive measures that prevent cross border trade in services. Better monitoring and measurement of progress and commitment to improve enforcement by Member States is therefore called for to address continued fragmentation. Last is a reality gap, whereby old dividing lines between goods and services markets are no longer applicable. In this way, unbundling the single market along such categorisations fails to address the synergies generated through servicification.

Closely related to the above is the key area of the digital single market. As emphasised by Bruegel most of the gains that could potentially be achieved under the digital single market strategy have already been achieved. The next round of problems will not be solved using the same tools. A new impetus towards increased access to digital technologies and data for business-to-business services is necessary to create a positive feedback loop for new technology platforms that make use of digital products and services. Business services are significant for European competitiveness as they are essential to manufacturing and other industrial sectors. Their important role in enhancing the value of products through new combinations of goods and services is likely to be even more pronounced in the future.

Moreover, for many authors, it is important to move beyond separate treatment of the digital single market and instead focus on securing a single market that is fit for the digital age in all respects – encompassing goods, services, capital, digital innovation and infrastructure. This could be achieved in part by broadening the digital by default principle in the design of regulation for the delivery of services, to ensure that digital services face no unnecessary barriers, and by considering more initiatives to strengthen links between the digital economy, manufacturing, artificial intelligence and data flows. At the same time users' trust in technology is also critical. On 8 October 2019, during the European Parliament hearings, Commissioner Vestager emphasised the need to engage with people's concerns about technology and build trust. To this end, new regulations on digital services would need to upgrade liability and safety rules for digital platforms, services and products. They may also need to regulate the way that companies collect and use and share data – to the benefit of the whole of society.

Beyond services and digitalisation, other studies have pointed towards the obstacles still making it difficult for small European firms and start-ups to scale up. The single market remains too fragmented for start-ups and smaller firms, which in turn find it difficult to exploit its full potential and grow to a relevant global size. Difficulties with access to finance and funding and the fragmented regulatory environment of the single market are regularly cited as important obstacles

[46] E. Rytter Sunesen and M. Hvidt Thelle, Making EU trade in services work for all, November 2018.

to growth by entrepreneurs and practitioners themselves. These barriers include cross border tax compliance issues, fragmented labour market regulations, business registration and compliance with administrative procedures, and regulation of access to data and data flow.

4.3.3. Focus on competition

The role of competition in setting the conditions for the growth of European industry has been heavily debated over the last legislature and this is likely to continue rather than subside in the context of the emerging EU industrial strategy. These two policies are interrelated and both are of crucial importance to the competitiveness of the European economy: merger and state aid control, together with antitrust enforcement, reduce distortions to the internal market (also at national level) and provide a level playing field for companies competing on merit. Industrial policy sets structural conditions conducive to competitiveness.

On one side of the debate lie increasing concerns that competition policy has grave implications for EU industry's capacity to retain its leading global position, with consequent implications for economic and, in particular, technological sovereignty. For example the Federation of German Industries has argued that 'while in China large corporations are forged by government interventions on a global scale, the competition authorities in the EU only consider the European internal market as the relevant market for European mergers... [therefore] countermeasures should be taken and the market-driven formation of European champions should be permitted'.[47] This was echoed in the Franco-German Manifesto mentioned earlier, which called for current merger guidelines to be updated to take greater account of competition at global level. Some economists argue that the EU is now in fact the only large economy where competition policy prevails over industrial policy. They give examples of a more lenient approach towards monopoly in high tech industries in the US or the pursuit of vertical industrial policies by emerging economies such as China or South Korea to promote their national champions and develop their own technological standards, in order to minimise their reliance on Western technology.

The bulk of literature however, continues to emphasise that strong competition on the domestic market is the critical factor in success on the global markets. Studies argue that it is unlikely that less competition domestically will make EU companies more able to enter foreign markets, including the Chinese market. Competition promotes the selection of the most efficient firms. It drives companies to enhance their productivity and output, reduce marginal costs and lower prices. It therefore stimulates investment and the development of new and more sophisticated services and products, facilitating innovation. On the basis of this, thinks tanks have strongly argued against the politicisation of competition policy. Bruegel in particular has underscored the importance of building on a strong and independent competition policy, 'European Commission merger control and the abuse of dominant position decisions should continue to be based on economic criteria and on independent, legally-grounded assessments'.[48]

Nevertheless, analysis by CEPS further stresses that EU competition policy is facing profound challenges in view of rapid technological and digital transformation.[49] Some internet firms are gaining increased dominance, with anti-competitive behaviour likely to become a growing problem. Potential competition from the disruptive innovation of new entrants will not necessarily

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47 BDI Policy paper, China – Partner and Systemic Competitor How Do We Deal with China's State-Controlled Economy?, January 2019.

