



Towards a New Industrial Policy for Europe

EPC ISSUE PAPER No.78

NOVEMBER 2014

By Claire Dhéret and Martina Morosi
with Andrea Frontini, Annika Hedberg and Romain Pardo

ISSN 1782-494X

EUROPE'S POLITICAL ECONOMY
PROGRAMME

The EPC's Programme on Europe's Political Economy

The Europe's Political Economy (EPE) programme monitors and analyses current economic, social and environmental issues which are topical in the EU policy debate. Our activities focus on the following long-running themes:

- *The euro crisis and its implications for economic governance and the European integration process, which will continue to dominate the European debate. The focus is on two critical issues: what does banking, fiscal and political union mean - and how can it be achieved in practice while also ensuring European action has sufficient legitimacy - and how can the economic and social crisis, which is still hitting Europe hard and leading to a downward spiral in the crisis countries, be overcome.*
- *Health and well-being - the EPC is the only Brussels-based think tank with a major focus on these topics. The EPC will continue its long-running analysis of 'Social Europe' and the sustainability of Europe's public services in the face of Europe's long term socio-economic challenges and explore how the social investment approach can be revived. The EPC's Coalition for Health, Ethics and Society (CHES) will continue to involve a wide-range of European stakeholders in topical debates on European health issues.*
- *Youth unemployment has reached unsustainable levels in a large number of EU Member States which is likely to have long-term economic, political and social consequences. The EPC's Youth Employment Task Force looks at the implementation of the measures put in place to overcome the issue, in particular the Youth Guarantee Scheme, and assess their effectiveness.*
- *Climate action and energy policy. Issues covered include: energy, climate and competitiveness (including 2020 targets, 2030 framework); EU internal market and energy solidarity; EU and External Actors and Security of Supply.*
- *Resource efficiency and creating a circular economy. Europe is in the midst of a serious economic and ecological crisis which is intertwined and reinforced by one another. In light of this, the EPC works to promote discussion on creating a sustainable economy based on smarter use of our resources.*
- *Digital technologies are truly transforming and enabling technologies, which can improve efficiency, effectiveness, productivity, competitiveness and customerisation across the economy as a whole. The EPC's Digital Single Market (DSM) project addresses what more needs to be done in Europe to develop the digital economy, complete the DSM and future-proof European digital policy.*
- *The Transatlantic Trade and Investment Partnership (TTIP) will become the world's largest free trade pact, if it is concluded successfully. The EPC's TTIP project analyses the impact of the Partnership on third countries and evaluate its chances of providing a new basis for a multilateral trade system. The project will shadow the negotiations and run until the conclusion of an agreement between the partners.*
- *Within the new Cohesion Policy 2014-2020, the design and implementation of Research and Innovation Strategies for Smart Specialisation (RIS3) have become a precondition for receiving EU structural funds. Information and Communication Technology (ICT) plays a critical role within the RIS3. The EPC's Smart Regions project analyses the role of ICT within smart specialisation and its impact on regional economic growth and productivity.*
- *Industrial renaissance is high on the political agenda and the importance of manufacturing in our economy has gained increased attention. The EPC's Industrial Policy Task Force aims to identify a strategic vision for the future of industrial policy in Europe and to develop policy recommendations to strengthen industry's competitiveness.*

Table of Contents

Acknowledgements..... iv
Executive Summary..... v

1. Introduction..... 1
2. The unequal deindustrialisation process across Europe – Why is it worrying?..... 3
3. Towards a new strategic vision for industrial policy in Europe..... 12
4. A toolkit for implementing the vision..... 18
5. Conclusions 64

Bibliography..... 66
Annexes 74

About the authors

Claire Dhéret, EPC Senior Policy Analyst, and **Martina Morosi**, EPC Programme Assistant, are the main authors of this publication. They received contributions from **Annika Hedberg**, EPC Senior Policy Analyst, on ‘Completing the internal energy market’. **Annika Hedberg** together with **Romain Pardo**, EPC Junior Policy Analyst, co-wrote the section on ‘Becoming a leader in new business models’. Lastly, **Andrea Frontini**, EPC Junior Policy Analyst, wrote the section on ‘Strengthening the external dimension of European growth for a better impact on European industry’.

Acknowledgements

This Issue Paper is the final outcome of the EPC Task Force, which has been running for more than a year. It has benefited from great input from EPC members, who participated in our different Task Force meetings. The EPC thanks them for their active participation. In particular, Gokalp Gumusdere, European Policy Advisor at CECIMO, provided a large contribution to the paper's section on industrial eco-systems. In addition, we would like to address a very special thanks to Gabriel Crean, Director for Europe at CEA Tech, who kindly chaired our Task Force, helped steer the project, and provided very helpful comments on this paper. Last but not least, we would like to thank Fabian Zuleeg, EPC Chief Executive and Aziz Zenasni, European Affairs Manager at CEA Tech, for their insightful feedback.

Executive Summary

Recent policy debates have confirmed that manufacturing forms a key pillar of the industrial sector and of our economy. However, European manufacturing has been in steady decline for decades. This trend, accelerated by the economic and financial crisis, is certainly part of an overall shift towards the service economy and is also affecting other developed economies, such as the US. But more importantly, it also highlights the structural deficiencies of the European manufacturing industry. In particular, it points out its difficulty in renewal and adaptation to the new global environment and therefore the trouble in maintaining a strong industrial base and a competitive position at the international level. At the same time the economic and financial crisis has shed light on the risks of an excessive reliance on the service and financial sector and the necessity to look for new sources of growth. As a response, this paper argues that fostering a more innovative, knowledge-intensive, new technology-oriented and resource-efficient manufacturing industry in Europe is the right way to go.

In the current context, an ambitious rhetoric has been adopted both at the European and national level with the aim of demonstrating the determination of public authorities to address the issue. Along with the rhetoric, they also launched sweeping action plans to revive the industrial base and reverse off-shoring trends. However, concrete measures undertaken at both governance levels have been inconsistent and weak compared to the magnitude of the challenges faced by European manufacturing as well as the policies implemented by our main competitors.

The relevance and the scope of the issue necessitates a decisive move away from past and current industrial policy thinking and practices, which have shown their limitations. A shift towards a coordinated approach at all levels, i.e. between Member States, across industry, between public and private entities, across all governance levels and the different Directorates-General of the European Commission, is required. This coordination approach should rely on clear objectives, a well-defined strategy and a mandate for the EU to act in the field of industrial policy.

This EPC Issue Paper, which represents the final outcome of the EPC Task Force on 'A New Industrial Policy for Europe', provides suggestions to steer the EU in this direction. It contributes to the on-going policy debate on industrial policy and identifies a framework for future actions.

Following the introduction, chapter 2 provides empirical evidence on the deindustrialisation process occurring across Europe and its detrimental effects on the overall economy. Furthermore, it highlights significant divergences in manufacturing performance between Member States which is likely to raise additional challenges for the EU, such as the failure of further economic integration.

Chapter 3 reviews the evolution of the industrial policy thinking over time and the role played by public authorities. Taking a step back in time shows the limitations of past strategies. Therefore, the authors of this paper call for a new and more ambitious strategy articulated around the operationalisation of European cooperation. This cooperation should be based on two guiding principles, i.e. a more collaborative approach between relevant stakeholders and the optimisation of EU strengths.

Lastly, chapter 4 presents a toolkit for the implementation of the new strategic vision and develops a series of policy recommendations. The implementation should be unveiled in a three-stage process. First, specific requirements, i.e. better and smart regulation, investment in human capital, optimisation of the role of public authorities, and easier access to finance, need to be put in place across the whole EU's territory in order to prepare the ground for the strategic vision to deploy successfully. Second, the two guiding principles of the operationalisation of European cooperation, i.e. a collaborative approach (1) and the optimisation of EU strengths (2) need to materialise. They include building up a complete industrial eco-system, implementing the smart specialisation concept, facilitating the emergence of a European value chain, completing the internal energy market and strengthening the external dimension of European growth through actions in trade and economic diplomacy. Finally, enhancing sophistication factors, in particular innovation and the development of new business models, is needed to complete the strategy.

Following this action plan will provide the EU and its Member States with the right tools to strengthen its comparative advantage in global competition. This will therefore secure a better future for manufacturing in Europe.

INTRODUCTION

What role does the manufacturing industry play in our economy? What are the policy levers to help European industries improve their strategic position in global competition? These two questions have certainly been at the heart of policy debates for several decades but they have resurfaced at the top of the policy agenda in the aftermath of the economic and financial crisis of 2008-2009. Several reasons explain this resurgence of interest. On the one hand, the crisis brought out European industry's vulnerability into the open and accelerated on-going trends, including the intensity of global competition and the inadequacy of several policies decided both at the European and national level. On the other hand, the crisis shed light on some major economic imbalances. In particular, it highlighted the risks associated with a high reliance on the financial and service sectors, the steady decline of manufacturing industry in our economy as well as the urgent need to look for new sources of growth.

Such developments pushed scholars and policy-makers to re-consider the role of manufacturing industry in our advanced economies. More importantly, they started to see it again as a pre-condition for growth. Thus, the decline of manufacturing production in Europe has now been widely recognised as a matter of concern. Deindustrialisation is no longer perceived as a natural process of economic development. In addition, the mere focus on the service sector that was, until recently, seen as the way to go in many EU countries, has appeared as not being a sustainable choice in the long-term. Along this line, changes in rhetoric have spread all over Europe.

In this context, many national governments have launched ambitious communication strategies and unveiled sweeping action plans to revive the flagging industrial base and to attract new manufacturing activities. At the European level, the issue also gathered momentum with the publication of several communications in which the European Commission repeatedly affirmed the importance of a strong industrial base. For instance, the Commission highlighted in the 2010 Communication on an *'Integrated Industrial Policy for the Globalisation Era'*¹ the key role of manufacturing in underpinning the recovery of growth and jobs and addressing societal challenges such as climate change and ageing population. A list of priority actions was set, including horizontal measures in the different areas affecting European industry's competitiveness. The importance of a coordinated approach in EU policies, as well as the need for increased cooperation between Member States, was stressed. In its 2012 Communication entitled *'A stronger European Industry for Growth and Economic Recovery'*², the Commission called for a partnership between the EU, its Member States and industry and decided to complement its horizontal approach with a more vertical one, giving emphasis on specific technologies. It announced intentions to focus investment and innovation on six priority action lines: advanced manufacturing technologies for clean production, key enabling technologies, bio-based products, sustainable industrial policy, construction and raw materials, clean vehicles and vessels, and smart grids. Finally, the

¹ European Commission (2014), "An Integrated Industrial Policy for the Globalisation Era - Putting Competitiveness and Sustainability at Centre Stage", COM (2014) 614.

² European Commission (2012), "A Stronger European Industry for Growth and Economic Recovery", COM (2012)582 final.

Commission reiterated its message in its 2014 Communication *'For a European Industrial Renaissance'*³, which called Member States to mainstream industrial competitiveness in all policy areas and to raise the contribution of industry to GDP to as much as 20% by 2020⁴.

All this shows that the policy ambition is clear. However, the reality is different. Many inconsistencies arise across Europe and EU industrial policy is still far from being a fully-fledged and integrated strategy. The new global environment, be it increased global competition with traditional and new competitors, growing global demand for resources and high volatility of commodity prices, changing consumption patterns, and the spread of technological innovations for manufacturing, will require structural changes and new strategic choices by the manufacturing industry. Europe will have to deal with these challenges in a coherent manner and to concentrate its efforts on actions, which can reinforce its competitiveness in the long-run. Concerns have also been recently raised with regard to whether the EU concentrates on the right objective. The 20% target is a case in point. Indeed, policy advocates have questioned whether the content of manufacturing production is not more relevant than its exact volume. They have therefore asked for more clarity in the direction taken by the EU in industrial matters.

This paper joins the appeal and aims to contribute to the current policy debate, by addressing the key questions raised in this introduction. As the final output of the European Policy Centre's (EPC) Task Force entitled *'A New Industrial Policy for Europe'*, it provides empirical evidence on the role and state of the manufacturing industry for future policy-making. Based on the discussions held in the different Task Force meetings⁵, its main objective is to present a strategic vision for industrial policy in Europe by providing policy recommendations for its realisation.

To do so, this paper gives a particular emphasis on manufacturing industry⁶, while also acknowledging the broader scope of industry and the need for developing a strategy covering the entire sector. This paper also recognises the cross-cutting nature of the topic and the significant role of all relevant stakeholders in reinvigorating our industrial base. However and due to the limited scope of the paper and of the Task Force's time span, the focus will be put on actions, which are most urgently needed.

Starting with a description of the large European deindustrialisation process across Europe, which is put into perspective by depicting global trends, the second chapter highlights the main concerns for Europe's future competitiveness. The third chapter presents the guiding principles of a new strategic vision for EU industrial policy and indicates major points of differentiation with past approaches. Lastly, the fourth chapter offers a toolkit for implementing the vision, based on a three-stage process and develops a series of policy recommendations.

³ European Commission (2014), "For a European industrial renaissance", COM (2014)14/2.

⁴ Today's manufacturing contribution to GDP accounts for about 15%. It is worth noting that other countries do also have similar targets. In China, the GDP share of the industries considered as strategic is targeted to rise by 15 percentage points by 2020. In India, the share of manufacturing value added in GDP is targeted to raise from 16% to 25% by 2022. See Manyika J., Sinclair J., Dobbs R. et al. (2012), "Manufacturing the future: the next era of global growth and Innovation", McKinsey Global Institute.

⁵ The discussions held at the Task Force meetings certainly represented a good basis for this paper. That said, the depth of the policy recommendations goes far beyond these discussions and have been developed by the EPC itself. Therefore, this paper represents the sole responsibility of its authors and in no case the one of the Task Force members. The list of the Task Force meetings is available in Annex 1.

⁶ In line with the classification used by Eurostat, manufacturing includes all activities of the section C of the NACE (Statistical classification of economic activities in the European Community) rev 2. This section covers all activities involving the physical or chemical transformation of materials, substances or components into new products. See NACE website, available at: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Manufacturing_statistics_-_NACE_Rev._2, last accessed on: 3 November 2014.

THE UNEQUAL DEINDUSTRIALISATION PROCESS ACROSS EUROPE – WHY IS IT WORRYING?

2.1	The gradual deindustrialisation process in Europe	3
2.2	Manufacturing matters!	6
2.3	Increased divergences of manufacturing performance across the EU	7

Facts and figures leave no room for ambiguity: manufacturing is facing major challenges in Europe and the sector is losing ground in our economies. This chapter shows, through empirical evidence, the gradual decline of manufacturing and puts it into perspective by comparing EU manufacturing trends with the ones occurring in other economies. Current developments raise major concerns for future Europe's competitiveness. In addition, it is shown that there are significant divergences which exist between Member States with regard to the performance of the manufacturing sector and its weight in the economy. Such divergences clearly highlight the important role that public policies play in providing the manufacturing industry with the right tools for its development.

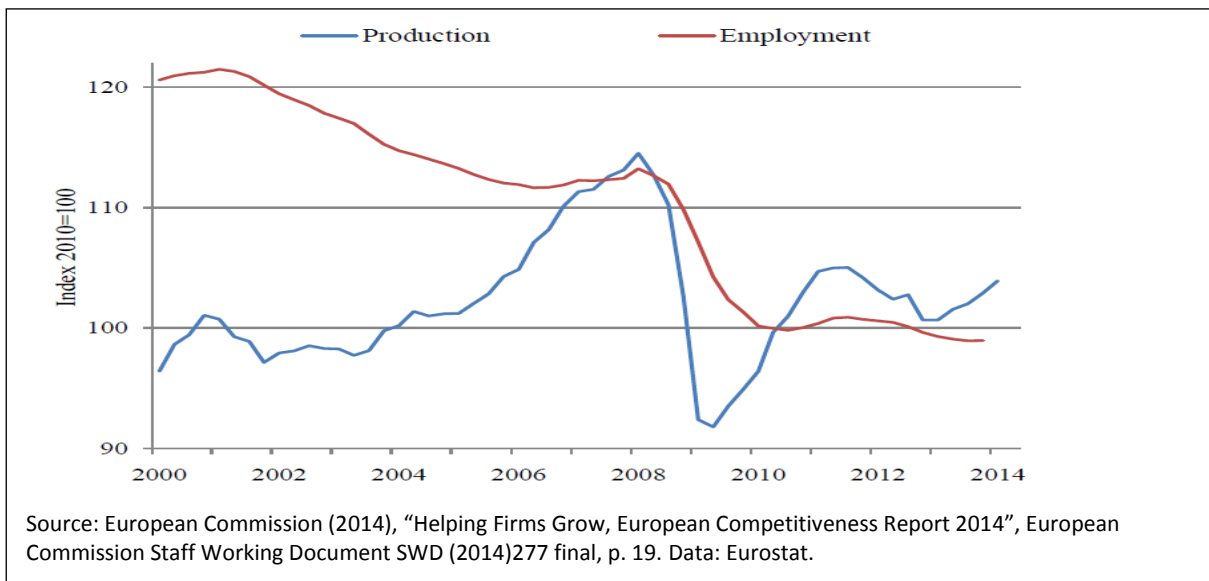
2.1 THE GRADUAL DEINDUSTRIALISATION PROCESS IN EUROPE

The decline of manufacturing in Europe is nothing new and all studies providing evidence on this issue convey the same message: Europe has entered a process of deindustrialisation for several decades, which has strongly accelerated some years ago as a result of the financial and economic crisis. Manufacturing in Europe has been facing serious difficulties for a long time, which are illustrated by the constant reduction of the manufacturing share in almost all indicators.

Figure 1 displays the tremendous effect that the crisis has had on manufacturing production and the slow recovery occurring since then. This shows that employment in the manufacturing sectors has fallen sharply and continues to do so. Three and half million jobs⁷ have been lost in Europe's manufacturing since 2008.

⁷ European Commission (2014), "Progress in industrial competitiveness per EU country", Memo 14/526, September.

Figure 1: Production and employment in EU manufacturing 2000-2014



Downwards trends even go beyond production and employment. The share of manufacturing in GDP has fallen from 15.8% before the crisis to 15.1% in 2013⁸. While such trends reflect, to some extent, a structural shift to the service sector and the changing nature of manufacturing which is becoming increasingly knowledge-intensive and therefore less conducive to job creation, they also reveal profound weaknesses in European manufacturing. Furthermore, its strategic competitive position in the global economy is increasingly challenged by other economies, mainly the US and Asian countries.

Such challenges are also well illustrated by figures. Figure 2 indicates that the EU share of world manufacturing production value has steadily declined since the start of the economic crisis, while it has been booming in China from 2006 onwards. A decline can also be observed in the US between 2006 and 2009. But it has since stabilised and US manufacturing now seems to have entered onto a path of recovery. When looking at Figure 3 and the distribution of the world manufacturing added value, the situation seems to be far less dramatic for Europe. Europe is still generating around 28% of world manufacturing added value and is well above the US and China. This is an important aspect to take into consideration when assessing the position of EU manufacturing in global economy. Yet, trends are often more telling than absolute figures. The EU's share has been sharply decreasing since 2008, while the opposite trend is occurring in China. Looking at the ranking of individual countries in the global manufacturing gross value added (see Figure 4) confirms the evidence of a loss of European countries' competitiveness. On the contrary, emerging economies such as Brazil, India and China, which have traditionally played a secondary role in the global value chain, have now begun to catch up and are getting top positions in the ranking. All this shows that these countries have now entered the world of complex and innovative value chains, which were previously considered the preserve of developed economies.

⁸ European Commission (2013), "European competitiveness report 2013, Towards knowledge-driven reindustrialisation", European Commission Staff Working Document SWD (2013)347 final.

Figure 2: EU, Chinese and US shares of world manufacturing production value, 2004-2012

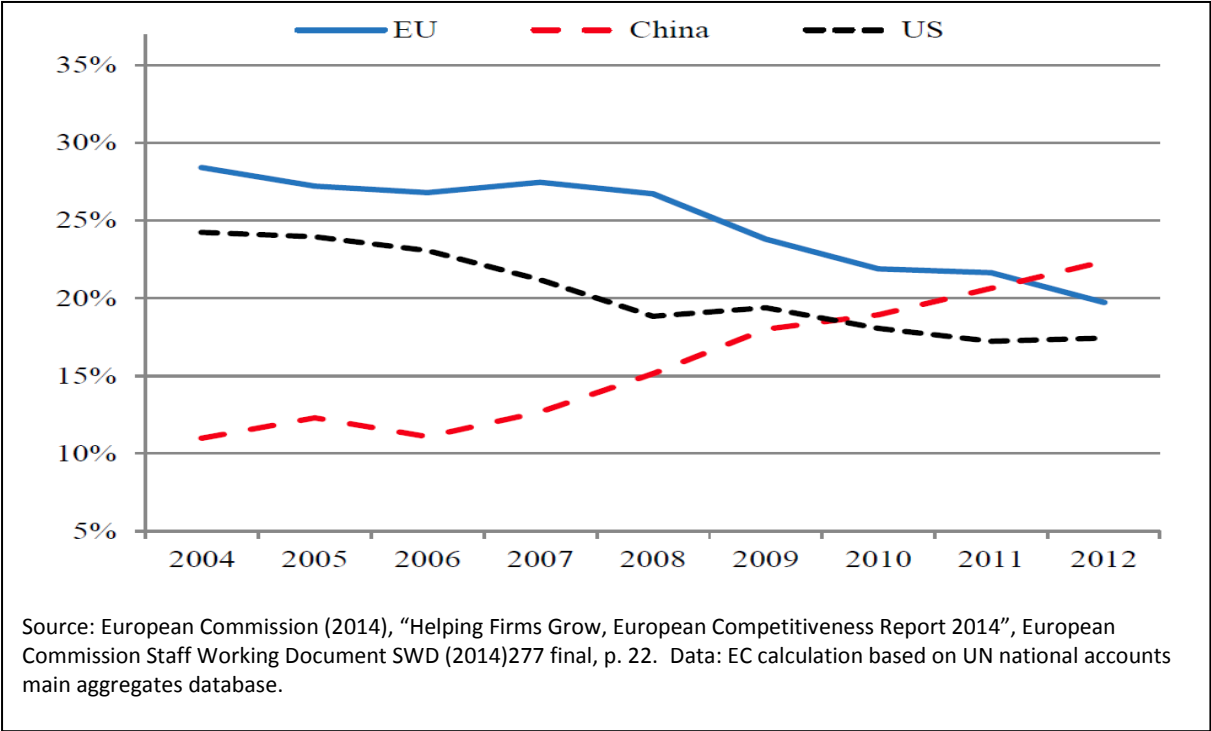


Figure 3: EU, Chinese and US shares of world manufacturing value added, 2004-2011

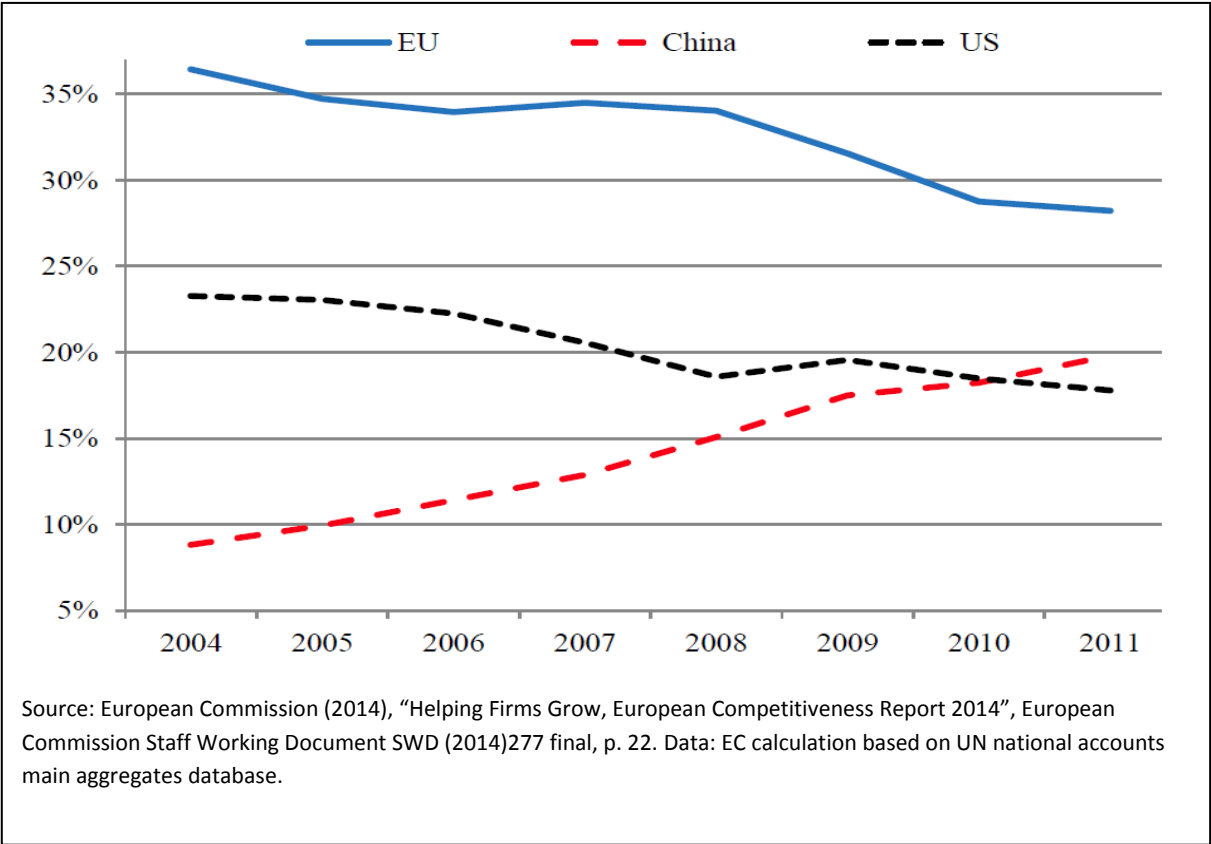


Figure 4: Top manufacturers by share of global nominal manufacturing gross value added

Rank	1980	1990	2000	2010
1	United States	United States	United States	United States
2	Germany	Japan	Japan	China
3	Japan	Germany	Germany	Japan
4	United Kingdom	Italy	China	Germany
5	France	United Kingdom	United Kingdom	Italy
6	Italy	France	Italy	Brazil
7	China	China	France	South Korea
8	Brazil	Brazil	South Korea	France
9	Spain	Spain	Canada	United Kingdom
10	Canada	Canada	Mexico	India
11	Mexico	South Korea ¹	Spain	Russia ²
12	Australia	Mexico	Brazil	Mexico
13	Netherlands	Turkey	Taiwan	Indonesia ²
14	Argentina	India	India	Spain
15	India	Taiwan	Turkey	Canada

Source: Manyika J., Sinclair J., Dobbs R. et al. (2012), “Manufacturing the future: the next era of global growth and Innovation”, McKinsey Global Institute. Data: Based on HIS Global Insight database sample of 75 economies, of which 28 are developed and 47 are developing; manufacturing here is calculated top down from the HIS Global insight aggregate; there might be discrepancy with bottom-up calculations elsewhere. Note: (1) South Korea ranked 25 in 1980. (2) In 2000 Indonesia ranked 20 and Russia 21.

The next section will show why a loss in manufacturing competitiveness is a matter of concern. It will also provide evidence on manufacturing’s positive externalities on the whole economy.

2.2 MANUFACTURING MATTERS!

Strong evidence has shown that manufacturing is essential and creates strategic links with other parts of the economy. In the 2013 Competitiveness report, the Commission indicates that an “additional final demand in manufacturing generates around half as much additional final demand elsewhere in the economy”. In addition, manufacturing represents the major source of investment in research and development (R&D) (62.3% in 2011)⁹, a key source of exports (80% of total EU exports)¹⁰ and a main driver for employment in other sectors, including services. In this respect, economists have demonstrated that each additional job in manufacturing creates between 0.5 to 2 jobs in other sectors. In other words, ceding capacities in manufacturing can have very detrimental effects on the economy as a whole. It might indeed result in the loss of R&D, exports, design capabilities, and innovation in the longer-term¹¹.

The increased linkage between manufacturing production and manufacturing-related services also needs to be seriously taken into consideration. Manufacturing firms are no longer limited to production activities. They increasingly develop pre- and after sales services and provide customised

⁹ Eurostat data. This figure relates to the share of business enterprise sector’s expenditure in total EU R&D expenditure.
¹⁰ Eurostat data.
¹¹ Warwick, K. (2013), “Beyond Industrial Policy – Emerging issues and trends”, OECD Science, Technology and Industry Policy Papers, Paris.

solutions to customers. Today, the share of service-related jobs in manufacturing employment represents around 40%¹². Experts are therefore talking about the ‘servitisation’ of manufacturing and the service content in manufacturing final output has significantly increased over the last decades. Furthermore, this is not only the quality of the product, which determines a firm’s market share but also the quality of the service (or solutions) attached to it.

In light of this, there is no doubt that production activities and services are complementing each other, or even, depending on each other. This is something that needs to be seriously taken into account when designing policies as the development of high-quality support services can play a pivotal role in maintaining manufacturing production and employment in Europe. Indeed, many services are closely linked to manufacturing production and located where the local demand is. In other words, building new and innovative capabilities in services could reduce off-shoring trends.

Notwithstanding the wide deindustrialisation process occurring across Europe, it is worth noting that the trend is uneven between Member States. There is indeed disquieting divergences in the weight and performance of manufacturing across Europe.

2.3 INCREASED DIVERGENCES OF MANUFACTURING PERFORMANCE ACROSS THE EU

The EU’s industrial base has always been characterised by significant differences in industries’ structure and their capacity to grow. Such differences are both perceivable at the firm level, depending on their size and innovation capabilities but also across the EU’s territory. Divergences between countries have even increased over the last years, not least due to the effect of the crisis. Figures 5 and 6 provide evidence in this respect. While Figure 5 shows the wide discrepancies of national share in EU manufacturing by Member State, Figure 6 indicates that manufacturing recovery has been very uneven across the EU.

¹² Data based on the EU Labour Force Survey. See, Veugelers R. (2013), “Manufacturing Europe’s growth”, Volume XIII, *Bruegel blueprint series*, Bruegel, Brussels, p. 28.

Figure 5: Share in EU manufacturing by Member State (% of total)

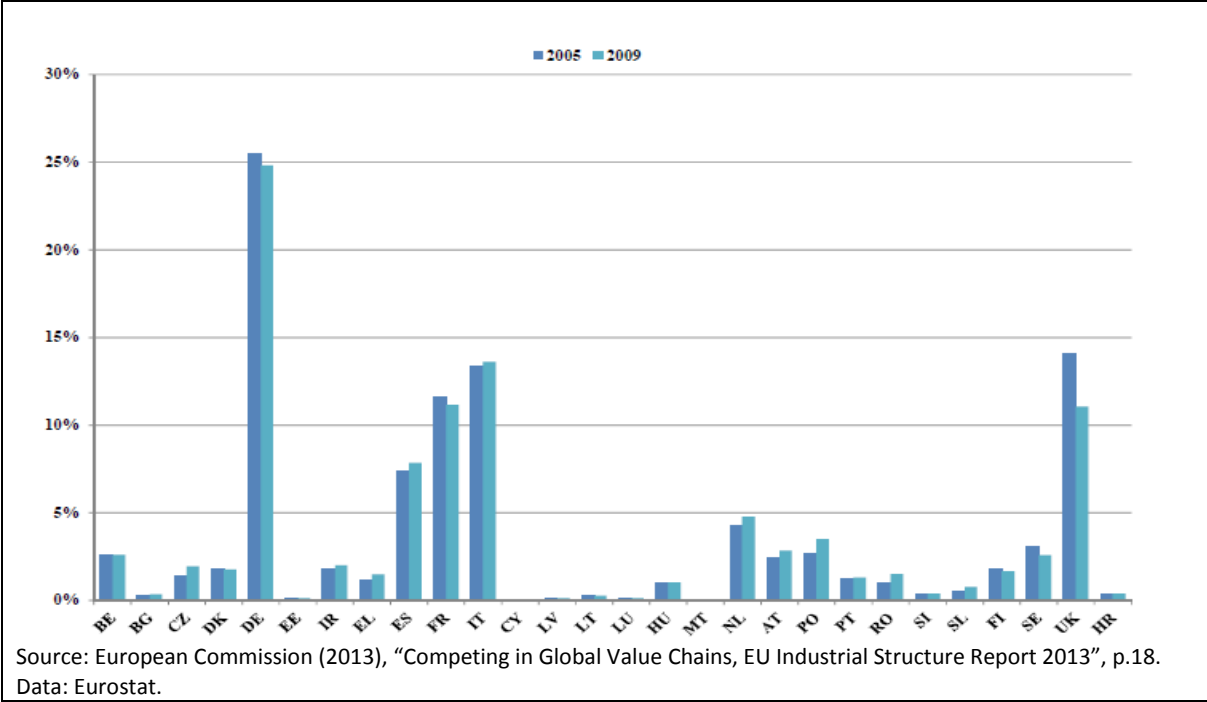
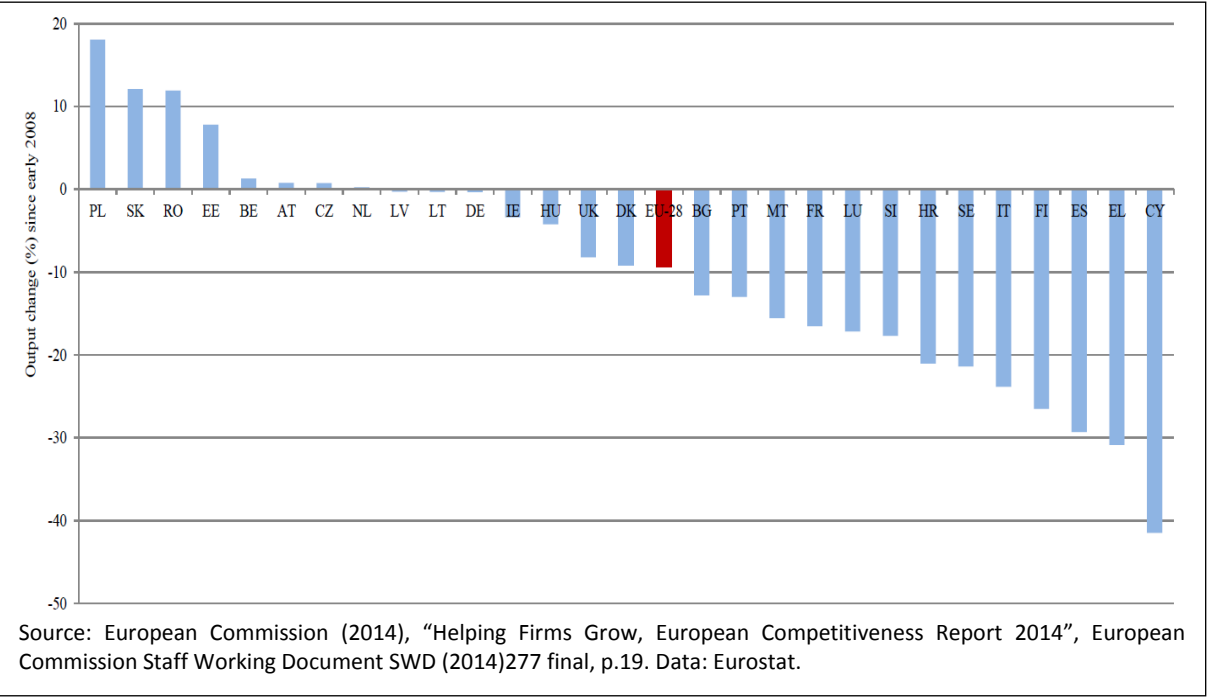


Figure 6: Manufacturing recovery by Member State 2008 – 2014



Different trends in Member States are explained by different factors. As already hinted, industrial policy is a cross-cutting area and manufacturing performance relies on a wide range of competitiveness drivers. It is the interaction between those drivers, which determines firms' competitive position and focusing merely on one of them while neglecting the others would be wasteful. Therefore, differences in national manufacturing performance are explained by divergences in the major drivers of competitiveness. Understanding the factors behind a high level of productivity and competitiveness has been the subject of numerous studies. In this respect, the World Economic Forum has set up the Global

Competitiveness Index, a comprehensive tool that measures the microeconomic and macroeconomic determinants of national competitiveness¹³. These determinants are grouped into 12 pillars of competitiveness¹⁴. They sketch out the contours of good framework conditions in which European firms should operate and have a direct impact on input factors, i.e. the factors utilised in the production of goods. This section sheds light on some of them, in particular the level of labour productivity, access to finance, and innovation performance, and points out to the profound divide between Member States.

In Figure 7, one can see that the level of labour productivity varies considerably between Member States. While countries from Central and Northern Europe are the top performers, Southern and Eastern ones have a relative low level of labour productivity.

Figure 7: Apparent labour productivity in manufacturing (by NACE rev. 2) by Member State, 2011

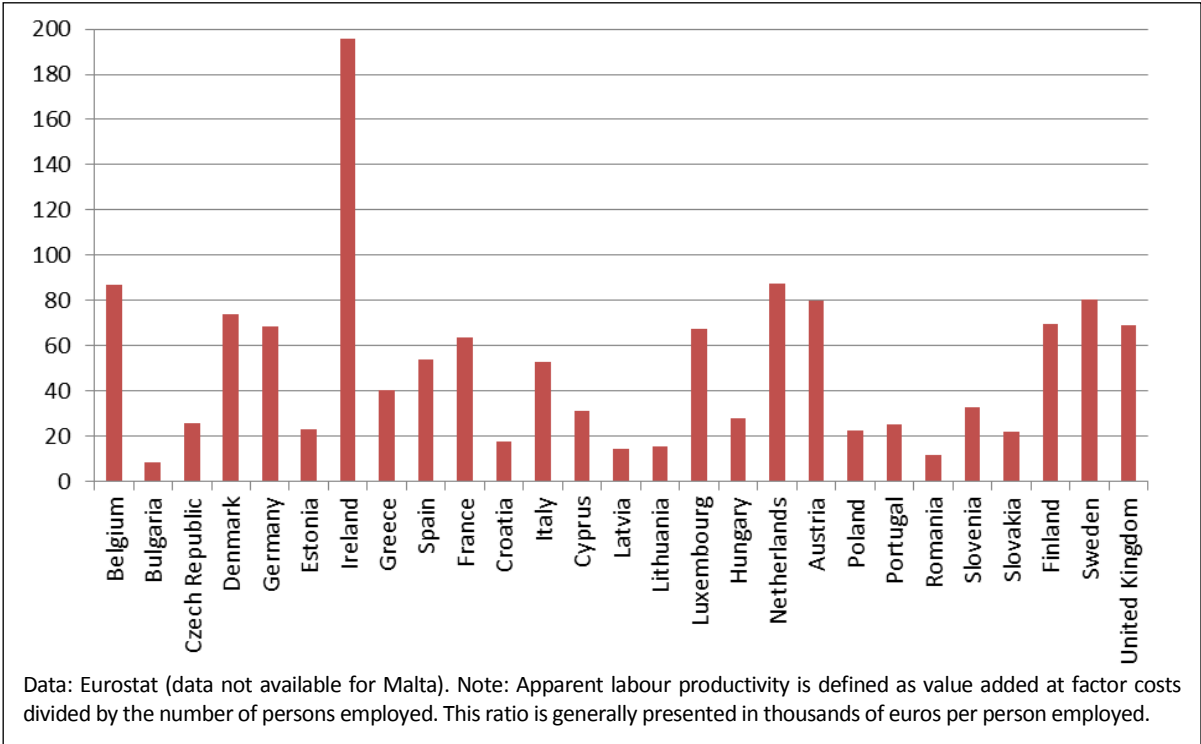


Figure 8 gives an indication of SMEs’ access to debt and equity finance across the EU. Most of the countries which were more severely affected by the economic crisis, like Greece, Portugal, Spain and Italy, figure among the worst performing countries.

¹³ For more information on the performance of EU countries in the Global Competitiveness Index, see the online ranking available at: http://www3.weforum.org/docs/GCR2014-15/GCR_Rankings_2014-2015.pdf, last accessed on: 10 November 2014.

¹⁴ See, Sala-I-Martin X., Bilbao-Osorio B., Di Battista A., Drzeniek Hanouz M., Galvan C., Geiger T. (2014), “The Global Competitiveness Index 2014-2015: Accelerating a robust recovery to create productive jobs and support inclusive growth”, World Economic Forum, Geneva.