48 M. Demertzis and G.B. Wolff (eds), Braver, greener, fairer: Memos to the EU leadership 2019-2024, Bruegel, 2019.

49 S. Blockmans, ed., What Comes After the Last Chance Commission? Policy Priorities for 2019-2024, CEPS, 2019.

be self-remedied by the markets; start ups and scale ups up must be protected actively against takeovers by more dominant companies interested in early elimination of potential competitors.

4.3.4. Focus on openness, defence and reciprocity

Importantly, the EU should have an industrial policy that goes beyond the single market strategy. It should address external challenges, geo-economic risks and increased concerns that some of our international partners are simply playing outside the rules.

The debate over possible responses to challenges in this field has remained deeply rooted in the need to safeguard openness, while remaining realistic. In other words it should ensure that openness is a two-way street understood and respected by all partners. Policy should be based on the rules-based multilateral system, recognising the benefits that globalisation has brought in terms of growth, jobs, and competitiveness. However, efforts should be stepped up so as to secure a level global playing field.

The significance of emphasising openness based on rules that are commonly agreed and upheld has been increasingly appreciated in the EU and has resulted in a repositioning of **EU policy towards China** as one that rests on a more realistic, assertive and multi-faceted approach. The 'strategic outlook' for EU-China relations, launched in March 2019, emphasised that China today is, simultaneously, in different policy areas, a cooperation partner, a negotiating partner, an economic competitor, and a systemic rival promoting alternative models of governance.[50] This requires a flexible and pragmatic whole-of-EU approach enabling a principled defence of interests and values.

Addressing the dysfunctionalities of the **multilateral trade system** is further strategic orientation. All strands of the debate over the new industrial strategy agree that modernising and updating the World Trade Organisation is critical to ensuring a level playing field. At present, multilateral rules are characterised by a number of loopholes pertaining to cross border anti-competitive practices. This means that the WTO will need to address the issue of the major role of state-owned enterprises (SOEs) in the production of goods and services and the pervasive role of production subsidies, including indirect subsidies though tax provisions and cheap across to credit for public enterprises. As emphasised by the European Commission, subsidies granted to SOEs are already covered by the Subsidies and Countervailing Measures Agreement. However, lack of clarity exists over the concept of a 'public body', which has allowed a considerable number of SOEs to escape the application of the SCM Agreement. Clarification is therefore necessary on the basis of a case by case analysis to determine whether a state-owned or a state-controlled enterprise performs a government function or furthers a government policy. Moreover, the concept of developing country status and the special and differential treatment accorded in such cases needs to be based on a needs-driven and evidence-based approach.[51]

Finally, the WTO needs to be modernised in order to improve the way it addresses trade in services and e-commerce. As emphasised by Bruegel, in the case of services, the WTO rulebook is insufficient and a more widely agreed definition of services is needed. While a number of provisions exist in the WTO rulebook, their scope of application is quite limited and there is a lack of underlying data. More critically, multilateral rules have not caught up with newly-emerging digital trade. Slow progress in this field partly derives from the very nature of data, being both a key component of e-commerce and a central element of countries' comparative advantage. As such, countries are generally hesitant

[50] European Commission, EU-China – A strategic outlook, March 2019.

[51] Within this context the EU has repositioned its strategic outlook towards China, stressing that that it cannot continue to enjoy 'developing economy' status or thereby benefit from preferential treatment.

to cooperate and share information on such data. Moreover, the blurring of boundaries between goods and services discussed earlier is increasingly likely to result in legal and regulatory uncertainties for firms involved in cross-border e-commerce under the current WTO rules, as the latter continue to rest on the traditional distinction between goods and services.