Figure 8: SMAF index, EU Member States, 2012

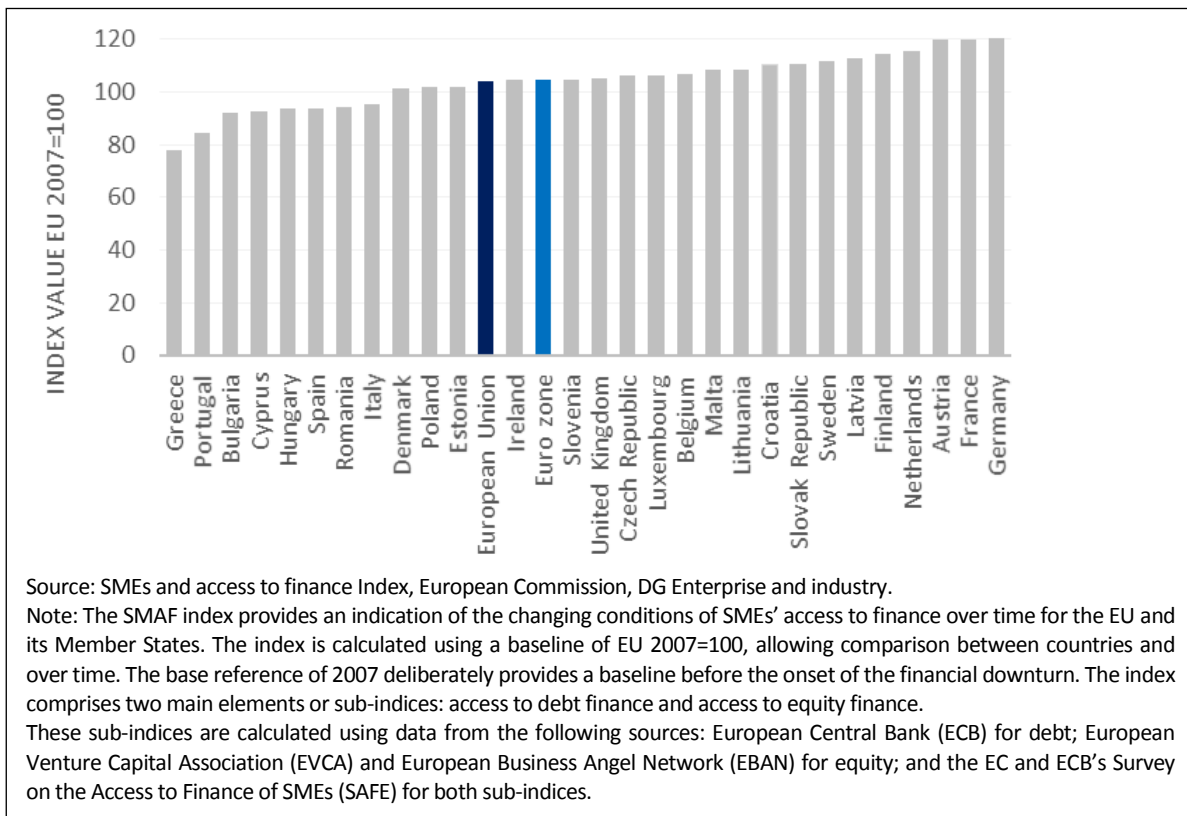
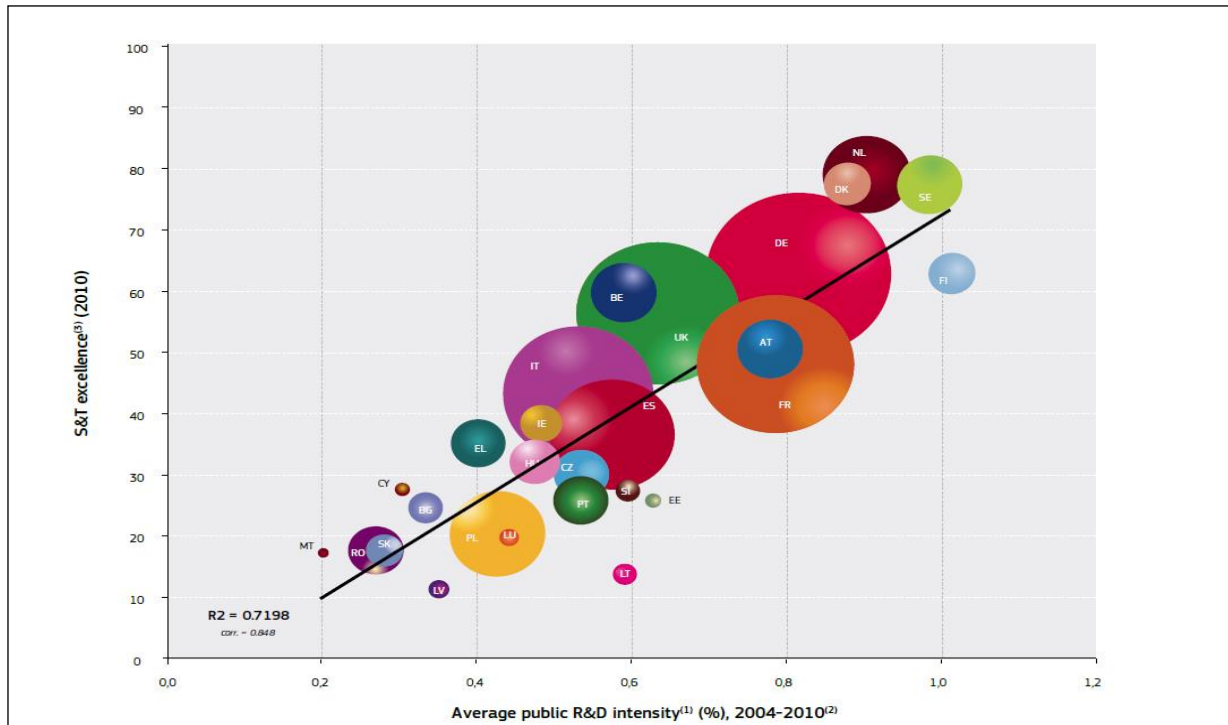


Figure 9 gives an idea of public R&D expenditure in each country and the performance in Science and Technology excellence, showing that there is a strong correlation between the two. However, this correlation does not hold true for all countries, indicating that the quality of spending also matters. This point is further illustrated by Figure 10, which shows that other factors also play a role in a country's innovation performance.

It is thus a set of factors which explains the long and persistent fragmentation of the European industrial landscape and which has contributed to the co-existence of different industrial models in Europe. Nowadays, the EU is composed, on the one hand, of strong industrial bases in countries like Germany, which hold a robust position on global markets and whose model is clearly export-oriented and, on the other hand, Member States with relatively high commercial deficits (like France, Spain, Portugal, Greece and Italy) and in some cases, little industrial diversity. Pursuing economic integration whilst having very different industrial models has been often considered risky in several respects. From an internal point of view, both significant differences in manufacturing output as well as the predominance of national interest in the way industrial policy is carried out, represent clear obstacles to the well-functioning of the Single Market. Furthermore, the diversity of non-coordinated investment does not favour trans-border projects or the emergence of European networks. From a monetary perspective, the strong cleavage between the demand-driven and the export-oriented models represent weak foundations for the currency union. For instance, Germany's high surplus of exports over imports has recently raised discussions about its possible detrimental impact on other EU economies¹⁵.

¹⁵ For more information on the possible consequences of European fragmentation in manufacturing output, see Dhéret, C. (2014), "Sharing the same vision – The cornerstone of a new industrial policy for Europe", *EPC Discussion Paper*, European Policy Centre, Brussels.

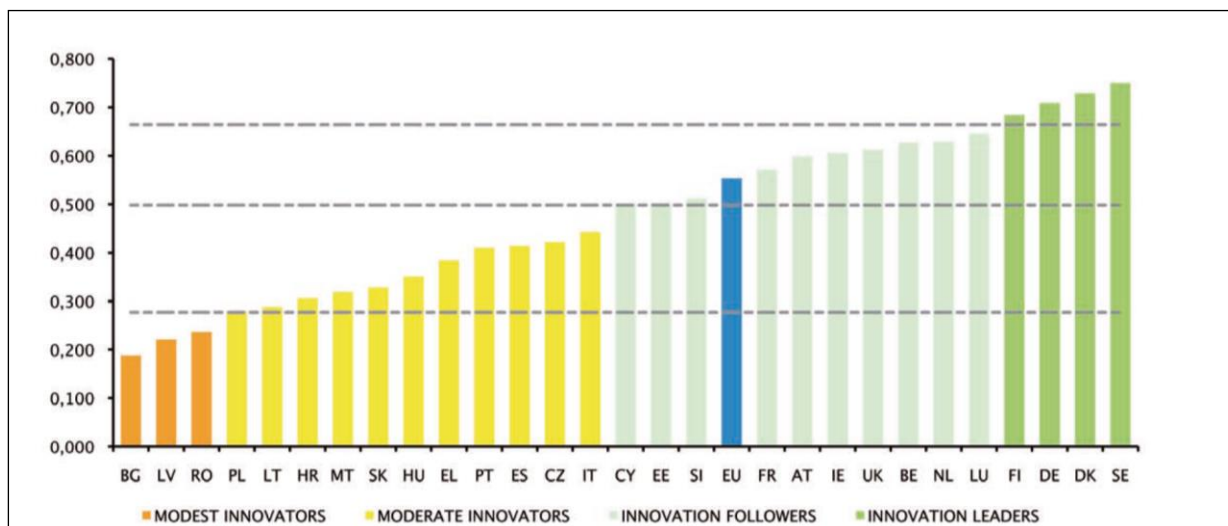
Figure 9: Investment and research excellence



Source: European Commission (2012), “State of the Innovation Union Report 2012, Accelerating Change”, p. 9. Data: Eurostat.

Note: (1) Average public R&D Intensity (public Gross Domestic Expenditure on R&D as % of GDP). (2) EL 2004-2007; SE-IT: 2005-2010; LU 2009-2010. (3) Composite indicator on Science & Technology (S&T) excellence (feasibility study of JRC).

Figure 10: EU Member States’ innovation performance



Source: European Commission (2014), “Innovation Union Scoreboard 2014”, p.5.

Note: The vertical axis represents the average innovation performance and it is measured using a composite indicator building on data for 25 indicators going from a lowest possible performance of 0 to a maximum possible performance of 1. The performance of Innovation leaders is 20% or more above that of the EU27; of Innovation followers it is less than 20% above but more than 10% below that of the EU27; of Moderate innovators it is less than 10% below but more than 50% below that of the EU27; and for Modest innovators it is below 50% that of the EU27.

For more information see, Hollanders H, Tarantola S. (2011) “Innovation Union Scoreboard 2010 - Methodology report”, Januarv.

TOWARDS A NEW STRATEGIC VISION FOR INDUSTRIAL POLICY IN EUROPE

3.1	The evolution of the industrial policy thinking – What can be learned?	12
3.2	Towards the operationalisation of European cooperation in industrial policy	16

Developing a strategic vision for the future of industrial policy in Europe requires taking a step back in time. Industrial policy thinking in Europe has gone through different phases and has evolved over time according to economic circumstances. Understanding this evolution and what shaped it can prove very useful in assessing the extent of which today's industrial policy differs from previous decades, and to redefine a new strategic vision for industrial policy in Europe. Against this background, this chapter will first cast light on the evolution of the industrial policy thinking by reviewing the different role public authorities have played over time in supporting European industry and in upholding its competitiveness globally. Based on this observation, this chapter will reflect upon what kind of industrial policy Europe needs in view of becoming better adapted to present circumstances and adequately equipped to deal with current challenges.

3.1 THE EVOLUTION OF THE INDUSTRIAL POLICY THINKING – WHAT CAN BE LEARNED?

The question of how to optimise the role of public authorities, in particular the state, and to improve industrial competitiveness has been a matter of intense debates for decades and has led to several policy approaches over time. In parallel, scholars have analysed the evolution of industrial policy thinking in order to pinpoint the main features, which have characterised its different phases. According to the literature, the industrial policy thinking can be divided into three sequential phases since the end of the Second World War: from the 1950s to the late 1970s, from the early 1980s to the early 2000s, and from the early 2000s to present¹⁶, evolving from product market intervention, to *laissez-faire* policies and to focus then on interventions that help build systems and facilitate co-ordination¹⁷. Obviously, the implementation and the intensity of the rationale may vary from one country to another. In addition, some events and political decisions may sometimes contradict the overall approach in each period. Some industrial sectors may also have required specific policies diverging from the mainstream thinking. The objective of this chapter is, however, not to look at

¹⁶ The exact timing of each phase may vary from one study to another, depending on which country is subject to the analysis and/or on which political event the focus is placed. The sequencing presented in this chapter is mainly inspired by the following paper: Owen, G. (2012) "Industrial policy in Europe since the Second World War: what has been learnt?", *ECIPE Occasional paper No. 1*, Brussels.

¹⁷ Warwick K. (2013), *op. cit.*

details or sectoral specificities but rather to identify the main trends. A certain degree of generalisation is, therefore, unavoidable.

The first phase of the industrial policy thinking was characterised by targeted intervention of European governments since industrialisation was seen as one of the most important missions the state had to pursue. Obviously, this rationale was nurtured by the damages caused by the Second World War. Industrial production needed to be restored and the damages repaired. To this end, various instruments were used, including subsidies for research and development, preferential procurement, promotion of national champions and the encouragement of mergers¹⁸. The European Coal and Steel Community (ECSC), signed in Paris in 1951 and based on the idea of pooling the French and German coal and steel industries, had the objective of contributing to Member States' economic expansion; of increasing the standard of living; and of creating employment. It can be seen as the premise of a European industrial policy. Coal and steel were considered at that time vital for the economy and, together with the electric and the railway industry, they were heavily supported by governments¹⁹. Furthermore, many firms were nationalised and import tariffs and quotas were used in view to protecting domestic companies, in particular infant industry. That being said, it should be recalled that the Treaty of Rome, signed in 1956, did not contain any provisions relating to industrial policy²⁰.

The same traditional rationale went on in the 1960s and 70s, although some changes occurred at the EU level. The objective of catching up with US technological and production levels played a decisive role in shaping European governments' approaches. With US advances in mind, EU Member States started to explore possibilities to join forces in the scientific and technical research. Technological cooperation was at its embryonic stage²¹ but a number of collaborative projects started to be funded by the European Commission from the early 1970s onwards. By the same token and in order to oppose increased US investment in Europe's high-tech industries, a first memorandum was signed in 1970 by the European Commission, suggesting the creation of European companies. Another factor explaining both governments' active interventions and the emerging idea of a Commission's stronger role in industrial policy was the oil crisis of 1973-74 and the following recession, which affected several industries, in particular the steelmakers. This prompted strict controls on pricing from the Commission in this particular sector, which were made possible due to the previous powers acquired through the European Coal and Steel Community²².

The targeted industrial policy measures came to a halt at the end of 1970s. While governments had paid particular attention to the risks of market failures, they had underestimated those associated with government failures²³. They thus took the opposite direction by the early 1980s. This was the beginning of the second phase, which lasted until the late 1990s and was characterised by trade liberalisation, privatisation of public owned companies and a greater reliance on competition and

¹⁸ Owen G. (2012), *op. cit.*

¹⁹ Naudé, W. (2010), "Industrial Policy – Old and New Issues", United Nations University, World Institute for Development Economics and Research, September, Helsinki.

²⁰ Owen, G. (2012), *op. cit.*

²¹ New bodies, such as the *Politique de Recherche Scientifique et Technologique* (PREST) (in the mid-1960s) and the European Cooperation in the Field of Scientific and Technical Research (COST) (in the early 1970s) were created to organise research and scientific collaboration.

²² Owen G. (2012), *op. cit.*

²³ Government intervention to resolve market failures can also fail to achieve an efficient allocation of resources. Government failure is a situation where government intervention in the economy to correct a market failure creates inefficiency and leads to a misallocation of scarce resources.

market forces²⁴. This deregulation and liberalisation phase has even been identified by some influential voices as one of the drivers of the financial crisis of 2008²⁵. Following the free-market ideologies and the *laissez-faire* view advocated by the Reagan and Thatcher governments, the risks of government failures had to be reduced to the minimum, limiting government intervention to “a ‘narrow set of market failures’” (such as education and infrastructure)²⁶. Priority was therefore given to horizontal measures instead of targeted ones and industrial specialisation was left to market forces, which led to the emergence of sectoral imbalances²⁷ in the economy. Furthermore, the difficult economic situation marked by surging unemployment and high inflation led governments to focus on policies aiming at stabilising monetary policy, lowering inflation, and keeping public expenditure under control. The best illustration of this period was of course what occurred in the UK under the Thatcher government and even under the Conservative government that followed. In other countries like Germany and France, the same policy direction was confirmed despite some variations in time and intensity. A series of privatisation programmes also took place even if not at the same extent as in the UK.

At EU level, it was the time of further economic integration and some major initiatives also reflected the greater reliance on markets. The most significant step towards further integration was the Single European Act of 1986, which removed non-tariff barriers, impeding cross-border trade and trans-European competition. New sectors previously protected by governments, such as telecommunications, were opened up to competition and new EU legislation was introduced to tighten control over public subsidies. In other words, this period increased the role of EU competition policy and put it as the centre of industrial policy. In parallel to the Single European Act, the move towards more cooperation in research went on with the creation of many programmes funded by the EU. The objective was already at that time to foster industrial cooperation between Member States in order to catch up with competitors in technological innovation, in particular Japan and the US. Thus, EU funds aimed to pool resources and to bring together companies, universities and research institutes across Europe. Yet the outcomes of EU initiatives did not live up to the ambition. The Single European Act certainly increased the competitiveness of some specific industries, especially in mobile telephones, but fostering inter-country and inter-company cooperation proved very difficult. The structure of European industry remained very similar to the one of previous decades. In addition, the research programmes did not translate into significant commercial success²⁸.

Against the background of these mixed results, of growing competition not only from traditional competitors like the US but also from emerging economies, and of the outsourcing of manufacturing activities (not only for low-value-added labour-intensive activities but also for high-technology productions) to countries like China, the rationale for industrial policy started to change again. The early 2000s marked the beginning of a third phase where governments adopted a new approach, which can be characterised as somewhat in-between the traditional interventionist strategy and the *laissez-faire* policies of the 1980s and 1990s. The belief that governments should take up a coordinating role, facilitate innovation rather than targeting specific industries, focus on correcting ‘systemic failures’ instead of market failures started to spread across Europe. This systemic approach aims to ensure that the system does not contain any obstacles to firms’ growth and industrial development. It recognises the role of governments in providing supportive institutions and a broad

²⁴ Naudé W. (2010), *op. cit.*; Aghion P., Boulanger J., Cohen E. (2011), “Rethinking Industrial Policy”, *Bruegel Policy Brief, Issue No. 4*, Brussels.

²⁵ Warwick, K., (2013), *op. cit.*

²⁶ Naudé W. (2010), *op. cit.*

²⁷ See, interview of Cohen, E., “La France doit changer de modèle économique”, 15 April 2014, Xerfi Canal, available at: http://www.xerficanal-economie.com/emission/Elie-Cohen-La-France-doit-changer-de-modele-economique_1522.html, last accessed on: 24 October 2014.

²⁸ Owen G. (2012), *op. cit.*

set of horizontal policies conducive to competition, innovation and industrial change. Some scholars characterise this approach as ‘soft’ industrial policy²⁹, whose goal is “to enable closer co-ordination between individual economic agents and to allow for experimentation in the economy”³⁰. This rationale has been the mainstream thinking until now.

The systemic approach did not, however, prevent governments from bringing financial support to industry but public intervention tended to be more strategic in nature, to move away from support for single firms and to focus more on activities and technologies. This rationale, although still prevailing amidst policy makers, has been slightly altered by the economic and financial crisis. Indeed, sectoral targeting has been significantly reinforced in the aftermath of the crisis and were either presented as extraordinary measures to stimulate the demand in sectors strongly hit by the crisis³¹ or as public support for firms embarking on a relocation of manufacturing activities in the home country³². This approach was based on the belief that a certain share of manufacturing activities is vital for the recovery and that public policy is necessary to rebalance industry with the service sector.

Many initiatives undertaken at the EU level also reflected the change of rationale and confirmed the resurgence of interest in manufacturing activities and the move away from free-market ideologies. Among them, it is worth noting the different Commission communications stressing the need for a re-industrialisation strategy and the introduction of the 20% target mentioned earlier in this paper, the modernisation of state aid policies (see section on the role of public authorities), as well as the supportive actions for advanced technologies (see section on innovation).

All in all, this section has shown that the industrial policy thinking has gone through different phases and has been adjusted over time. Events like the oil crisis of 1973-74, the competitive gap with major industrial countries, the growing competition from emerging economies, or the economic and financial crisis starting in 2008 played a key role in shaping the industrial policy thinking. In addition, one can notice that policy practices tend to follow the evolution of the economic thought prevailing in each period³³.

Despite these observations, some scholars have argued that “*practice in industrial policy does not vary as much as the typical, quite out-dated rhetoric may suggest*”³⁴. This might be true in some cases, especially with regard to the European dimension of industrial policy. For instance, the Airbus model, based on specialised production sites in several EU countries and largely praised as a ‘European success story’, has not been replicated in other industries. The aircraft sector has certainly peculiar features, including high capital intensity and significant economies of scale, which facilitated European cooperation. Despite these peculiarities, model of this kind could be replicated in other industries if the political will were stronger. Furthermore, one should recognise that the structure of European industries has changed less radically than the environment in which they operate. In other words, European industries nowadays face challenges, which are completely different from the ones of some decades ago, while the policy framework has remained fairly similar. Indeed, despite further European economic integration and several attempts to pool resources together, in the research area in particular, industrial policy is still primarily shaped by national policies.

²⁹ See Harrison A., and Rodriguez-Clare A. (2010), “From hard to soft industrial policies in developing countries”, VoxEU.org, available at <http://www.voxeu.org/article/hard-soft-industrial-policies-developing-countries>, last accessed on: 24 October 2014.

³⁰ Warwick K. (2013), *op. cit.*, p.24.

³¹ The certainly best example is the automotive industry, which has been largely bailed out not only in Europe but also in the US.

³² See for instance an interview of the French Minister Arnaud Montebourg about its ‘re-shoring campaign’, available at: http://www.dailymotion.com/video/x120f6k_it-12-13-de-france-3-centre-sur-la-fonderie-loiselet-16-07-2013_news, last accessed on: 4 November 2014.

³³ Vanden Bosch X. (2014), “Industrial policy in the EU: A guide to an elusive concept”, Academia Press, *Egmont Paper 69*, Brussels.

³⁴ *Ibid.*, p.27.

Against this background and given the magnitude of the challenges faced by European industries, the authors of this paper argue that now is the time to initiate a fourth phase of industrial policy in which European cooperation is truly operationalised.

3.2 TOWARDS THE OPERATIONALISATION OF EUROPEAN COOPERATION IN INDUSTRIAL POLICY

Industrial policy in Europe needs to have a sense of urgency and to be adequately designed to address on-going challenges. As described in the previous section, changes in the evolution of the industrial policy thinking have mainly concerned the nature of public interventions (through either specific targeting or horizontal measures) and/or have focused on how governments should best interact with market forces. Although reflecting upon these aspects is crucial, there is also an urgent need to think about the multi-level governance structure of EU industrial policy, to go beyond the limited scope of individual national strategies and to revisit the role of the EU.

Recent communications of the Commission have emphasised on the need to raise manufacturing production in Europe and to step up efforts to improve European industry's competitiveness. To this end, the Commission has called EU Member States to pursue a holistic approach to industrial policy and to refine their strategy in order to mainstream "*industry-related competitiveness concerns across all policy areas*"³⁵.

But such calls are unfortunately nothing new. They have been heard so many times in the past that one may question the real impact of using catchy phrases such as *industrial renaissance*. Ambitious rhetoric is not sufficient and it should be made sure that this is simply not more of the same. Reality shows however, that Europe's approach is highly path-dependent. The budget allocated to industrial policy at EU level has remained very limited: only 16.5% of the EU budget³⁶ was dedicated to innovation policy over the period 2007-2013 and the share of total EU spending on R&D in GDP represented around 2% in 2011³⁷.

In addition, the governance structure of EU industrial policy has been historically very weak, if not non-existent. The Union does not have a clear mandate to act in this policy area and measures aiming to drive industrial change are either relying on instruments from other policies, mainly internal market provisions, competition policy and trade policy, or on soft tools allowing consultation and coordination between Member States³⁸. This governance structure is mainly due to the resistance of Member States to endow the EU with more forceful instruments. As a corollary, this structure can generate tensions between the European and national level and create a framework in which European and national powers constrain each other³⁹. A result of such a weak governance structure is the lack of alignment of strategic priorities (both within the European Commission and between the EU and national level), which significantly minimise their possible impact. Studies have

³⁵ European Commission (2014), "For a European industrial renaissance", COM (2014)14/2, p.22.

³⁶ CEPS (2010), "A new approach to innovation policy in the European Union innovation policy: Boosting EU competitiveness in a global economy", *CEPS Task Force Report*, Brussels.

³⁷ European Commission (2013), "Innovation Union Competitiveness Report 2013", European Commission Staff Working Document, p. 17. United States' expenditure on R&D in 2011 was around 2.7 % of GDP, South Korea's one was around 4% and Japan's expenditure was around 3.4% of GDP.

³⁸ See, Dhéret, C. (2014).

³⁹ See, recent exchange of letters on state aid surveillance between Mr Montebourg, French Minister of industrial renewal from 2012 to 2014 and Mr Almunia, EU Commissioner for Competition from 2010 to 2014: "War is declared between Montebourg and Almunia", Euractiv, 27 January 2014, available at: www.euractiv.com/trade/war-french-minister-eu-competiti-news-533012, last accessed on: 30 October 2014.

shown that the six EU priority action lines mentioned earlier in this paper have not always been taken up in national re-industrialisation roadmaps⁴⁰. This leads to a scattering of investment and points to the lack of coordination between governance levels. Instead, ensuring the success of EU action lines would require investment with a critical mass and a better alignment of priorities at EU level and across governance levels.

In order to overcome these tensions, to avoid a dissipation of efforts and resources, and to enable European industry to fully enjoy the benefits of being part of the EU, Europe needs a fully-fledged strategy based on a more collaborative approach and a better optimisation of EU strengths.

The still prevailing thinking, which consists of considering competition and industrial policy, on the one hand and national and European interests, on the other hand, as two conflicting objectives has demonstrated its limitations. The challenges faced by EU industry are too big to continue on the same path. The significant interdependence of our EU economies, in particular in the Eurozone, as well as the greater resilience of EU Member States with a solid industrial base against the economic crisis, confirm the necessity of having a balanced economy with robust industries spread all over the territory. Such an objective will be difficult to achieve without a greater degree of cooperation and coordination and the creation of a real EU mandate.

European cooperation should, by no means, undermine market competition but be rather implemented in view to strengthening Europe's comparative advantage towards the rest of the world. All aspects of cooperation need to be considered, be it across governance levels, between Member States, among industries and between the private and public sector. Furthermore, it should help the EU and its industry to establish a strategy in which the diversity of industrial specialisations and industry's structure, the pool of human capital, and the size of the Single Market are turned into a competitive advantage. Europe has many assets, including a very skilled labour force, generally well-governed public institutions, and a Single Market of 500 million consumers, which are not fully exploited.

The operationalisation of European cooperation in industrial policy will certainly require a paradigm shift as history has shown that mobilising actors for achieving common objectives is hard to implement. Furthermore, national interest has always taken precedence over the community interest. But the magnitude of the challenges faced by European industry as well as the rapidity of technological changes and the rise of powerful global competitors gives no alternative to the EU but to act together, notably if the EU really wants to maintain a high level of economic and social cohesion between its Member States. On the contrary, applying today's model is likely to increase the divide among winners and losers and to nurture economic imbalances within the EU.

Certainly the operationalisation of European cooperation will raise a number of questions, not least with regard to its concrete implementation. In order to answer some of them, chapter 4 sketches out the foundations of this new strategy by presenting a tool kit for its implementation.

⁴⁰ See Dhéret C. (2014), *op. cit.*

A TOOLKIT FOR IMPLEMENTING THE VISION

4.1	Requirements preparing the ground for a genuine vision	20
4.1.1	Ensuring better and smart regulation	20
4.1.2	Investing in human capital	22
4.1.3	Optimising the role of public authorities in improving European industry's competitiveness	27
4.1.4	Facilitating access to finance across the whole EU	30
4.2	Implementing the two guiding principles of the new strategic vision	35
4.2.1	Towards a more collaborative approach	35
4.2.2	Optimisation of EU strengths	44
4.3	Enhancing sophistication factors	53
4.3.1	Boosting innovation	53
4.3.2	Becoming a leader in new business models	57

Turning European cooperation in industrial policy into reality requires a concrete action plan with a certain degree of prioritisation. This chapter will present a toolkit for implementation based on three stages as pictured in Figure 11. Stage one deals with the requirements needed for preparing the ground for the implementation of the new strategic vision. Stage two deepens the vision's contours sketched out in chapter 2, defines its two guiding principles consisting in a collaborative approach (1) and the optimisation of EU strengths (2), and presents actions to make them realise. Last but not least, stage three elaborates on two sophistication factors, which are necessary to complete EU strategy on industrial policy. These three stages are mutually-reinforcing in many aspects and none of the actions developed under them are self-sufficient. In other words, the strategic vision can only become a success if implemented in an integrated manner.

In the three stages, content information (sometimes backed by concrete examples developed in the blue boxes) is provided before the elaboration of policy recommendations. The transversal nature of the topic and the inter-dependence of policy actions to boost industry's competitiveness in Europe explains why there is cross-referencing throughout chapter 4. In line with the need for an integrated approach, the suggested toolkit has to be taken in its entirety instead of being seen as a series of separate actions. Lastly, the stakeholders targeted by the policy recommendations, be it EU institutions, public authorities at the national and regional level, or the industry itself may vary depending on the issue.

Figure 11: A toolkit for implementing a new vision

1. Requirements preparing the ground for a genuine vision

- Ensuring better and smart regulation
- Investing in human capital
- Optimising the role of public authorities in improving European industry competitiveness
- Facilitating access to finance across the whole EU

2. Implementing the two guiding principles of the new strategic vision

Towards a more collaborative approach

- Building up a complete industrial eco-system
- Turning the smart specialisation concept into reality
- Facilitating the Europeanisation of the value chain

Optimisation of EU strengths

- Completing the internal energy market
- Strengthening the external dimension of European growth

3. Sophisticating factors

- Boosting innovation
- Becoming a leader in new business models

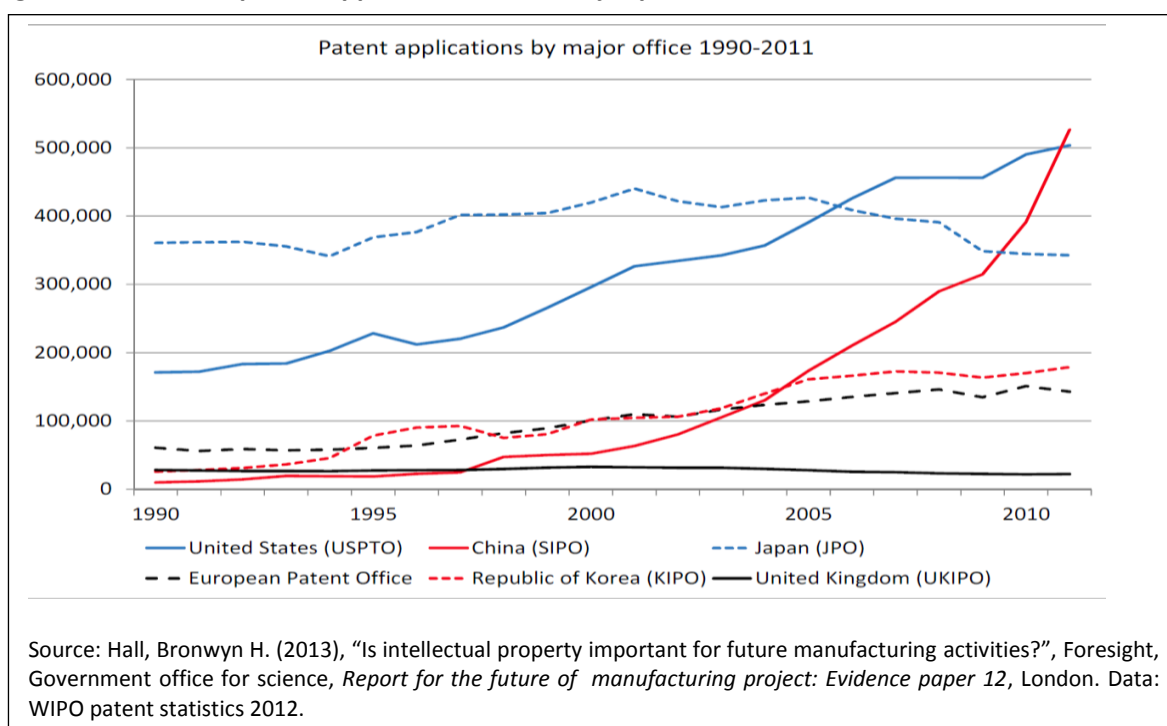
4.1 REQUIREMENTS PREPARING THE GROUND FOR A GENUINE VISION

4.1.1 Ensuring better and smart regulation

Better and smart regulation is a significant element of good framework conditions needed by industry. Starting a company or developing its expansion require a number of administrative tasks, which can either be facilitated or complicated by public authorities. Registration of a firm, certification of products and services, requirements related to emissions and the security of produced industrial goods, protecting intellectual property rights, and technical standards are some examples. Besides the time-intensity required by such proceedings, they also have implications on firms' budgets. Indeed, too much red tape and the inability to access appropriate services impose additional costs on firms and can slow down the process of business expansion. Overregulation and heavy bureaucracy are therefore a determining factor when firms have to make a decision on their location. In addition, these aspects also impact entrepreneurial behaviour.

A key element of a regulatory framework which is particularly relevant for industry is intellectual property protection. This regulatory tool has become a key instrument with the rise of the knowledge economy and enables firms to generate a high return on their R&D investment. Evidence says that worldwide patent applications have increased from about one million in 1990 to over two million in 2011. Figure 12 shows the significant rise of patenting in China, and also in the US (even to a less extent), while the upwards trend in Europe is much softer. This is particularly important in the age of rapid technological innovation and fierce competition from emerging economies. As highlighted by box 1, intellectual property right can also have spill over effects on industry's other competitiveness drivers such as innovation. On the contrary, the absence of such an instrument can have a detrimental effect on the economy and on its capacity to attract manufacturing activities and foreign direct investment. Countries where there is a high risk of technologies being stolen or copied are not attractive for business.

Figure 12: Trends in patent applications at the major patent offices



Box 1 | Intellectual Property Rights (IPR) – A regulatory instrument to fostering industry's development

Patents, trademarks, copyright, industrial designs, and geographical indicators (GI) are types of immaterial assets referred to as Intellectual Property (IP). They are protected by legislation, and can be advanced, owned, managed and commercialised to develop business activities and generate economic returns. Enterprises must take advantage of IPR and turn them into profitable businesses.

IP is among the key drivers of economic development and employment. On average, 40% of the value of a company that tied up in its intangible assets is not shown in any way on its balance sheet. Studies, using a WIPO developed methodology, document that there is positive and highly significant relation between the contribution of the copyright industries to the GDP and innovation and competitiveness.

In the EU, IP-intensive industries generated more than one out of four jobs between 2008 and 2010. They contributed to 35% of the employment; generated 39% of the GDP, equalling €4.7 trillion; and represented around 90% of EU external trade, with copyright-, design- and GI intensive industries offering a positive trade balance.

Case studies showing the importance of IP for the development of industries are available from various sources. Italian company Geox is an example of how businesses can progress through efficient exploitation and protection of IP rights. Its success is based on the exploitation of more than 60 patents registered worldwide, design and branding. In less than 20 years, Geox developed into becoming Italy's leading shoe manufacturer, growing from five employees in 1995 to a workforce of nearly 3,000 and an annual turnover of more than €800 million in 2012. The application of innovative and technological solutions developed by Geox and protected by patents as well as the strong recognition of the Geox brand figure as the main assets of the company.

Author: Olav Stokkmo, Chief Executive, IFFRO (International Federation of Reproduction Rights Organisations)

Source: Website of the World Intellectual Property Organization, available at :

<http://www.wipo.int/portal/en/index.html> ;

Geox (2012), "Annual Report", available at:

http://www.geox.biz/pdf/2013/ENG/ING_Bilancio%20consolidato%20FY2012%20con%20relazioni%20.pdf, last accessed on: 26 October 2014.

Lastly, entrepreneurs and industry representatives often highlight the need for regulatory stability. Companies need to make strategic plans based on solid predictions and to make decisions on which location is best to expand their activities. If governments do not offer a stable regulatory environment and change rules frequently, industry representatives are unlikely to invest and to take risks in this country.

Policy recommendations

Addressing the costs of new EU regulations

- The EU should contribute to regulatory stability and should pay particular attention to the costs that new EU legislation could generate for industry. Close attention should be devoted to policy areas where the EU has key competences such as product safety, work safety and environmental regulation. When new EU legislation leads to significant costs, the EU should offer financial support from the EU budget in order to assure that regulatory changes will not question the viability of businesses.

Minimising red tape

- Member States should ensure that they minimise the costs of the administrative and regulatory framework for industry. E-government and digital solutions can play a key role in reducing the

administrative burden on firms, who need to access necessary information and to undertake administrative formalities. In this respect, best practices exist in the EU and Member States could learn from each other. To this end, the EU could provide a platform enabling Member States and regions to exchange best practices.

Developing a globally competitive IP policy

To further strengthen the European industry's ability to benefit from IP in their business and product improvement strategies, there is an urgent need for the EU to develop and implement a clear IP policy like countries such as Australia, China, Japan and the UK, which already have IP strategy plans⁴¹. To this end, it is essential that EU IP policy fulfils the following tasks:

- establish an administration and management of IPR at EU level;
- ensure that industry can easily access IPR in universities and research institutes;
- ensure that IPR are enforced within and outside the EU;
- provide supportive programmes to businesses to better develop their IP strategies and to take advantage of its IPR;
- include IPR in EU trade agreements;
- protect the EU's technological knowledge by making sure that projects developed by EU and national public funding entail a clear IP plan for both the ownership and first exploitation of IP. In the case of EU funding, the European Commission should have the possibility to decide whether the beneficiary, be it a public research organisation or an industrial company, can license its results to a non-EU party. In addition, licenses from European funded public laboratories should only be granted to European based industries⁴².

4.1.2 Investing in human capital

Providing industry with the requested pool of skills is a crucial pre-condition for ensuring European industry growth in the medium-to long run. In order to address this challenge and to achieve a better match between skill supply and labour market needs, several EU initiatives have attempted to provide better information about the skills situation in different sectors. Anticipating future skills needed by the industry requires indeed a good understanding of the future evolution of manufacturing in Europe.

In this respect, it is forecasted that trends highlighted in chapter 2 will pursue the same path. Indeed, employment in manufacturing is unlikely to increase again⁴³ and studies have even indicated that the largest impact of the reduction in manufacturing employment will be on low skills jobs⁴⁴. However, it should be stressed that these forecasts are based on linear projections and do not take into account the possible implications of a re-industrialisation strategy. More information on the content of such a strategy would be very useful for a better anticipation of sectoral structural changes and occupational structures.

⁴¹ World Intellectual Property Organisation (WIPO), "IP Asset Development and Management: A key strategy for economic growth", *WIPO Publication no. 896E*, Geneva.

⁴² European Commission (2011), "Final report from the high level expert group on key enabling technologies", June.

⁴³ A McKinsey study shows that "the share of manufacturing jobs in total employment declines in all nations after they reach a certain level of wealth (...) dropping to 8 to 20% of jobs in advanced economies, from about 25 to 35% in middle income nations". The study adds that "today, service sector industries create eight out of ten net new jobs globally; see Manyika J., Sinclair J., Dobbs R. et al. (2012), "Manufacturing the future: the next era of global growth and Innovation", McKinsey Global Institute.

⁴⁴ Cedefop (2010), "Skills supply and demand in Europe, Medium-term forecast up to 2020", Thessaloniki.

Despite these caveats, EU countries will have to continue efforts to move up the value chain and to interact with a globalised economy. Therefore, manufacturing firms will continue to operate in emerging markets, to produce customised products, to apply new technologies (see section on innovation) and new production processes (such as eco-design, further elaborated in the section on new business models) across the whole production chain and to be closely embedded in the service economy.