It would also be useful to consider how to deal, in the longer-term, with a possible further weakening of the WTO and the resulting paradigm shift away from the multilateral world order. Beyond simply pushing for progress on the multilateral front, a number of authors have accordingly further emphasised the need for the EU to enhance both its **defensive and offensive policy options** in order to navigate the new geo-economic environment. As regards **trade defence instruments**, whose aim is to shield European industry from the harmful effects of dumped or subsidised imports, these have recently been strengthened and made more effective. In December 2017, measures were adopted to modernise anti-dumping and anti-subsidy legislation, allowing for instance the improvement of methodologies to calculate injury, the possibility to impose higher duties based on economic reality and the launch of faster and more efficient investigations. These changes amounted to the first major revamp of the EU's trade defence instruments since the establishment of the WTO in 1994. However, as emphasised by the European Commission, these instruments do not cover all the potential effects of unfair subsidies or support by third countries and it is necessary to identify how the EU could deal appropriately with these other distortive effects.[52] A mission letter to the Commissioner Designate for Trade, Phil Hogan, tasks him with strengthening unfair trade practices as well as the trade toolbox, including upgrading the EU's Enforcement Regulation, to allow use of sanctions 'when others adopt illegal measures and simultaneously block the WTO dispute settlement process'.

Foreign investment control has also been highlighted as a further key defence mechanism. This is because foreign investment gives access to the entire internal market and therefore a common approach and procedures for the screening of foreign investments. In 2019 a new EU framework for screening foreign direct investment was adopted. The regulation was aimed neither at harmonising the formal FDI screening mechanisms used by almost half of the Member States, nor at replacing them with a single EU mechanism. Rather it was designed to enhance cooperation and information-sharing on FDI screening between the Commission and Member States, and to increase legal certainty and transparency. It has therefore been criticised for not pressing ahead in establishing an independent EU authority for investment screening. To this end, studies have suggested the need for a more centralised approach, with the Council given the right to decide by a qualified majority vote to block a foreign investment, based on a Commission recommendation. It has been proposed that a Committee on Foreign Investment in the European Union should be established, to be charged with making recommendations on the national security implications of large non-EU investments or mergers in the EU.

In the same vein and as emphasised by CEPS, to insist on reciprocity, in 2016 the Commission adopted a revised proposal for an **international procurement instrument** (IPI).[53] The aim of this

[52] This is especially the case with regard to the distortive effects of foreign state ownership and state financing of foreign companies on the EU internal market, as also emphasised in the European Commission's communication on EU-China – A strategic outlook, March 2019.

[53] The IPI is still under consideration by the legislators. The European Parliament debated the original IPI proposal both in its Committee on International Trade (INTA) and in plenary. The latter voted in January 2014 to introduce amendments, and referred the file back to INTA, giving a mandate to the rapporteur to enter into negotiations with the Council. Technically, the proposal is therefore still in first reading, where no deadlines apply. The Council, however, never managed to issue an opinion because of deep Member State divisions, including on the principle of closing EU procurement markets, which could be viewed as a protectionist measure.

proposed new instrument is to improve the conditions under which EU businesses can compete for public contracts in third countries and to give the EU more leverage when negotiating its access to foreign public procurement markets. On the basis of the proposed new legislation the Commission would be able to open investigations into alleged discrimination against EU parties in foreign public procurement markets and, if confirmed, enter into consultations with the third country concerned to obtain reciprocal concessions on its procurement market. As a last resort, price penalties on tenders originating in the third country concerned, could be applied. While these are steps in the right direction, a number of studies argued that more needs to be done on this front. For example, it has been argued that the EU's public procurement rules should do more to reflect the strategic interest in supporting EU technologies in sensitive sectors.

Following the same line of thought, a number of authors have further argued that **state-aid control** should not be limited to EU companies and that EU law should seek to ensure a level playing field for all companies. The EU should continue to monitor distortions to competition arising from support given to industry by foreign governments. Where the WTO allows for this, direct and indirect subsidies should be addressed within the multilateral system. However, if this is not possible, then a review of competition policy instruments should be considered with regard to foreign firms that benefit from state support in a way that creates an unfair competitive advantage that European companies cannot match. The new Commission will also increasingly look at ways to address the distortive effects of foreign subsidies in the internal market.