Against this background and as forecasted by different institutes, Europe's manufacturing will face a growing need for high skill production workers able to produce complex products, to become more innovative, and to swiftly adapt to an evolving production environment driven by rapid technological changes. At the same time, highly skilled workers will have to be able to manage risks, take responsibility and organise complex information. They will have to perform transversal tasks and to work in cross-functional specialities. Hence, at a time of the rapid expansion of higher education systems, Europe will have to compete to attract and retain highly skilled workers⁴⁵ in order to build a global talent pool. In particular, access to R&D talent will remain key for designing complex and innovative products. This will continue to be a growing concern given that researchers operating in Europe are heavily constrained in their activities and that R&D organisations tend to globalise and disperse.

In addition, medium skilled workers will also remain important as they are expected to represent the majority of the European labour force⁴⁶. They will be particularly relevant to support the jobs of highly skilled people and their activities will also become more knowledge and skill-intensive. Medium-skilled occupations in industry include metal and machinery workers and machine operators and assemblers and do therefore require technical skills⁴⁷.

Technical skills have, however, been neglected over the last few decades. As a result, current trends in skill supply, not least for medium skills, highlight a significant disconnect between education and training systems and industry's needs. One can observe a general scarcity of technical skills, and a growing skills mismatch in small manufacturing firms in some countries, which are likely to augment with many production workers being close to retirement. Such developments are partly due to the structure of education systems, which tend to prioritise academic education at the expense of technical skills. Indeed, curricula enabling young people to acquire technical skills like the apprentice system are underdeveloped in many countries. It also suffers from a bad perception as career in manufacturing is no longer perceived as positively as was the case some decades ago.

However, this trend is uneven across Europe and countries with a strong industrial base are also the ones where close links between industry and education are found. For instance, countries like Austria and Germany⁴⁸ have a strong tradition in the apprenticeship model, which combines formal education and work-based learning. As highlighted by the Austrian example described in box 2, this model is generally accompanied by additional measures enabling an alignment of firms' needs with education content. Such a model is also made possible through the active role of public authorities for supporting the vocational education and training (VET) system and for alleviating the burden of training costs that small and medium-sized enterprises (SME) may not afford.

⁴⁵ The EPC has proposed several measures to increase labour mobility both for EU citizens and third country nationals in Europe in view to retain global talent. See: Dhéret C., Lazarowicz A., Nicoli F., Pascouau Y., and , Zuleeg F. (2013), "Making progress towards the completion of the Single European Labour Market", *EPC Issue Paper N°75*, Brussels.

⁴⁶ Cedefop (2010), *op. cit.*

⁴⁷ ISCO 7 and 8 according to the International Standard Classification of Occupations.

⁴⁸ For instance, 88.2% of German VET students take part in a programme combining school and work-based learning.

Box 2 | The benefits of a comprehensive qualification strategy - The example of the Institute for Economic Promotion (WIFI) of the Austrian Federal Economic Chamber

As the largest institution of training and further education of the Austrian Federal Economic Chamber, the Institute for Economic Promotion (Wirtschaftsförderungsinstitut, WIFI) promotes the strong performance and competitiveness of Austrian companies in all its branches. With its knowledge and expertise, WIFI supports their activities in Austria and on international markets. It translates economic, social and technical developments into innovative and attractive training courses.

Genuine partnership with the business community

Leading representatives of the business community and also of industry are involved in decisions about strategy and courses offered through so-called advisory boards. Experts in the fields of human resources and education from companies help develop qualification concepts for various sectors, including for machines/motor vehicles/metal, chemistry/plastics/new materials, and construction and ecological building. This means that entrepreneurs and experts from all sectors of the economy have an influence on the range of training and education programmes offered by WIFI, as a result of which the programmes are geared towards the current and future qualification requirements of companies and their employees.

The courses offered by Austria's market leader in occupational education touch upon a wide range of areas such as management and corporate governance, personal development, languages, business economics, information technology, engineering, specific industries and the vocational matriculation examination as well as foreman schools.

The trainers who work at WIFI come directly from the business world, and most of them teach part-time. This ensures that the information they teach is up-to-date and can be applied directly to day-to-day business. The WIFI's participate in the Standing Committee on New Skills, a project put in place by the Public Employment Service Austria, in order to support Austrian companies, employees and people who are looking for a job. Expert groups from different industries meet regularly to identify mid- and long-term qualification demand on the market. The conclusions of the Committee meetings directly influence the content range of the qualification courses.

A life-long and customised approach

Specifically for companies, WIFI offers in-house corporate training with customised qualification packages for employees. WIFI also offers preparatory courses – as part of the dual training system – for apprenticeship exams and master exams to future managers.

The WIFI's promote accessibility within the Austrian education system (from apprenticeships to master's degrees) by offering diverse qualification models that meet people's needs in various phases of life. In this way, people can obtain an academic degree even without a secondary school leaving certificate.

A strong international presence for more competitiveness

WIFI International, which is responsible for the internationalisation of Austrian educational standards, positions WIFI as an international education provider in Central and South East Europe and strengthens Austria as an education location through international education projects. With over ten WIFI locations in Central and South East Europe, WIFI International helps Austrian companies abroad to provide their employees with higher qualifications by offering Austrian educational expertise in the local language. In this way and through investment in human capital, WIFI International is increasing the competitive strength of Austrian companies in this region. It offers everything from seminars and courses to industry-specific training programmes.

In addition, WIFI International generates added value for the Austrian economy by delivering international education projects. WIFI carries out seminars and management courses around the world, and graduates of these courses are offered the special added benefit of a platform for establishing business contacts with Austrian companies. This platform also benefits Austrian companies as it represents a pool of workers with required skills.

The WIFI's: Facts and figures

- 1 umbrella organisation (WIFI Austria), 9 provincial WIFI's and 80 branches in the WIFI network;
- Approximately 360,00 participants each year;
- Over 32,000 courses, seminars and programmes throughout Austria;
- 12,000 trainers for the transfer of practical knowledge;
- Over 250 state-of-the-art workshops and laboratories and 1,500 training rooms all over Austria that meet the latest standards in technology;
- 5,500 course participants each year in Central and South East countries;
- WIFI locations serve an economic area with over 180 million inhabitants. WIFI is active in Albania, Bosnia-Herzegovina, Bulgaria, Croatia, the Czech Republic, Poland, Romania, Serbia, Slovakia and Hungary as well as through projects in China and the Middle East.

Author: WIFI - Institute for economic promotion of the Austrian Federal Economic Chamber

Industries themselves can also remedy this situation and adapt curricula according to their needs. In this respect, there are interesting examples, as highlighted in box three, of industry coalitions, which tailor curricula to specific needs.

Box 3 | Educate to Innovate - The European Technology Platform for Sustainable Chemistry (SusChem)

In order to innovate successfully and remain sustainably competitive, European industry needs human resources equipped with the right mix of skills. The European chemical industry needs future engineers and scientists with a broader scientific skills set to enable interdisciplinary work, with also appropriate personal skills, and a strategic awareness of business and innovation management issues.

Against this background, the European Technology Platform for Sustainable Chemistry (SusChem) has been launched in order to ensure higher education and to enable the European chemical industry to work together to build skill capacity required for tomorrow.

The Educate to Innovate programme, which is part of SusChem, aims to exploit innovation outputs from SusChem's Research and Innovation (R&I) projects in order to enhance the innovation skills of future generations of European scientists and engineers through the effective engagement of industry and higher education institutions (HEI). To this end, the programme focuses on:

- capturing innovation emerging from SusChem R&I projects that could be used as case studies for the development of educational resources;
- facilitating constructive dialogue and exchange of ideas between stakeholders in industry and HEIs ;
- designing appropriate educational resources that can be used at undergraduate and master level to develop the skills needed to enhance innovation in the chemical and industrial biotechnology sectors.

In addition, SusChem Educate to Innovate aims to leverage education value from innovation projects and to effectively support the availability of appropriate skills for innovation, through the development of innovative learning resources that would:

- enable dissemination awareness, understanding and support exploitation of key innovation output from projects;
- enable students to learn through failure as much as success, understand how/why decisions were made, with documented methodologies for problem-based studies;
- fit with different teaching curricula and learning approaches in order to be easily integrated in existing modules, which can be adapted by teaching staff at undergraduate and master degree and be useful for lifelong learning courses.

The effective implementation of SusChem Educate to Innovate initiatives in the future would require:

- considering the education potential (from undergraduates to lifelong learning) as part of the impact assessment of projects;
- engaging with teaching academics at appropriate stage of the innovation projects;
- integrating educational outputs into projects' exploitation plan;
- extending projects' timeframes to enable effective exploitation of project outcomes into education;
- building appropriate frameworks into project funding mechanism.

Authors: Joint efforts from CEFIC staff.

Source: Cefic (2011), "Skills for innovation in the European chemical industry", available at

<http://www.cefic.org/Documents/PolicyCentre/Skills-for-Innovation-in-the-European-Chemical-Industry.pdf>,

last accessed on: 27 October 2014; Website of CEFIC, available at www.cefic.org, last accessed on: 27 October 2014;

website of SusChem, available at www.suschem.org, last accessed on: 27 October 2014.

Last but not least, it is important to have a workforce able to participate in and provide input to the whole innovation chain. As described by the high-level group on KETs, this innovation chain entails different steps, including technological research, product development and demonstration activities. All these steps are needed to translate research into innovation and to bring innovative products to the market.

Policy recommendations

Equipping people with technological and trans-disciplinary skills through a partnership approach

- Promoting technical skills at school through well-designed apprentice systems based on academic learning and on the job training in factories has demonstrated its merits in several Member States, including Germany and Austria. This is indeed an excellent means to provide young people with transversal skills and to respond to the skill demand of the manufacturing industry. The EU launched a European Alliance for Apprenticeships⁴⁹ in 2013 in order to promote the apprentice system and provide advice on its implementation. Bilateral cooperation between best-performing and struggling EU countries have also been concluded but concrete results remain to be seen. A real commitment is therefore needed from Member States to reform the education system and the key messages of the European Alliance for Apprenticeships need to be better communicated at the regional and local level.
- The involvement of companies is key to better align the education system with industry needs and also to get a better understanding of future skill needs in the manufacturing sector. In this respect, involving the business sector in the design of curricula is of utmost importance.
- Making better use of geographical clusters, partnerships across industries and the regional branches of the Chambers of Commerce and Industry is needed to better structure the skills strategy and to pool resources for investment in human capital.

Positioning the EU as a world leader in technological research

- As recommended by the high level group on KETs⁵⁰, the EU should create a European Technology Research Council (ETRC) to promote individual excellence in technologically focused engineering research and innovation. In the meantime, the current ERC that has seen its budget increased by more than 70% in comparison to the Framework Programme (FP) 7 period, should urgently identify appropriate ways of increasing its role in promoting individual excellence in technological research and innovation. To reflect this ambition, an appropriate target would be to dedicate 15% of the ERC budget to technological excellence.

Making the manufacturing sector and career more attractive

- In order to make apprentice systems more attractive, it is important to recognise tertiary VET qualifications as one of the higher levels of the National Qualification Frameworks and also to create smooth bridges between apprenticeships and full-time tertiary education⁵¹. Lastly, national campaigns are necessary to make manufacturing career more attractive.

⁴⁹ See the website of the European Alliance for Apprenticeships, available at: http://ec.europa.eu/education/policy/vocational-policy/alliance_en.htm, last accessed on: 31 October 2014.

⁵⁰ See High-Level Expert Group on KETs (2014), "KETs for a competitive Europe".

⁵¹ See EUROCHAMBRES (2013), "Reducing youth unemployment to the pre-crisis level by 2018: EUROCHAMBRES' submission to the 12th November Youth Employment Summit", November, Paris.

Devoting particular attention to low-skilled workers

- Learning new technologies should become a priority of the education system at all skill levels so that low skilled workers can also exploit more intelligent manufacturing products and processes and are not excluded from the labour market.
- In order to foster a real job creation policy and to avoid protecting jobs over people, the state has to ensure that mechanisms are put in place to ensure life-long training in all industrial sectors so that people working for industries in decline can move into new economic or industrial areas. Low-skilled workers will continue to be the most affected by globalisation, manufacturing outsourcing and the transition towards knowledge and capital intensive technologies as they often have too narrow competences for occupational retraining. Greater attention needs, therefore, to be devoted to their case.

4.1.3 Optimising the role of public authorities in improving European industry's competitiveness

Public authorities play a pivotal role in the creation and maintenance of a business-friendly environment, in which companies can flourish and operate in a global level playing field. In other words, their role is key in assuring fair competition in the global market, in making sure that policies take account of the external environment and that European industry is not put in a disadvantaged position.

The benefits of competition-driven markets have been recognised for a long time. On the one hand they encourage incumbent companies to increase productivity, improve their system of production, develop economies of scale, and bring more innovative products to the market. Free competition also helps to avoid monopolies by stimulating entry and exit in the market and reinforce competition among firms. In the end, open competition leads to lower prices and higher quality, creating a good deal for consumers. At the same time, EU public authorities have to take into consideration the global environment and the competition that companies have to face at international level. It is crucial that EU companies are not disadvantaged compared to third-country companies, which operate on the EU market.

The EU's exclusive competence in the field of competition policy allows the European Commission, primarily DG Competition, to monitor the European market to avoid market distortions and to control the use of state aid by national public authorities. State aid can take various forms such as subsidies, tax reductions, privileged access to public tenders, or trade protection. This instrument is defined as "*...any aid granted by a Member State or through State resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods...*"⁵².

In order to abide by EU law, Member States have to notify the grant of state aid to the European Commission so that the latter can carry out an *ex-ante* assessment (triggering a preliminary investigation) before the money is granted to beneficiaries. However, some flexibility exists⁵³ and there are some exceptions to mandatory notification⁵⁴. Furthermore, exemptions and aid thresholds were revised by the modernisation of state aid rules initiated by the Commission in 2014. As a result,

⁵² Art. 107 Treaty on the Functioning of the European Union (TFUE).

⁵³ For instance, if the amount does not exceed a minimal threshold, it is not considered as aid.

⁵⁴ Those exceptions concern aid covered by a Block Exemption; an aid not exceeding €200,000 per undertaking over any period of 3 fiscal years (€100,000 in the road transport sector); or aid granted under an aid scheme already authorised by the Commission.

new forms of exempted aid have been allowed⁵⁵ and notification thresholds have been raised for several categories in view to lowering administrative burden and speeding up the access to aid. Nevertheless, all these changes do not prevent the Commission from conducting an evaluation, should it consider that the required conditions are not met.

Competition law represents a major, if not the main, pillar of EU industrial policy. The EU has historically placed significant emphasis on respecting market forces and considered that perfectly competitive markets do not necessitate governmental intervention unless market failures incur. This view is supported by the argument that state intervention is difficult to justify, in light of government failures, and does not fully address market or systems failure⁵⁶. Opponents of state interventions therefore stress that governments' decisions to support companies lack an evidence-base, can be motivated by vested interest and do not take market considerations into account⁵⁷ given the undue influence interest groups can exert on the political system. Past experiences showed that governments might pick the 'wrong winners' (for instance declining industries with low or negative investment returns) and favour rent-seeking (the process in which certain companies receive subsidies or other forms of aid, without creating any benefit for the society). But do the risks associated with public intervention justify a *laissez-faire* attitude?

This paper argues that this is not the right policy answer, as recent economic developments have revealed the risks involved in *laissez-faire* policies. In this regard, the financial crisis highlighted deep sectoral imbalance in some countries, not least the excessive development of non-tradable sectors at the expense of tradable ones, which are more conducive to sustainable growth⁵⁸. The Spanish housing bubble and consequent crisis in the financial sector is a case in point. In addition, many countries preferred and/or happened to specialise in upstream R&D as well as services without paying attention to the positive externalities of manufacturing production⁵⁹. As indicated in chapter 2, such a strategic choice involves significant risks for economic sustainability, resulting in a loss of future skills, R&D investments and in turn, jobs.

Moreover, it should be recognised that proponents of *laissez-faire* policies neglect part of the equation. First, other countries both in developed and emerging economies⁶⁰ are active practitioners of public interventions adding further pressure on European industry. For instance, the US has recently launched a very ambitious manufacturing strategy with streamlined investment in industrial technology commercialisation projects⁶¹. Second, public support for industry, if well governed, can have positive externalities. Among them, well-designed aid can:

- generate knowledge spill-overs across sectors and companies;

⁵⁵ As stated by European Commission (2014), "Declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty", Regulation (2014)651, Art.1, the exempted categories of aid are: regional aid; aid to SMEs in the form of investment aid, operating aid and SMEs' access to finance; aid for environmental protection; aid for research and development and innovation; training aid; recruitment and employment aid for disadvantaged workers and workers with disabilities; aid to make good the damage caused by certain natural disasters; social aid for transport for residents of remote regions; aid for broadband infrastructures; aid for culture and heritage conservation; aid for sport and multifunctional recreational infrastructures; and aid for local infrastructures.

⁵⁶ Warwick, K. (2013), *op. cit.*

⁵⁷ *Ibid.*

⁵⁸ Aghion P., Boulanger J., Cohen E. (2011), *op. cit.*

⁵⁹ *Ibid.*

⁶⁰ See: "The long arm of the state", *The Economist*, 23 June 2011, available at: <http://www.economist.com/node/18832034>, last accessed on: 31 October 2014.

⁶¹ For instance, US public investment has exceeded \$7 billion over the past two years. In addition, the two largest car manufacturers in the US were bailed out by the federal government in 2008 and 2009. See: Pollin R. (2010), "Industrial Policy and the Revival of the U.S. Economy", *Commentary*, Political Economy Research Institute, Massachusetts Amherst, U.S., January.

- favour the creation of start-ups by addressing credit constraints and provide the necessary capital;
 - encourage incumbents to become more innovative and thus more productive; and
 - incentivise industry to address societal challenges like resource scarcity and high CO2 emissions.
- Studies have shown that innovation is highly path-dependent as any change in strategic policy direction involves economic costs. Therefore, moving away from path-dependency requires support. The most illustrative example is clean technologies as studies have proven that in the absence of direct clean innovation subsidies, companies with previous investments in dirty innovation pursue the same path.

With all these possible benefits in mind, the question should no longer focus on whether public authorities need to become more active in industrial policy. Instead, discussions should concentrate on how government interventions can be better targeted and how its positive impact on the economy as a whole can be maximised⁶².

Many scholars have looked into the question and have pointed to two convincing conclusions⁶³. First, state aid rules need to adopt a sectoral approach instead of supporting a particular firm. While being distributed evenly within the sector, state aid can induce innovation and productivity growth as they encourage all firms operating in the same sector. Therefore, having a coherent sectoral strategy across Europe would be very promising.

Second, the positive effects of public interventions are more significant in competitive sectors. Regression exercises⁶⁴ have demonstrated that productivity growth, as well as product innovation, are positively correlated with state aid in competitive sectors, whereas the effects are negative for non-competitive sectors.

All in all, evidence shows that competition and state aid policies should be designed to support industrial policy. Indeed, public support can become, if well targeted and governed, a driver for increased competitiveness. In this regard, the recent EU state aid reform and the exemption of new categories of aid are welcomed initiatives. Yet, the European Commission's attitude still remains defensive and European and national authorities continue to perceive each other as entities pursuing conflicting goals⁶⁵.

Policy recommendations

Maximising the positive impact of competition policy on industry's competitiveness

- A more proactive approach is needed to reconcile industrial and competition policy and the objectives pursued by European and national authorities. To this end, state aid should be distributed on the basis of economic (instead of purely legalistic) criteria, targeted to competitive sectors in order to maximise the positive effects on innovation and productivity.

⁶² Aghion P., Dewatripont M., Du L., Harrison A. and Legros P. (2010), "Industrial policy and competition", *Harvard Working Paper*, Cambridge, U.S., April.

⁶³ See: Aghion P., Boulanger J., Cohen E. (2011), *op. cit.*

⁶⁴ *Ibid.*

⁶⁵ Recent disputes between the French government and EU Commissioner Almunia were a case in point. See the exchange of letters between Mr. Montebourg and Mr. Almunia: "War is declared between Montebourg and Almunia", Euractiv, 27 January 2014, available at: www.euractiv.com/trade/war-french-minister-eu-competiti-news-533012, last accessed on: 30 October 2014.

- Government support to industries should result from a sound economic analysis assessing the viability of the firm. Furthermore, some forms of conditionality not only in relation to jobs creation but also to good management and innovation should be introduced.
- A faster decision-making process and streamlined procedures are required in state aid cases. The lengthy and cumbersome process generates costs for companies.

Bringing coherence to EU innovation and competition policies

- Establishing a coherent strategy towards promising technologies is required at EU level. The EU needs to further adapt its competition policy and to reconcile it with its innovation strategy focusing on specific technologies, in particular the ones, which have been subject to priority action lines as highlighted in the 2010 Commission's communication⁶⁶. To this end, the current thresholds for project notifications in the Block Exemption rules should be increased, especially for experimental development and industrial research to €20 million.

Creating a global level-playing field for European industries

- EU authorities should ensure that European and non-European companies face the same rules and get the same chance to succeed. To achieve this objective, provisions preventing subsidies and preferential measures as well as the use of reciprocity principles when giving access to public procurement procedures to third-country companies should be included in all EU trade agreements.

4.1.4 Facilitating access to finance across the whole EU

One of the most serious consequences of the economic and financial crisis is the limited access to finance for European companies, which hampers their capacity to invest, innovate and grow. The recession, the bleak economic outlook and banks' impaired balance sheets have all led to a reduction of funding especially for SMEs⁶⁷, which are commonly considered as the backbone of EU's economy. Indeed the 20 million SMEs existing in Europe represent 99.8% of all non-financial companies, employ 86.6 million people and generate 57.7% of total EU value added⁶⁸.

While the overall access to finance for SMEs in Europe has been improving since 2013, the recovery is uneven (see Figure 13). Companies still encounter significant difficulties in some countries, in particular in the south where the crisis has hit the hardest⁶⁹. Half of SMEs in Italy and Spain reported in 2013 that the lack of access to finance was a very serious concern for their business⁷⁰.

⁶⁶ European Commission (2010), "An Integrated Industrial Policy for the Globalisation Era - Putting Competitiveness and Sustainability at Centre Stage", COM (2010)614.

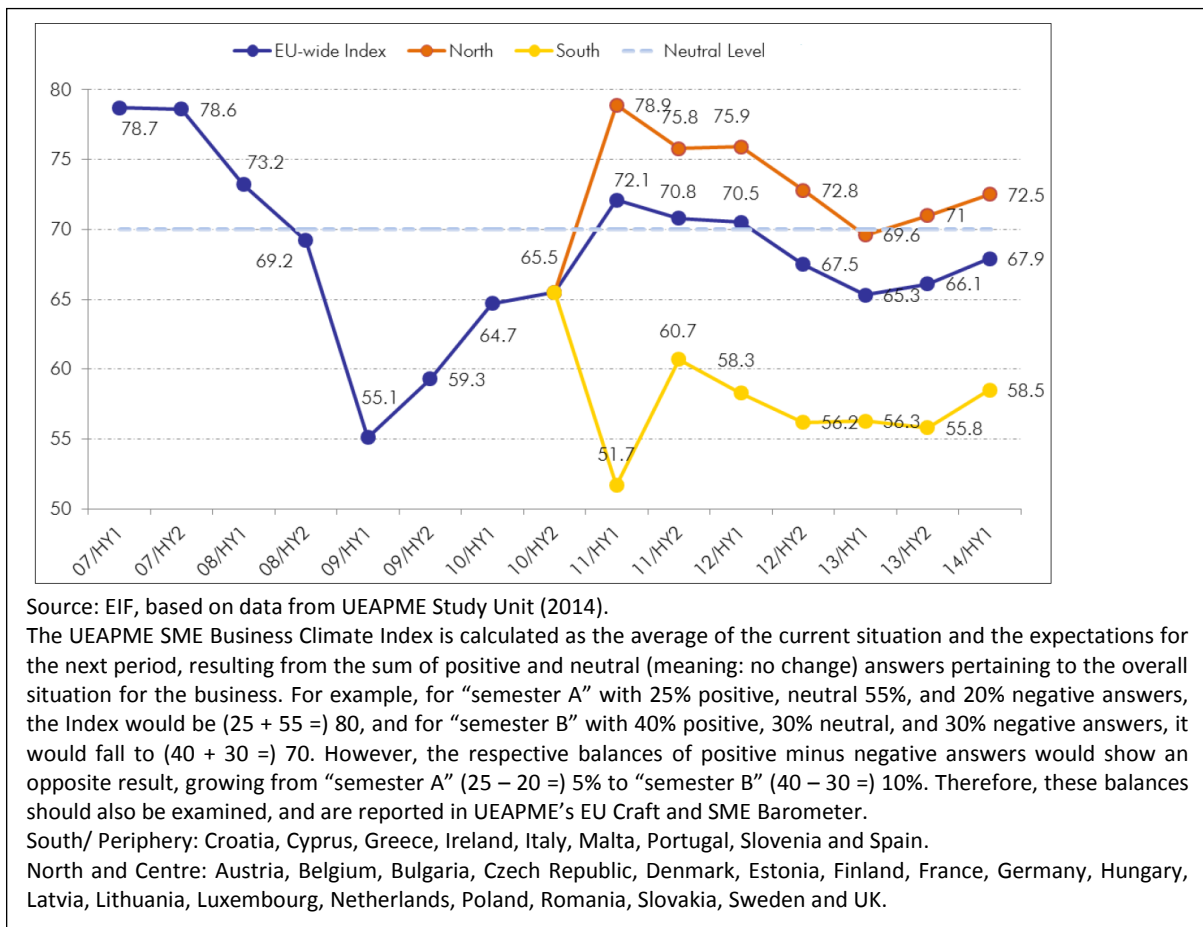
⁶⁷ SMEs are defined by the European Commission as companies having fewer than 250 employees and an annual turnover not exceeding EUR 50 million; see: Art. 2, European Commission (2003), "Concerning the definition of micro, small and medium-sized enterprises", Recommendation (2003)361.

⁶⁸ Kraemer-Eis H., Lang F., Gvetadze S. (2014), "European Business Finance Outlook", European Investment Fund, *Working Paper, no. 24*, Luxembourg; Pelly R., Kraemer-Eis H. (2012), "Improving the funding landscape for entrepreneurs", in "SMEs in the Single Market A growth agenda for the 21st century", *Lisbon Council, Policy Brief Vol. VI*, No. 3, p.12-15, Brussels.

⁶⁹ Kraemer-Eis H., Lang F., Gvetadze S. (2014), *op. cit.*; Darvas Z. (2013), "Banking system soundness is the key to more SME financing", *Bruegel Policy Contribution, Issue no. 10*, Brussels; ADB, OECD (2014), "Study on Enhancing Financial Accessibility for SMEs, Lessons from recent Crises", Asian Development Bank, Manila, Philippines.

⁷⁰ European Parliament (2014), "How can European industry contribute to growth and foster European competitiveness, *Study for the ITRE Committee*, August.

Figure 13: SME Business Climate Index



What are the reasons which underpin the situation described in Figure 13? Two major reasons can be identified. The first, which is more of a general nature, is that SMEs lack alternatives to debt financing and rely highly on domestic bank funding. In the event of a banking and financial crisis, venture capital availability as well as bank lending capacity are reduced. As a consequence, banks prefer to lend money to companies, which can demonstrate a good credit record and can present collaterals. SMEs are therefore more affected, in terms of access to credit, than large corporates, which benefit from easier credit conditions and have more experience in accessing finance outside the domestic market. Micro and young enterprises face even greater challenges as European banks are generally reluctant to invest if they perceive the risks as too high and the return on investment as too slow and/or uncertain. This is a direct consequence of financial market imperfections. This also illustrates the asymmetry of information between lenders and borrowers⁷¹ and the reluctance of lenders to take risks, which result in a fragmentation of the internal market and constitute a significant barrier to innovation and growth for the entire economy.

The second reason, which concerns the uneven recovery, is that SMEs across Europe face different conditions. On the one hand, the cost of loans and restrictions regarding access to loans vary significantly between Member States⁷². On the other hand, the existing asymmetry of information prevents lenders from getting the right information about the profitability of an investment. As a result, they base their decisions on collateral and track record instead of the economic viability of the project.

⁷² European Commission (2013), “2013 SME’s Access to Finance Survey, Analytical Report”.

The lack of information on the side of borrowers about the range of investment options also plays a role in this process. Thus, many SMEs see their demand for external funding refused or do not even apply for external finance because of a lack of information⁷³.

While economic recovery and the consolidation of banks' balance sheets, as well as the Banking Union, should restore pre-crisis levels of funding in the long term⁷⁴, the intervention of government agencies and EU institutions is essential to limit the damages of the crisis in the short term, supporting the market in a counter-cyclical way.

At EU level, the European Investment Fund (EIF), funded by the European Investment Bank (EIB), the European Commission and some European banks and financial institutions, is the largest investor in venture and growth capital funds, the major SME guarantor and the leading source of funding for microfinance in Europe. Working in partnership with banks, guarantee institutions and venture capital funds, the EIF provides different kinds of innovative financial instruments⁷⁵. These instruments cover various types of SMEs and make interventions in different phases of development possible.

Venture capital funds were created with the objective of providing equity capital and promoting cooperation between corporate investors, fund managers and companies. The development of the European private equity market⁷⁶ is quite recent compared to the US and, despite a rather positive trend in terms of amounts invested in the latest period⁷⁷, the use of this instrument is still relatively limited⁷⁸. Its potential to collect the necessary capital to create a new company or restructure an existing one, is, however, very high.

Furthermore, microcredit⁷⁹ aims at providing smaller amounts of money to entrepreneurs. Traditionally considered as a loan with social objectives, this instrument is also a powerful tool for the creation of new micro SMEs and the emergence of new actors in the manufacturing sector. The EIF and the European Commission have created a dedicated fund⁸⁰ which provides resources to microfinance intermediaries. However, the level of development of this market is also limited⁸¹.

Regarding debt financing, different schemes have been put in place by the EIF. The most common are loan guarantee schemes, which address the lack of collateral and therefore enable the lender to finance SMEs. Initiatives of this kind exist also at national level.

⁷³ European Commission (2013), "European Competitiveness Report 2013, towards knowledge-driven reindustrialization", European Commission Staff working document no. 347.

⁷⁴ Darvas Z. (2013), *op. cit.*

⁷⁵ The term could create some confusion, since some of these instruments have been already known and used in some countries for some time. The most suitable term is 'blending instruments' or 'debt and equity instruments'. More information can be found in: Nunez Ferrer J., Volkery A., Withana S., et al. (2012), "The use of innovative financial instruments for financing, EU policies and objectives implications for EU and national budgets", *CEPS Special Report, No. 68*, Brussels.

⁷⁶ Different forms of equity capital can be identified, some examples are: venture capital, private equity fundraising, technology transfer, mezzanine finance, public private partnerships. More information is available in Kraemer-Eis H., Lang F., Gvetadze S., (2014), *op. cit.*

⁷⁷ Kraemer-Eis H., Lang F., Gvetadze S., (2014), *op. cit.*

⁷⁸ The total private equity investment in Europe in 2013 was 0.27 % of GDP. See: ECVA, "2013 European Private Equity Activity, Statistics on Fundraising, Investments & Divestments", *ECVA Report*, May, Brussels.

⁷⁹ Defined at EU level as loans or lease under EUR 25000, with the objective to support the development of self-employed and micro enterprises; European Commission (2007), "A European initiative for the development of micro-credit in support of growth and employment", COM (2007)708.

⁸⁰ This Fund is called the European Progress Microfinance Facility, more information can be found at: http://www.eif.org/what_we_do/microfinance/progress/, last accessed on: 10 November 2014.

⁸¹ Studies estimate a potential demand for microcredit of EUR 8.66bn in the EU; despite the lack of accurate data, a substantial portion of this demand is considered as referred to microenterprises; see: Kraemer-Eis H., Lang F., Gvetadze S., (2014), *op. cit.*

While these initiatives are important to boost access to finance for SMEs, their outreach is quite limited compared to the total number of existing SMEs of which around 230.000 were supported, directly or indirectly, by the EIF in 2013⁸². This suggests that the priority must be to restore the normal functioning of banks, which are the main institutions involved in SMEs financing⁸³. The first European Central Bank (ECB) allotment of Targeted Long Term Refinancing Operations (TLTROs), set up in September 2014, goes in the right direction. The €82.6 billion allocated are indeed provided to banks on the condition that the amounts are lent to the real economy, and in particular to the non-financial sector⁸⁴. Whether these measures can ensure that new liquidity is actually channelled to finance SMEs and innovative companies remains to be seen.

In addition to EIF existing instruments, securitisation of SME loans⁸⁵ have been suggested at EU level as a good option for providing liquidity to banks⁸⁶. The EIB, together with some national governments⁸⁷, have been active in improving the transparency of this instrument and in supporting the revival of the market. The ECB asset-backed securities purchase programme (ABSPP) and covered bond purchase programme (CBPP3), announced in October 2014, are therefore welcome steps towards a further increase in the liquidity levels and, hopefully, in banks' lending capacity⁸⁸.

⁸² European Investment Fund (2013), "SME Report 2013".

⁸³ Some experts suggested that the resistance of banks to lend to the private sector could be tackled through providing liquidity at the condition that lending to private non-financial corporation is increased; in Z. Darvas (2013), *op. cit.*;

⁸⁴ See: ECB PRESS RELEASE (2014), 5 June, *ECB announces monetary policy measures to enhance the functioning of the monetary policy transmission mechanism*, http://www.ecb.europa.eu/press/pr/date/2014/html/pr140605_2.en.html; ECB PRESS RELEASE (2014), 18 September - *ECB allots €82.6 billion in first targeted longer-term refinancing operation*, http://www.ecb.europa.eu/press/pr/date/2014/html/pr140918_1.en.html, both last accessed on: 4 November 2014.

⁸⁵ Different forms of securitisation are available to banks, with different purposes: keeping the securitised loans and use them as collateral with the central bank; sell them to private parties, or sell them to the central bank. For more information on this, see Z. Darvas (2013), *op. cit.*

⁸⁶ Since the beginning of the decade securitisation has gradually increased in Europe, the levels remaining high even during the crisis. However, since 2008 securitisation was mainly used for obtaining liquidity for the central banks. The trend has then inverted, and it is still negative, the retention rates are also on a downward trend; in Kraemer-Eis H., Lang F., Gvetadze S. (2014), *op. cit.*

⁸⁷ Kraemer-Eis H., Passaris G., Tappi A. (2013), "SME Loan securitisation 2.0, Market assessment and policy options", European Investment Fund, *Working Paper No. 19*; Online article from Euractiv, available at: <http://www.euractiv.fr/sections/euro-finances/le-gouvernement-francais-veut-soutenir-la-titrisation-308467>, last accessed on: 10 November 2014.

⁸⁸ See: ECB PRESS RELEASE (2014), 2 October. ECB announces operational details of asset-backed securities and covered bond purchase programmes, available at: http://www.ecb.europa.eu/press/pr/date/2014/html/pr141002_1.en.html, last accessed on 29 October 2014.

Policy recommendations

Addressing information asymmetry

- Addressing information asymmetry on the side of lenders and borrowers could help cut capital costs and increase lending. On the one hand, empowering banks with the necessary skills for evaluating lending applications from new SMEs and a standardisation of financial information could help them evaluate the risk of lending. On the other hand, raising the awareness of SMEs concerning the different sources of funds available and training entrepreneurs on how to prepare lending applications are needed.

Strengthening the EU's role in restoring normal lending conditions

- While a correct implementation of the Banking Union could help restore the pre-crisis level of funding in the long term, a more targeted action in crisis countries could be envisaged in the short term. The creation of a European Investment Guarantee Scheme⁸⁹ could facilitate funding for companies in crisis countries, while at the same time creating investment opportunities to economically stronger countries.

Developing a large range of financial tools and facilitating combined financing

- Further encouragement of developing non-bank financial institutions which can provide alternative forms of funding is necessary, in particular by:
 - facilitating the development of private equity firms and funds through the improvement of EU regulatory framework;
 - ensuring a stronger support to the development of microfinance and microfinance institutions (MFIs) both at EU and the national level. An increased level of coordination and guidance should be provided by EU institutions, in order to put in place a common regulatory framework for MFIs and to ensure the development of stable funding patterns.

The catalyst role played by the EIF in this regard should be strengthened through increased levels of funding as this could in turn increasingly attract new private capital and financial investors.

⁸⁹ See: Zuleeg F. (2013), "Squaring the circle – A European Investment Guarantee Scheme (EIGS)", *EPC Commentary*, Brussels.

4.2 IMPLEMENTING THE TWO GUIDING PRINCIPLES OF THE NEW STRATEGIC VISION

4.2.1 *Towards a more collaborative approach*

4.2.1.1 Building up a complete industrial eco-system⁹⁰

Some European regions host world-leading examples of industries specialising in high value-added and knowledge-rich products which are sold across the globe. Two strategies lie at the heart of the successful economic development of these regions and have enabled them to build up a complete industrial eco-system: specialisation and clustering.

These regions generally specialise in the production of complex durable goods (such as cars, aircrafts or production machinery) thanks to industries with complementary capabilities which are located near each other to create a complete industrial ecosystem. Specialisation therefore takes place within a complex web of relationships in which production tools, parts and components are exchanged between hundreds of suppliers, sub-contractors and original equipment manufacturers to be integrated with the help of highly skilled workers and sophisticated production systems.

The economic theory on industrial agglomeration suggests that firms tend to cluster near each other in order to reduce transport costs, namely the costs of moving goods, people and ideas. Geographical concentration helps manufacturing to reduce shipment costs between suppliers and customers. Ideally, they are also concentrated close to where demand is so that they can build up services around their products. Moreover, firms benefit from the flow of skilled workers and ideas (the so-called knowledge spill overs) across firms and industries. In today's globalised world where the costs of transporting goods, people and ideas have drastically decreased, the importance of geographical concentration has, however, not disappeared.

This is valid especially for industries in which a dialogue between actors in the value chain is important for quality production and innovation. For instance, the task of production technology firms within the mechanical engineering industry is to develop sophisticated production solutions and equipment for client industries' production processes. To this end, a close interaction between customers and suppliers is needed to understand customers' production needs, to meet very stringent technical requirements for their processes and to provide value added services for maintenance, system reconfiguration or upgrades in a timely manner. As highlighted in box 4, several regions have succeeded to build fruitful relationship between the mechanical engineering industry and downriver industries such as automotive or aerospace.

⁹⁰ The major part of this section was written by Gokalp Gumusdere, European Policy Advisor at CECIMO.

Box 4 | A robust eco-system –A key driver for machine tool industry’s competitiveness

A majority of machine tool companies in Europe are small and medium sized. Despite their limited size - which is a typical pattern in the European mechanical engineering industry - they are extremely successful in international markets. More than 40 % of European machine tools production is exported outside the EU. European machine tool companies generate 39% of the world machine tool output and European exports (including intra-EU trade) equals to half of the global machine tool exports.

A good example of this success is the *Baden Württemberg* region in Germany. In this region one finds some great brands in the car industry such as Audi, Mercedes Benz, Porsche side-by-side with key suppliers of parts and components: Behr, Bosch, Eberspächer, Knecht, Mahle, ZF Friedrichshafen AG. Moreover, some of the finest machine tool companies and tool makers in the world, which provide production equipment and technology for metal working, are located here, such as Trumpf, Walter, EMAG, Schüler. The concentration of manufacturing companies, component suppliers, customers and research and training institutes has turned Baden-Württemberg into a high-tech hub. As a result, the *Baden Württemberg* region, which is Germany’s autoland and the cradle of medical technology, generates 53.7% of the total machine tool output in Germany and a quarter of the total European output. More than two fifth of German machine tool companies are located there.

It is possible to see similar agglomerations in the region of *Upper Austria* or *Piemonte* in Italy but also in the *Nagoya* region in Japan or the Mid-West manufacturing belt in the US. All these examples are heavily industrialised regions specialising in advanced manufacturing and in the production of high value-added goods, which help them to position themselves as some of the finest export basis in the world. The co-existence of precision tools and machines underpins the global success of strategic industries in these regions such as automotive, medical technology and aerospace.

Author: Gokalp Gumusdere, European Policy Advisor, CECIMO

Source: CECIMO website, available at <http://www.cecimo.eu/site/>, last accessed on: 30 October 2014.

Yet, globalisation and the rise of emerging economies have come to undermine the key components of industrial eco-systems in some European regions. Attracted by public investment, an innovative-friendly environment and booming market demand, some major European industries have relocated to emerging economies, in particular Asia, over the last decades. These economies have invested substantial resources to build strong innovation hubs to attract foreign investment⁹¹, which could ultimately contribute to the development of their local industry. As a result, European original equipment manufacturers, who shifted their production outside Europe, were sometimes followed by their large suppliers. This has created large deficits in the European industrial eco-system. Moreover, equipment manufacturers fear that better opportunities to exploit scale effects in emerging markets could induce key European component suppliers to dismantle capacities in the EU, endangering strategic upstream linkages⁹².