4.3.5. Focus on innovation and technology

The economic literature stresses the importance of innovation-driven growth in ensuring productivity gains. To remain competitive and sustain growth, countries need to constantly introduce new products and adopt and develop new technologies. Continuously introducing new goods and tasks enhances the seamless accumulation of knowledge and human capital and allows a country to remain on the technology frontier.[54]

Innovation and technology are therefore central to any forward looking industrial policy that wishes to steer the factors of production into sophisticated tradable industries. This is especially so in view of the key technological races that are shaping the near future globally, including those relating to big data, services, and platforms, powered through digital technologies such as AI. To achieve this, in the context of the emerging EU industrial strategy the literature has pointed towards four broad areas of action for the future, namely improving financing conditions, boosting the skills and digital capacities of the workforce, enhancing the diffusion of innovation and the abortive capacity of enterprises, and strengthening the regulatory and standardisation framework.

Boosting innovation, as well as research and development efforts, relies heavily on the availability of public and – critically – private investment. As regards public investment, according to the Jacques Delors Institute, there is a growing political consensus on the need to move towards a more active role for the state, not only in basic research but also in the area of making new technologies ready for the market. Moreover, it is becoming increasingly apparent that Member States need to converge within pan-European strategic partnerships, moving away from developing their own schemes. In this context, the European Parliament has also called for increased funding for innovation in the context of the next multiannual financial framework (MFF) 2021-2027, while others have argued for the mainstreaming of innovation policy throughout the entire MFF.

[54] R. Cherif and F. Hasanov, The Return of the Policy that Shall Not Be Named: Principles of Industrial Policy, IMF Working Paper No. 19/74, 2019.

Reliance on public financing, however, is unlikely to fully address the challenge of boosting innovation. The scale of the EU budget necessitates the development of appropriate conditions and incentives for private investment to grow. Furthermore, public sector R&D remains distant from manufacturing processes and market conditions. Studies confirm that what is needed is to channel sufficient financial resources, available via capital markets, towards large fixed and risky technology investments, in particular for start-ups and scale-ups. A lot has been achieved to this end. The European Fund for Strategic Investments (EFSI), the central pillar of the Investment Plan for Europe (Juncker Plan), was launched in 2015 and has since triggered financing for strategic projects across the continent. It has helped to reduce the investment gap according to which investment levels are estimated to be 15 % lower than pre-crisis levels. Beyond this, the capital markets union, launched in 2015, has further sought to reduce the cost of raising capital, minimise barriers to cross-border investments and provide new sources of funding for EU businesses, especially SMEs, in order to help them grow. However, it is lagging behind in adoption.

Beyond financing, the emerging industrial strategy should also address the skills gaps at EU level, especially in key sectors such as cloud computing, artificial intelligence and machine learning. In the EU context, the instruments of the new MFF, in particular the European Social Fund+, as well as increased involvement of industry in rolling out the Skills Agenda, are likely to be of fundamental importance. Analysis by CEPS argues in favour of an overhaul of existing curricula in Member States, giving more space to communication, leadership, team-working and empathy skills, together with the often-mentioned science, technology, engineering and mathematics (STEM) and coding skills. Other studies have argued for the creation of a single market for skills whereby firms can easily access skills, across borders. However, the build-up and absorption of new skills in the context of the new industrial strategy needs to ensure that Europe grows united. Analysis by the World Bank stresses that technological change, by revolutionising product and labour markets, offers ever richer opportunities for well-skilled workers and frontier firms, while low-skilled workers and less productive firms risk falling behind.[55] As a result, countries that provide fewer opportunities for people to build relevant skills and a less supportive environment for firms to thrive are losing ground.

Closely related to the above, is the ability of firms, especially SMEs, to absorb new technologies and effectively integrate digitalisation into their activities. Productivity gains do not simply grow from the development of innovation and new technologies, which can enhance or even revolutionise production processes. As emphasised by analysis by the ECB new technologies invented elsewhere need to be adapted by firms into their own production processes to make them more efficient. Therefore productivity growth depends not only on the generation of new ideas, but also on their diffusion. One way to address this challenge would be to boost the absorptive capacity of firms. The improvement of human capital and managerial ability can, as also emphasised earlier, play a critical role in this context. Moreover, investment in intangible assets, through the development of own intellectual property, software and databases has been shown to provide firms with an advantage in understanding and benefiting from new technologies.