In order to tackle these new challenges and to repair the holes in their industrial eco-systems, Europe has to invent new models of innovation and technology partnerships. Clusters remain the adequate response to this challenge. However, it goes without saying that industry clusters cannot be created from nothing or parachuted into economies. As research has shown, their emergence and success require a balanced interaction of four determinants of competitive advantage: demand conditions (i.e. market demand), input (or factor) conditions, presence of supporting industries and company rivalry (or competition)⁹³.

⁹¹ Roland Berger Strategy Consultants (2012), “Innovation - How the emerging markets are driving the global innovation agenda”, Global Topic Initiative, Munich.

⁹² Vieweg H. G. (2012), “An introduction to mechanical engineering: Study on the competitiveness of the EU mechanical engineering industry”, Within the framework contract of sectoral competitiveness studies-ENTR/06/054, *Final report*, Munich.

⁹³ Zadeh R. M. (2007), “Cluster Development and Initiatives in Traditional Industries”, *Paper for International Cluster Conference: Patterns of Clusters Evolution*, Yorkshire Forward, Brussels; see also Porter M. (1990), “The competitive advantage of nations”, Harvard Business Review, Cambridge, U.S., March/April.

This section has highlighted the importance of market demand for a firm's products and services (demand conditions) and of the presence of locally based suppliers to build up a solid industrial ecosystem. Other sections of the paper have emphasised the role of competition (or rivalry) between companies to foster productivity and innovation. This principle also applies to clusters. Along with collaboration between companies, it is indeed the degree of competition, which determines the cluster's overall performance. In addition, other sections have also highlighted the need for providing companies with the right input or factor conditions, through for instance better regulation and investment in human capital.

In view to complete the industrial eco-system, there is another determining element, which forms an integral part of the input conditions. It is the co-location of technology and research centres. Such centres can play a catalytic role in boosting the innovation and economic development potential of a cluster. They might stimulate collaborative relations between industry and universities, and thus help bridge research, i.e. the generation of knowledge, with the market. Today, new waves of disruptive technologies, such as additive manufacturing, i.e. the process of making objects from 3D model data by joining materials layer by layer, and industry 4.0⁹⁴, are in the pipeline. In order to integrate these technologies into products in a timely manner and to accelerate their commercialisation process, manufacturing industry needs to work together with research and technology institutes. Such collaboration is essential to cover the three stages of the innovation chain, i.e. technological research, product development and demonstration activities.

In a nutshell, clusters enable all agents of the innovation chain to pull their resources and skills together, thus reducing the costs of innovation and connecting them to a vast pool of know-how and capabilities. Lastly, clusters help raise the image of regions internationally and contribute to attracting new companies and capabilities.

Policy recommendations

Enabling a dynamic flow of information within the innovation chain

- Universities and research centres should be encouraged to collaborate more intensively with the business sector. More conditionality with regard to public-private cooperation in the distribution of public subsidies given to universities could be part of the solution.

Making the presence of cluster a key criterion in the distribution of public money

- In order to maximise the impact of EU funds on Europe's competitiveness, their allocation to industry should take into account the presence of clusters. By the same token, it should become one of the key criteria in the distribution of state aids.

Reinforcing the role of regional authorities in the identification and building-up of clusters

- Regional authorities and regional development agencies are best placed to investigate, in consultation with industry stakeholders, existing clusters and potential new ones. In addition,

⁹⁴ Industry 4.0 is presented in the literature as the fourth industrial revolution. It aims to computerise manufacturing and to create digitalisation links in all productive units. In industry 4.0, IT systems will be far more connected to all sub-systems, processes, internal and external objects, the supplier and customer networks. For more information on industry 4.0, see, Roland Berger Strategy Consultants (2012), *op. cit.*

their role is key to analyse the needs of the cluster and to identify the possible missing links of the eco-system as well as the possible areas of market failures. To this end, more research at the regional level needs to be carried out in view to analysing how to strengthen the four determinants of competitive advantage mentioned above.

4.2.1.2 Turning the smart specialisation concept into reality

The best placed instrument for the development of EU industrial eco-systems and the achievement of their full potential is smart specialisation.

This concept, introduced within the EU 2020 Agenda⁹⁵, builds on the idea that the concentration of public resources on particular economic activities can strengthen the existing comparative advantage of European regions and boost economic growth. Smart specialisation is defined by the European Commission as *“the national or regional innovation strategies which set priorities in order to build competitive advantage by developing and matching research and innovation own strengths to business needs in order to address emerging opportunities and market developments in a coherent manner, while avoiding duplication and fragmentation of efforts; a smart specialisation strategy may take the form of, or be included in, a national or regional research and innovation (R&I) strategic policy framework”*⁹⁶. The logic here is that regions cannot do everything, that public investment spread too thinly is inefficient and that *“they need to promote what should make their knowledge base unique and superior to others”*⁹⁷. In the context of EU cohesion policy 2014-2020, EU Member States and regions have been asked to draw-up smart specialisation strategies and to concentrate EU funding on some thematic priorities.

Smart specialisation is a bottom-up approach, in which regional authorities play a key role in identifying domains of present or future comparative advantages. This is a challenging task, which requires the capacity to collect and analyse an important flow of information. Market opportunities need to be rightly identified and enabling a constant flow of information between knowledge generation and the market is key. To this end, it is important that entrepreneurs, innovators, research and technological centres as well as public institutions work together. In addition, a certain degree of flexibility is required so that specialisation priorities can adapt to the fast changing environment and to the needs of the market.

If well coordinated and implemented across the whole EU territory, the smart specialisation approach can lead to very successful results. First, it can activate a process of entrepreneurial discovery at the regional level, helping regional authorities to take stock of their industry’s strengths and weaknesses. Second, smart specialisation can foster inter-regional learning and cooperation. As indicated in box 5, several EU regions have already applied the concept and are looking to develop it further. Third, this tool is very promising for facilitating the emergence of the Europeanisation of manufacturing value chains (see next section on ‘Europeanisation of the value chain’) and avoiding over-production like what is currently occurring in the car industry sector.

⁹⁵ European Commission (2010), “Regional Policy contributing to smart growth in Europe 2020”, COM (2010) 553 final.

⁹⁶ See: Art.3 from European Parliament and Council (2013), “Laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund and repealing Council Regulation (2006)1083”, Regulation (2013)1303.

⁹⁷ OECD (2013), “Innovation-driven Growth in Regions: The Role of Smart Specialisation”, *OECD Publications*, Paris, p.28.

Box 5 | The industry-led interregional cooperation in Scotland

What will drive more impact to help meet our goals of smart, sustainable and inclusive growth? Is more; less; or different EU level intervention required to develop a new EU industrial policy? From our point of view the answer is most probably, more and different.

Scottish Enterprise is Scotland's enterprise, innovation, investment and internationalisation agency. We are funded by and work closely with Scottish Government to deliver sustainable growth through the Government Economic Strategy, prioritising our contribution to support Scotland's growth companies and sectors where we can create the greatest impact.

Our key sectors approach in Scotland is based on understanding established strengths and assets, industry leadership and strong growth ambitions, which are delivered in a collaborative way – through our 'Team Scotland' approach - addressing our ambitions to improve Scotland's competitiveness, specifically innovation and internationalisation performance.

Through engagement in the EU Smart Specialisation agenda we have developed greater focus on identifying the 'niche' elements of our strengths and where cross-sectoral opportunities exist with strong market demand/potential. We have derived significant benefit from this activity, not least in encouraging greater prioritisation and focus and driving a greater 'external' perspective in our innovation priorities.

We believe there is more work to be done in ensuring the Smart Specialisation agenda is more visible in wider EU Industrial Policy discussions, not least in the catalytic role it can play in encouraging industry-led and priority-driven growth.

This is not without its challenges – many of which are known to all of us given the economic context in which we operate: the structure of our economy (with limited industrial-driven growth); generally slow growth; challenging investment environment/access to finance; and particularly for Scotland, under-performance in innovation and internationalisation. Our role in, and impact on, supporting EU growth is highly connected to our partners across the EU – partners of choice to collaborate with around common growth ambitions, facing similar economic and scale challenges in delivering growth. Inter-regional collaboration is helping us to better understand our domestic assets and how we can maximise them for our own and broader EU benefit. This not only helps deliver the Smart Specialisation agenda but is critical to delivering an industrial policy for the EU fit for our current and future purpose.

What does inter-regional collaboration in the context of an industrial renaissance for Europe look like? The Vanguard Initiative, of which we are a member, is one such example – and can make a unique contribution to addressing the above challenge. 'The Vanguard Initiative for New Growth through Smart Specialisation' is a politically-driven network (currently 19 regions but growing) set-up in November 2013. The Vanguard Initiative is committed to inter-regional, growth-driven collaboration to support EU economic growth ambitions.

These regions seek to develop greater capacity for international competitiveness by 'joining forces' to align our strengths and combine our assets. We are exploring how we build and strengthen EU value chains to boost our respective and collective international performance. We believe this is critical to supporting European industries. For this reason, the Vanguard Initiative has been asked to work closely with Commission services to explore how this type of collaboration can support the EU's growth agenda and the development of EU industrial policy. This is not a simple 'ask' or an easy task to deliver – there are no obvious means of achieving this and the 'good practice guide' simply does not yet exist. However, the Vanguard Initiative's early work is uncovering what we believe to be a range of market and systemic failures which make it difficult for companies to 'find each other' across borders and across the EU. This knowledge is extremely useful when considering how to support European industries.

The Vanguard Initiative is committed to making this process easier for EU industry (especially our SMEs) by working with EU and domestic level policy makers to re-shape policy and facilitate this type of industry engagement. We are working directly with industry partners on pilot actions to demonstrate how this can be done. We are experiencing that industry-led inter-regional collaboration, based on clearer understanding of regional assets, can lead to new opportunities.

Now is the time to identify what further support in the shape of coordinated EU policy and actions – across Industrial Policy, Regional Policy, Smart Specialisation, Research and Innovation and EU Clusters Policy – is needed to facilitate stronger collaboration and engagement of European industries.

Growth-oriented policies – especially at EU level – need to be better connected to make the kind of impact required for a radical shift in how EU industry works together.

What is the strategic role the EU can play in this process? There is a clear need for a strong policy framework which encourages the breaking down of barriers to effective cross-EU collaborations and the mobilising of regional assets and resources to achieve 'critical mass', which can encourage industry-driven growth in areas where the EU has competitive advantage. This will be key to Europe's future success in achieving our jobs and growth ambitions and boosting EU industry's position in the international marketplace.

Authors: Sarah English and Alison Hunter, Scotland Europa; and Linda Hanna, Senior Director of Strategy & Economics, Scottish Enterprise.

As mentioned above, the concept of smart specialisation supposes the existence of good coordination and communication capabilities in the regions and the ability to identify where the comparative advantage lies or could be created, which is not evident for every region in the EU. A guiding role needs to be played at national and EU level, in order to enable all regions to exploit this instrument.

Policy recommendations

Reinforcing the EU's role to make it happen

Europe cannot afford to wait for EU regions to take ownership of the smart specialisation concept. The EU needs to build on previous and on-going initiatives to make sure that the process does not lose momentum. To achieve this objective, the EU needs to:

- support initiatives aiming to provide a better understanding of regional manufacturing capacities and of the composition of value chains in Europe;
- provide a good governance model facilitating inter-regional cooperation and helping regions, in particular the ones with less capacity, to identify and/or build up their comparative advantage;
- make sure that EU funding and the priorities of EU regional policy are aligned with the priority action lines identified for manufacturing at EU level.

Ensuring flexibility and adaptability to the market

- Smart specialisation should be a dynamic process based on industrial clusters. Fostering competition within regional territories is key to make sure that smart specialisation leads to excellence.
- In order to allow a constant flow of information from knowledge generation to the market, public authorities should establish operational units composed of the main agents of the 'innovation chain' as well as representatives of public institutions. However, the composition of these units should not be rigid so that rent-seeking behaviour is avoided.

Balancing out manufacturing specialisation and diversification across the EU

- The EU governance level should allow robust monitoring of the smart specialisation process across Europe and give a close look at whether there is not too much of duplication in regional specialisations.
- The smart specialisation approach should make sure that the three stage of the 'innovation chain' are covered and balanced out.

4.2.1.3 Facilitating the Europeanisation of the value chain

The international fragmentation of production in global value chain (GVC) is the major element shaping the new environment in which European industry operates today. As defined by the OECD, a value chain is *"the full range of activities that firms engage in to bring a product to the market, from*

*conception to final use. Such activities range from design, production, marketing, logistics and distribution to support to the final customer*⁹⁸. Every activity embodied in the production of a good generates a certain value added and the position of a country in the GVC determines to what extent it benefits from it. The structure of the value chain and the value of each production stage may vary from one product to another but generally speaking, upstream activities such as R&D and design as well as downstream activities such as branding and marketing create more value added than assembly.

Nowadays, a product is no longer created by a single firm in one location. Progress in information and communication technologies, the increased digitalisation of our economies, trade liberalisation, and cheaper transport costs have enabled companies to slice up production into separable stages and to look for the best suited location for each of them. Thus, many European manufacturing firms have broken up their value chain and outsourced parts of it to external companies located either inside or outside Europe. As a result, the production of a good involves a growing number of intermediate firms and value chains have internationalised and become increasingly complex.

The growing fragmentation of manufacturing activities has raised significant opportunities for European firms, contrary to what is usually assumed. Firm-level analysis has shown that firms, which are integrated in GVCs, either through offshoring or outsourcing⁹⁹ activities, importing components or exporting their goods, have better productivity performance, and are more open to complex innovation strategies involving both production processes and components. Those firms, although few in number, are also driving the creation of a country's total value added, trade flows and employment¹⁰⁰. In this respect, many job opportunities have been created in service activities through exporting and studies looking at Spain and Germany show that this job creation outweighs the job losses experienced in declining manufacturing activities¹⁰¹. In addition, the fragmentation of production led to an industrial restructuring both across the European economies and between Europe and the rest of the world, which enabled European firms to specialise in the higher value-added segments of the value chain¹⁰².

Manufacturing products are, therefore, increasingly 'made in the world' and parts and components cross borders many times before the final product arrives on the market. Against this background, the national discourse recently adopted by national policy-makers promoting 'Made in...[national country]' might sound anachronistic. This seems to ignore the functioning and the benefits of GVCs as well as the fact that globalisation and the international fragmentation of the value chain are not expected to stop. That being said, it is worth thinking about how the EU could better support Member States' efforts to climb up the value chain and reflecting upon the benefits of the Europeanisation of the value chain, i.e. the possibility for firms to organise their value chains at EU level. More evidence-based policy debates are needed in this respect. In particular, the question of how the Europeanisation of the value chain could contribute to maintaining a healthy share of manufacturing in Europe and to having a strong industrial base spread over the whole territory needs to feature high on the policy agenda.

⁹⁸ OECD (2013), "Interconnected economies: Benefiting from global value chains – Synthesis report", *OECD Publications*, Paris, p.8.

⁹⁹ While offshoring refers to the activities performed by foreign manufacturing affiliates, outsourcing means contracting with other manufacturing firms abroad.

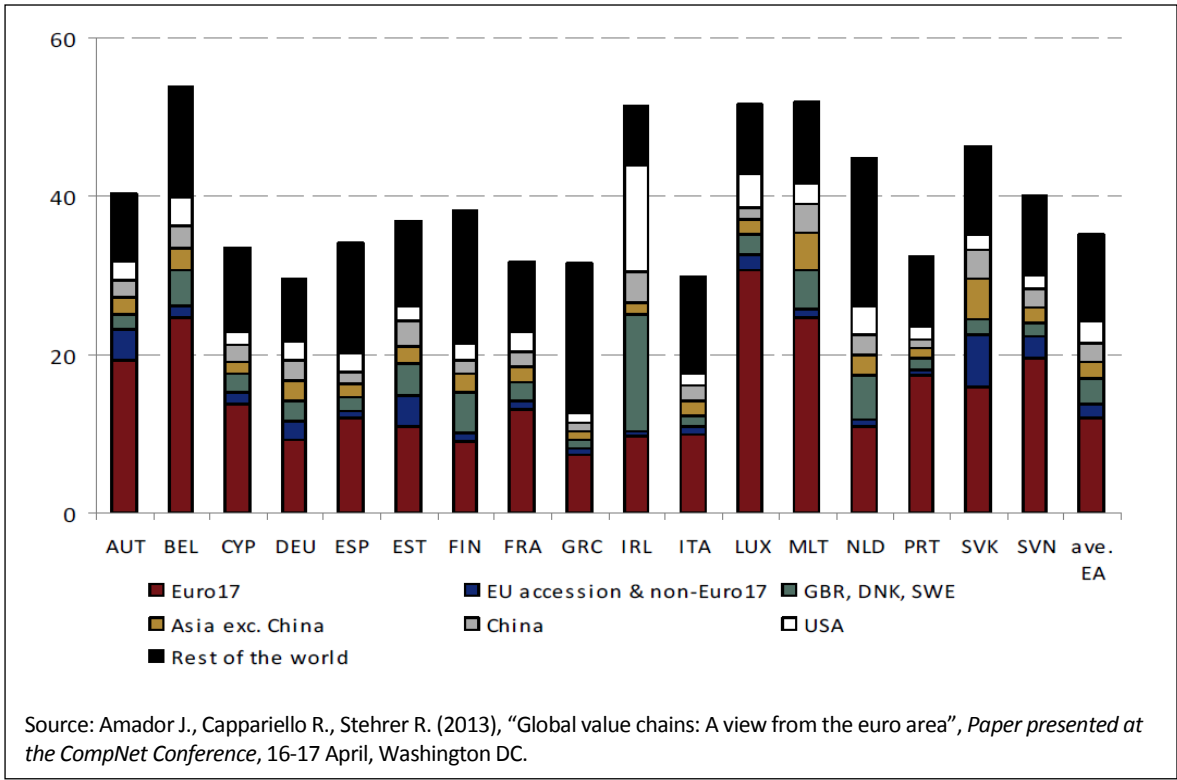
¹⁰⁰ See Veugelers R. (ed.) (2013), *op. cit.*

¹⁰¹ Di Mauro F., Hedwig P., Stehrer R. (2013), "Global value chains: A case for Europe to cheer up", *CompNet Policy Brief 03/2013*, European Central Bank.

¹⁰² *Ibid.*

Developing such an approach requires taking two empirical elements into consideration. First, the participation of European firms in GVCs is mainly EU driven¹⁰³. Looking at the euro-area, one can see that the foreign value-added in exports is – while increasing as share of exports - largely sourced from other euro area countries (see Figure 14). Looking at the EU as a whole, one can also observe that some countries, like Germany, have strongly integrated their economies with Eastern European countries¹⁰⁴. Second, this EU orientation does not disadvantage European firms. European value chain seems to generate as much benefits as the GVC. Indeed, the evidence suggests neither a productivity premium nor a discount for European firms that concentrate their international value chain on Europe¹⁰⁵. In addition, the Europeanisation of the value chain can generate additional benefits such as avoiding high coordination and transportation costs compared to GVCs. Against this background, looking at ways to further integrate the European value chain has real significance. It would create significant benefits for the European economy as a whole and help to have an industrial base evenly distributed across the whole territory.

Figure 14: Share of foreign value added (in exports) by origin – 2011 (percentages)



Enabling the emergence of the Europeanisation of the value chain should, however, not equal to protectionism. In this respect, it should be kept in mind that trade has positive effects on Europe’s industry. This is indeed EU’s most important source of growth as manufacturing achieves a trade surplus of €300 billion. Instead of protectionism, the European value chain should be based on excellence, strong differentiation factors relative to goods produced elsewhere and on the advantages of being part of a fully integrated Single Market. That being said, Europe should not be naive either. As already mentioned earlier in this paper, many industrial nations have launched ambitious strategies and put in place protective measures to defend their industries. While

¹⁰³ Variations among countries do, however, exist. The size of a country’s economy is the determining factor, as smaller countries generally display higher share of foreign value added than bigger countries.
¹⁰⁴ Di Mauro F. Hedwig P., Stehrer R. (2013), *op. cit.*
¹⁰⁵ Veugelers R. (ed.) (2013), *op. cit.*

respecting trade agreements, the EU should also make sure its firms do face the same conditions as foreign companies and are not put at a disadvantage in international competition.