The final area of action relates to ensuring that the regulatory framework at EU level is not only conducive to change, but can also act as a multiplier of it for European industry. A number of initiatives and policy efforts can be covered under this heading. One example is the European standardisation system. Standards facilitate the ongoing digitalisation of industry by promoting

[55] C. Ridao-Cano and C. Bodewig, Growing united: upgrading Europe's convergence machine: Overview, World Bank Group, 2018.

compatibility and interoperability between products and processes.[56] They also transfer information between economic agents or machines, while guaranteeing minimum levels of quality and safety. Crucially, standards can also become accelerators of change, by promoting innovation and the uptake of new digital technologies. The EU has long recognised this key role of standards in unlocking the growth potential of the industry. However, in new and digital technologies the development of new standards is increasingly taking place outside Europe. This trend could undermine the competitiveness of European industry in the long term. It therefore calls for a coordinated effort to develop European technology standards that are not only more responsive to policy needs but are also agile, open, more strongly linked to research and innovation, and importantly, better joined up.

Moreover, regulatory requirements condition the speed of technological advancements and related economic opportunities. For example online platforms are today among the key drivers of innovation, and data are central to their operation and growth. Regulations that protect basic civil rights, including citizens' privacy and ownership over their own data[57] can be seen as barriers to European firms' expansion into this area relative to their Chinese or US counterparts. At the same time they are critical in putting people, not technology, back in control. In the future, in its ongoing digital transformation, European industry is increasingly likely to face similar dilemmas and will need to strike an adequate balance between economic opportunities and the protection of European values.

4.3.6. Other important areas

More recently EU industrial initiatives have increasingly been favouring the development and strengthening of industrial value chains in response to emerging global challenges related to digitalisation, increased competition and growing climate and sustainability concerns. Value chains can be global[58] or regional[59] in nature and have emerged as the new paradigm for the organisation of production globally. Today, most production processes across the world are vertically fragmented as a result of the increased unbundling of tasks and functions and their sourcing from different geographical locations.[60] Notwithstanding their regional characteristics, global value chains offer increased opportunities for enterprises, by fostering their growth and internationalisation irrespective of their scale and size. Especially for smaller firms, value chains offer the opportunity to specialise in tasks within the chain in which they have expertise, and thereby become internationalised, without necessarily competing along an entire line of activities. Specialisation facilitates direct and indirect export, and gradually opens up channels for the scaling of operations, while linkage with larger firms facilitates the spill-over of technical and managerial know-how and helps to accelerate innovation down the supply chain.

Intervention in support of entire value chains, from research and universities, to intermediate suppliers, up to final producers is emerging as a new paradigm in industrial policy. As emphasised by a recent study for the European Parliament, the value chain approach differs both from traditional horizontal interventions – that have focused on the regulatory environment and trade relations – and from sectoral interventions. With the focus shifting away from specific sectors to value chains,

[56] For a more detailed analysis see I. Zachariadis, Standards and the digitalisation of EU industry – Economic implications and policy developments, EPRS, European Parliament, 2019.

[57] Such as, for example, the General Data Protection Regulation (EU) 2016/679.

[58] Some describe this as the 'Factory World' phenomenon.

[59] Clustered around Europe, Asia and the Americas.

[60] For more detailed discussion see I. Zachariadis, Global and regional value chains Opportunities for European SMEs' internationalisation and growth, EPRS, European Parliament, 2019.

this new approach contributes to a redefinition of support for industries whereby support is directed not at single companies but at entire ecosystems stretching along value chains. This opens up entirely new possibilities when it comes to comprehensively addressing industry's complex goals and needs.

Fostering industrial cross border cooperation across Europe, around strategic value chains that are key to EU industrial competitiveness and strategic autonomy, is a formidable task. The work of the Strategic Forum for Important Projects of Common European Interest can play an important role too in this regard. The forum helps bring together stakeholders from the public sector, industry and academia across Europe to identify important projects and reach a common vision at EU level for investments and effort coordination in key strategic value chains. It further facilitates agreements to push for new joint investments in those key value chains, boosting the realisation of projects that otherwise would not have taken off. Sustainability, large scale and significant potential spillovers, security and sovereignty, as well as non-linearity, are among the key criteria for identifying value chains. To this end the value chains identified for support included connected, clean and autonomous vehicles, smart health, low-carbon industry, hydrogen technologies and systems, the industrial internet of things, and cyber-security. The EU offers the possibility to apply more relaxed state aid rules in order to boost public support to these strategic value chains.

A successful example of an EU coordinated approach across an entire ecosystem is the European Battery Alliance, launched in October 2017 in cooperation with key industrial stakeholders, interested Member States and the European Investment Bank. Batteries are key for energy storage and clean mobility, and will be of strategic importance to the modernisation of EU industry. Securing technological sovereignty in this field is therefore critical. By bringing key industry players and national authorities together, the alliance aims to create a competitive manufacturing value chain in Europe, with sustainable battery cells at its core.

On 5 November 2019, the Strategic Forum provided recommendations for six selected strategic value chains where further joint and coordinated efforts are needed, in order to boost Europe's competitiveness and global leadership. These include connected, clean and autonomous vehicles; hydrogen technologies and systems; smart health; industrial internet of things; low-carbon industry; and cybersecurity.

The future of European industry will also be increasingly connected to the broader issues related to its sustainability and its role in meeting climate targets. The EU is placing a strong emphasis on decarbonisation, with the Commission proposing to dedicate 25 % of the new MFF to climate objectives. Furthermore, there are important climate and energy goals, for both 2030 and 2050, that seek to limit greenhouse emissions and strengthen energy efficiency. These, together with other major initiatives geared towards 'greening' the economy, such as on clean energy and reform of the emissions trading system, are having an increasing impact on EU industry, not least its manufacturing. Furthermore, the importance of the circular economy is growing: a system in which the value of products and materials is sustained for as long as possible, waste and resource use are kept to a minimum, and at the end of its life, a product is used to create further value. Taking the value chain approach described above could be very helpful in this context. For example, producers should be envisaging how to recycle products or materials, already at the early design or planning stage.

The conventional view of many economists and businesses is that increasing volumes of environmental legislation affect industry's competitiveness and productivity negatively, on account of the additional costs it generates. Investing in clean production methods, limiting the choice of production technologies and paying rising pollution taxes all tie up resources that cannot then be

used elsewhere. However, empirical research does not offer much supporting evidence, mostly considering these costs as transitory and without significant effects on productivity or competiveness.[61] On the other hand, pollution also has its costs, while the push towards greener industry may encourage innovation and energy efficiency, while driving down technology costs. EU's industrial competitiveness may be therefore boosted through research and innovation focused on digitalisation and the circular economy, limiting the emergence of new material dependencies. This is fundamental in a world where there is a growing realisation that resource availability is not infinite. It also creates new opportunities for industry, by driving it to use innovative, resource-efficient ways to provide customers with products.

Another incentive comes from efforts to mitigate the effects of energy costs on industry. Enterprises are vulnerable to rising fossil fuel prices, which are set on volatile markets and may depend on changes in external market forces and geopolitics. In order to mitigate this, EU policy should help with decarbonisation and industry's efforts to diminish dependence on global fossil fuel supplies. It is likely that transformational carbon-neutral solutions for energy intensive industries will be developed and will become cheaper over time with increased deployment. This will eventually lead to profound changes in European industry and manufacturing.

The new industrial policy should strive to strike a better balance between this inevitable drive towards the greening and higher sustainability of industry and the need to succeed in a fiercely competitive global economy, where many companies are under no obligation to adhere to stricter environmental rules. While perhaps the EU can carve a growing market niche and lead the way in clean production and related breakthrough technologies, the policy must not lose sight of the competitors[62], because loss of global business share is likely to have a negative impact on the financial means available for research and innovation, necessary to pursue the pro-active, sustainable and clean modernisation of industry in Europe.

5. Outlook

As shown above, industry plays a pivotal role in the EU's economy and growth model. At the same time it may well be at an important crossroads as it is increasingly affected and shaped by new disruptive forces, ranging from the rise of new technologies to changing geopolitical circumstances. Addressing these challenges brings up many important dilemmas, such as how to pursue market and trade openness while protecting industry from unfair competition, or how to promote a greener and more sustainable industry while maintaining global competitiveness.

On the other hand, it is clear that while being more than the sum of its individual parts, EU industrial policy is still predominantly 'holistic' in nature, pursuing simultaneously a multitude of goals and having an ever-widening scope. Many observers therefore argue that industrial policy should be based on the identification of clearer and better defined **priorities**, behind which the EU should throw its weight in order to achieve maximum impact. However, streamlining the policy is not likely to be easy, and is fraught with risks such as that of focusing support on sectors that might lose in

[61] For a more detailed discussion, see for example R. Harte, L. Puccio and M. Szczepański, Interactions between trade, investment and trends in EU industry, EPRS, European Parliament, 2017, pp. 67-69.

[62] A notable policy initiative in this context will be the Carbon Border Tax, proposed in the political guidelines of political guidelines of the President-elect of the European Commission, Ursula von der Leyen. The Carbon Border Tax will seek to avoid carbon leakage and ensure that companies can compete on a level playing field. Such a tax scheme is often referred to as a "border carbon adjustment" (BCA) since it makes up for the difference between the domestic carbon tax and those levied in countries with lower (or no) carbon taxes.

the future. Nonetheless in a quickly changing world, it is likely that sharper strategic choices of a transformative nature need to be made, favouring certain pathways of development. Greater risk-taking and the increased role of new experimental solutions may also be necessary. Possibly, rather than investing heavily in a few large, permanently funded projects, offering support to a large number of initially promising endeavours and then whittling the number down would be a more flexible approach and one better suited to the rising number of multiple dynamic challenges.

Bruegel recommends finding a good mix of horizontal and vertical approaches that can feed into each other. For example, successful sectoral initiatives can lead to the identification of broader, critical structural conditions previously missing. Flexible framework conditions on the other hand should allow the market, rather than political forces, to be involved in making strategic choices of the industrial areas to be supported. This should go hand in hand with deepening the single market, growing the EU-wide pool of skills, and boosting transparent competition enforcement.

In order to address future challenges successfully, the study for the European Parliament recommends a policy mix based on three elements. First, **horizontal policies** should ensure an overall structural framework conducive to competitiveness. Second, **thematic/mission-oriented priorities** can identify concrete challenges and turn them into opportunities. Recent examples here are the circular economy and key enabling technologies. This trend, which enables comprehensive support to be dedicated to reaching a specific outcome, is likely to be increasingly important in the future. The third horizontal policy would focus on the strategy's **territorial dimension**, which, while crucial for a successful industrial policy, seems to have been insufficiently supported and suffers from difficulties in combining a multitude of instruments. This policy has however the potential to boost the formation of regional clusters and bring less advanced regions into global value chains. More formalised coordination and efforts to seek synergies at regional level are needed however. Promising initiatives such as the smart specialisation strategies and platforms are still at early stages of development. Bruegel adds that to improve coordination, the structural funds could be reoriented more towards the EU's industrial policy goals.

Parliament's report argues further that successful policy initiatives need to be developed at the **junction** of these three elements for maximum impact and so that potential contradictions are reconciled on the ground. This could be possible for example with an increasing focus on the 'value chain approach', which necessitates stronger and earlier multi-level coordination and cooperation, and as such can be potentially quite effective and more coherent. However, a risk to this new approach is posed by the divergence between national and regional industrial policy strategies, which is already present, and may become even greater if Member States consider each other increasingly as competitors. Here, the role of EU in setting standards and coordinating at all levels may be fundamental in the successful exploitation of Europe's strengths, which include the size of the single market and the variety of industrial enterprises operating in it. To strengthen coherence with Member States' industrial policies, Bruegel recommends that a broader EU industrial policy should be embedded in national reform programmes. A more strategic, far-reaching view could lead to new synergies and the generation of unexpected economic possibilities, combining regional, national and European efforts to create, for example, multinational value chains to achieve goals that would be beyond the reach of an individual country acting alone.

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Industry plays a pivotal role in the EU's economy and growth model. Today, however, it stands at the crossroads, heavily affected by new disruptive forces, ranging from the rise of new technologies to shifts in global economic power and evolving geopolitical circumstances. Addressing these challenges raises a number of critical dilemmas, such as the need to pursue openness of markets and trade while protecting industry from unfair competition, or the need to promote greener and more sustainable industry while maintaining its global competitiveness. It also prompts a reconsideration of the EU's strategic positioning from a defensive to an offensive policy stance. These developments have triggered a lively debate on the need for a renewed, more assertive, comprehensive and coordinated industrial policy at EU level. This paper reviews the current state of affairs and key challenges facing the EU and provides an analysis of the main policy options going forward.

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