In addition, moving towards a further integrated value chain at EU level does neither contradict with an external strategy for manufacturing (see the twofold Finmeccanica's strategy combining a European and global approach in box 6) nor with offshoring and outsourcing some activities. Production stages should still stay where they can be performed most efficiently. This is rather in the high value added segments of the production chain where efforts need to be deployed and where Europe needs to look at how to make industries work better together. Limiting the foreign value added embodied in EU exports and consumption goods to activities in which Europe's industry cannot offer a comparative advantage, be it due to labour costs, lack of natural resources or other production factors, should therefore be the ultimate objective.

Box 6 | How to move towards the Europeanisation of the value chain in strategic sectors – The example of Finmeccanica

Finmeccanica Aerospace and Defence industrial group has become transnational with a multi-domestic supply chain by means of a long-term strategy process, combining a European and global dimension.

Until the 90s, Finmeccanica focused mainly on the national market, although its operating companies such as Agusta helicopter manufacturing, Alenia aircraft manufacturing and OTO Melara defence systems manufacturing held foreign subsidiaries, particularly in the US. At the same time, European collaboration focused on concentrating R&D investment and sharing production costs by taking part in multilateral aircraft programmes.

By 2000 Finmeccanica was privatised by internationalising its shareholding structure, though the government held a stake. The first step of the internationalisation strategy aimed at strategic alliances with European companies by establishing a series of equal joint ventures in selected business areas thus enabling Finmeccanica to establish industrial footholds to enter foreign markets.

Finmeccanica consolidated and restructured its operating companies in the mid-1990s: Agusta was reorganised by outsourcing manufacturing to a global supply chain and focused on helicopter design and integration. Agusta also started the European Helicopter 101 (EH101, a medium lift helicopter) programme with Westland, the British aerospace company, specialised in aircraft manufacturing. Westland was a subsidiary of GKN, a British leader in the manufacture of highly complex composite and metallic aerostructures and engine products, and AgustaWestland was the positive outcome of EH101 collaboration in July 2000. Thus, Finmeccanica formed an equal joint venture with GKN and merged Agusta and GKN-Westland Helicopters. This gave Finmeccanica a firm grip on UK industrial base. A joint venture with Eurocopter for the NH90 (a medium-sized, twin engine, multi-role military helicopter) programme completed the helicopter scenario. Additional joint ventures were realised in defence electronics and missile business. Joint ventures with foreign companies having a solid foothold in domestic and foreign markets enabled Finmeccanica to transform itself into a transnational company (TNC).

These gradual steps aimed to concentrate on and specialise core business in aerospace in order to become a truly international group. As a result, shares started to float in global financial markets, and the multi-domestic market strategy obtained by establishing industrial foothold in Italy and the UK continued in the US with the acquisition of US defence electronics company DRS in 2008. Furthermore, the acquisition of the majority of the Polish helicopter manufacturer PZL-Świdnik in 2010 enable AgustaWestland to expand its presence in central Europe. Today, Finmeccanica is completing its consolidation transforming the group into a single multinational company. In a nutshell, Finmeccanica became a global player by consolidating its business, concluding strategic agreements to acquire companies, and establishing a solid supply chain in Europe without neglecting the global dimension.

Author: Claudio Catalano, Senior analyst, Finmeccanica SpA.

Policy recommendations

Developing EU's own models

- The further development of the Europeanisation of the value chain should be based on the truly implementation of the smart specialisation concept enabling quality supply chains and

relying on competitive clusters. In this respect, policy recommendations previously elaborated on these issues should be taken into account (see sections on eco-system and smart specialisation).

- Innovative business models involving non-relocatable jobs as the one based on the circular economy (described later in this chapter) should become an integral part of the Europeanisation of the value chain and help its further integration.

Deploying the full potential of the Single Market

- The remaining barriers to the free movement of goods in the Single Market should be broken down so that manufacturing industry can increase intra-EU trade and take fully advantage of the Single Market for goods. The EU should ensure that the mutual recognition principle is enforced and that the principle is accompanied by effective surveillance mechanisms.
- Given the growing importance of service-related activities in manufacturing industry, increased liberalisation of the service sector could provide opportunities for business expansion and become a determining factor in industry's location decision. A cross-border market for services could also increase business productivity. Thus, the internal market for services needs to be further integrated and the service directive fully implemented.

Promoting the 'Europe first' principle

- In addition to the recommendations related to the protection of EU's technological knowledge through IP policies (recommendation developed in the 'better and smart regulation' section) and to the reciprocity principle in public procurement (recommendation developed in the 'role of public authorities' section), the EU should promote the 'Europe first' principle. To this end, public funds, be it European or national, should favour European cooperation across countries and industries. Selection criteria in the distribution of funds should give particular attention to the impact of selected projects on the European value chain.

Following-up

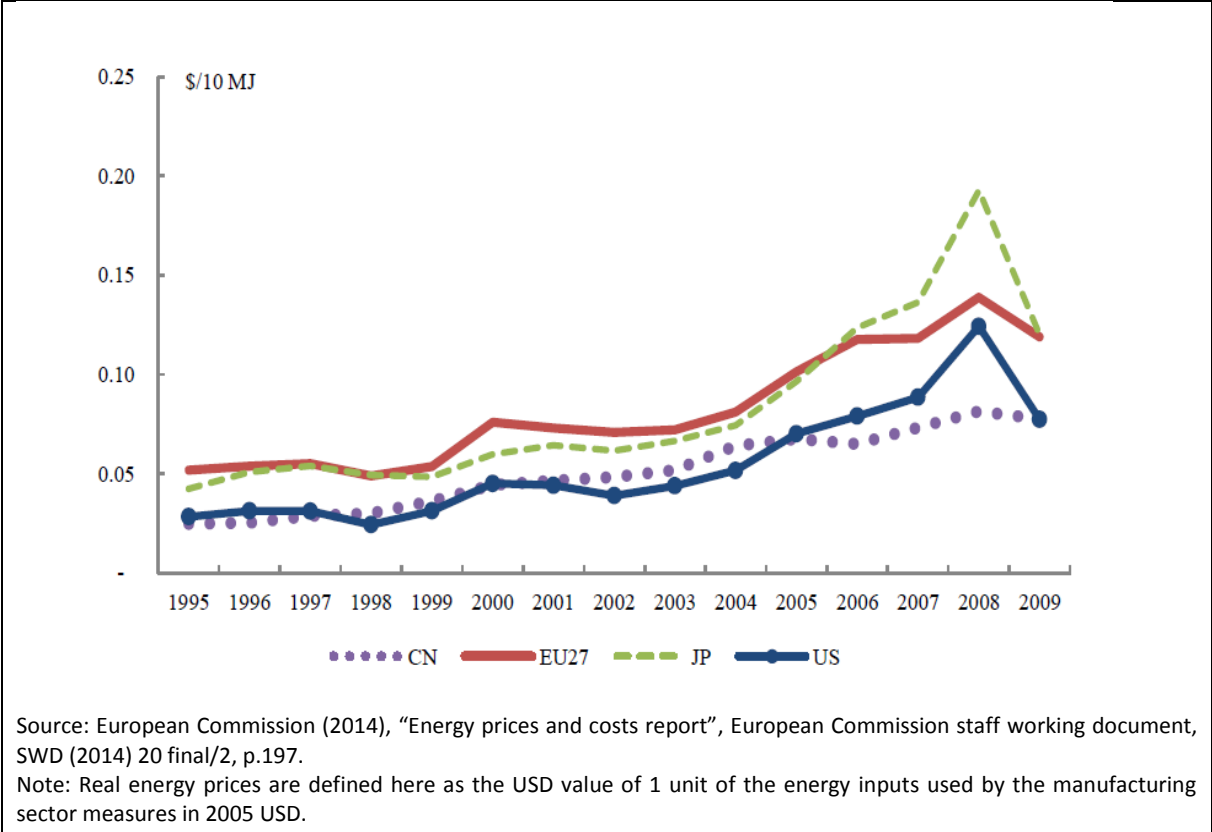
- More firm-level data is needed to design informed-based industrial policy. In particular, further cost-benefits analysis of the European value chain versus GVCs is required in order to explore to what extent further integration and better-designed policies could maximise the benefits and overcome the obstacles.

4.2.2 Optimisation of EU strengths

4.2.2.1 Completing the internal energy market

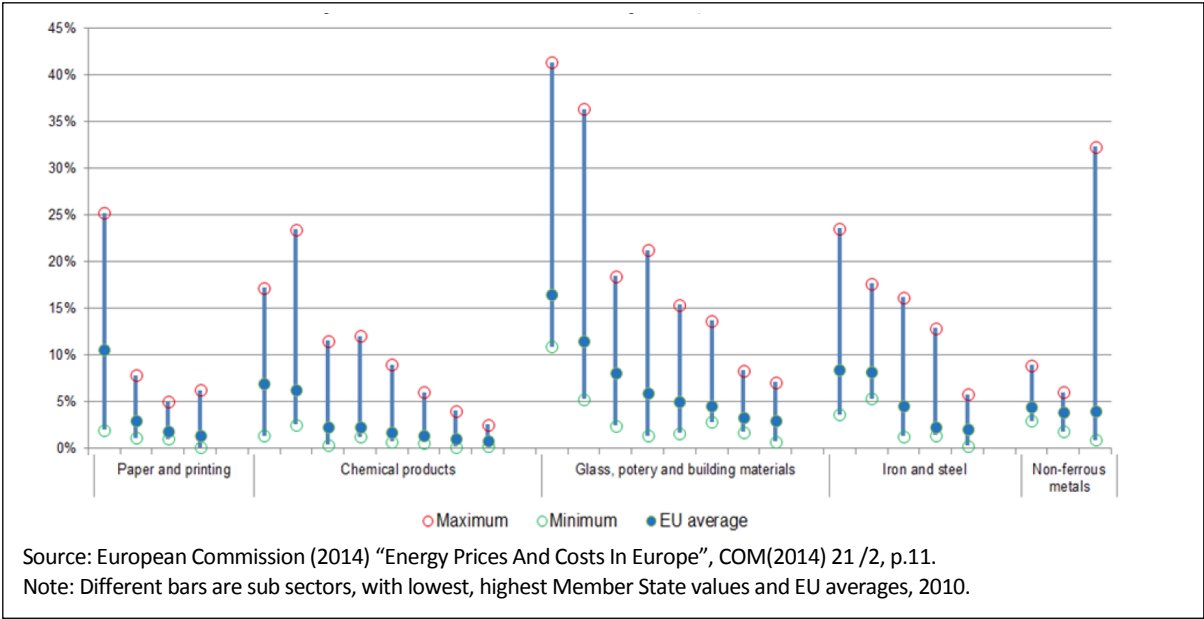
Energy is essential for production of goods and services. It is no surprise that energy prices and efficiency affect production costs, and thus, industrial competitiveness. Global comparisons as highlighted in Figure 15 show that energy costs have been on the rise across the world. The US was able to break the pattern as a result of the shale gas boom, which led to a reduction in energy prices. However the EU, together with countries such as Japan, continue to pay a higher price for energy.

Figure 15: Evolution of real energy prices in the manufacturing sector (1995-2009)



At the same time, it should be noted that the European industry has been able to save in production costs and compensate for the higher prices with improvements in energy intensity. However, more could be done, as reflected in Figure 16. Sector-specific comparison between energy intensive industries in the EU demonstrate that there are great differences in the share of energy costs as a part of production costs, suggesting also differences in performance.

Figure 16: The share of energy costs in production costs in energy intensive industries



These challenges are well-acknowledged, and it is in the interest of the EU to build a framework for action that helps to address these issues. A basic starting point is to increase collaboration and cooperation between EU Member States, in order to tackle these challenges together. Here, one of the main tools the EU has at its disposal is the internal energy market. Promoting a better functioning and a more integrated and competitive energy market would bring great benefits for all EU Member States and European consumers, including manufacturing industry.

The work has been going on for years but the internal energy market is still far from being achieved today. The EU has a common energy market on paper. A push for setting common rules for the internal energy market came with the Electricity Market Directive of 1996¹⁰⁶ and the Gas Market Directive of 1998¹⁰⁷. These were followed by other set of directives in 2003 that promoted internal market, competition and security of supply for electricity¹⁰⁸ and gas¹⁰⁹. The Third Energy Package,¹¹⁰ adopted in 2009, was an important step in an effort to open up the EU's gas and electricity markets. In 2011, all Member States agreed to complete the internal energy market by the end of 2014. Meaning that European consumers would be allowed to switch suppliers for gas and electricity, national markets and network operation rules for gas and electricity would be aligned and further investments would be made in cross-border energy infrastructure.

However, implementation has remained weak and the EU is not on track to complete the internal energy market by the end of 2014. The EU's common energy policy has been undermined by an internal challenge: a patchwork of national mini-markets, bilateral deals with Russia, lack of political cohesion and solidarity, and a failure to take consumers' interest into account in national energy decisions. Energy systems of the Member States have adapted too slowly to the regulatory developments and political objectives; transmission capacity is lacking; massive investments are needed to build the needed infrastructure; there are too many different rules across the EU; a number of Member States have not managed to liberalise their own internal energy markets and the Commission's willingness and ability to act on infringements has been weak. More efforts are needed to create the infrastructure for an internal market, be it cross-border wires for electricity or pipelines for gas. For example, Spain and Portugal cannot export their surplus megawatts of wind and solar energy to France because of lack of interconnectors. France's opposition to interconnectors because of a fear of competition that could bring cheaper electricity to its markets is a good example of short-sighted national policy that is costly for consumers, be it citizens or manufacturing industry.

Energy prices are a case in point. At the moment, there are large differences in electricity and gas prices between EU Member States. For example, as shown by Figure 17, electricity prices range between 7 and 13€ cent/Kwh for industrial consumers in continental Europe¹¹¹. As a rise in energy prices has created a lot of concern in Europe, it is worthwhile to note that this is driven mainly by increases in taxes, levies and network costs: the electricity taxation increased by 67% and network

¹⁰⁶ European Parliament and Council (1996), "concerning common rules for the internal market in electricity", Directive (1996)92;

¹⁰⁷ European Parliament and Council (1998), "concerning common rules for the internal market in natural gas", Directive (1998)30;

¹⁰⁸ European Parliament and Council (2003), "concerning common rules for the internal market in electricity and repealing Directive (1996)92", Directive (2003)54;

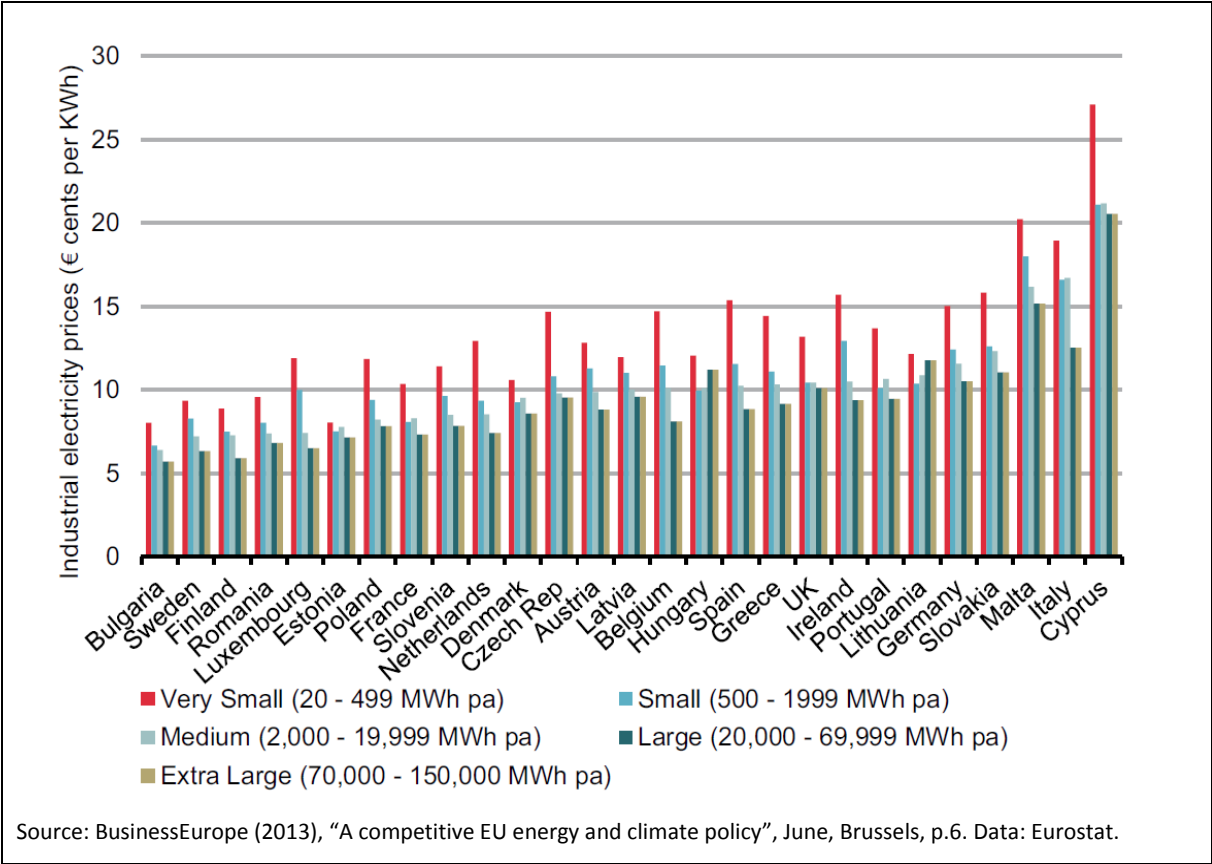
¹⁰⁹ European Parliament and of the Council (2003) "concerning common rules for the internal market in natural gas, Directive (2003)55;

¹¹⁰ Consisting of: European Parliament and Council (2009) "concerning common rules for the internal market in electricity and repealing Directive (2003)", Directive (2009)72; European Parliament and Council (2009), "concerning common rules for the internal market in natural gas and repealing Directive (2003)55", Directive (2009)73; European Parliament and Council (2009), "conditions for access to the network for cross-border exchanges in electricity and repealing Regulation (2003)1228", Regulation (2009)714; European Parliament and Council (2009), "conditions for access to the natural gas transmission networks and repealing Regulation (2005)1775", Regulation (2009)715; European Parliament and Council (2009) "establishing an Agency for the Cooperation of Energy Regulators", Regulation (2009)713.

¹¹¹ BusinessEurope (2013), "A competitive EU energy and climate policy", June, Brussels, p.6.

costs by 21% between 2008 and 2011¹¹² For example, in 2012, in Lithuania and the Czech Republic, almost 60% of the electricity price was made of network costs, while in Germany 32% and Italy 30% of the electricity price is explained by national taxes and levies. Countries such as Cyprus and Malta pay the highest price for electricity, mainly because they use petroleum products in electricity generation, and would undoubtedly benefit from diversifying their supply to include also renewables. Completing the internal energy market could help to tackle the issue: increasing competition, reducing market concentration and limiting price regulation would help to bring down energy bills.

Figure 17: Industrial electricity prices in the EU by customer size (July – Dec. 2011)



Positively, there are signs that a new understanding is emerging amidst EU Member States about the benefits of collaboration across borders. Germany’s decision to phase out nuclear has clearly demonstrated how national energy decisions have an impact on others. Indeed, the impacts of its expensive subsidies for renewables, slow progress in developing a national grid for renewables, an increase in coal power production with increased emissions, and a growing demand for nuclear energy from neighbouring countries are felt also in other EU Member States. Thus, it is becoming clear that more collaboration is needed in order to create the basis for a sustainable European energy mix. In addition, Russian aggression in Ukraine and the fears that this main supplier of energy to the EU will use energy, be it gas, oil or nuclear, as a political tool has created a new push to complete the internal energy market and bring energy security to the top of the EU agenda. Completing the internal energy market would bring significant benefits for the EU, including its manufacturing industry. According to the European Commission, a fully integrated gas market could

¹¹² European Commission (2014), "Energy economic developments in Europe", DG Economic and Financial Affairs, *European Economy Series No. 1*.

save Europeans up to €30 billion a year and an integrated electricity market up to €35 billion a year.¹¹³ It would help to increase efficiency in the distribution and use of energy, and thus security of supply. The liberalisation of the market would deliver more competition, which again would lead to lower energy prices, benefiting both citizens and industry. A more competitive energy market would offer quality services at lower cost. It would contribute to providing a framework for a cost-effective achievement of combined climate and energy objectives, creating the basis for developing renewable energy sources in a cost-effective manner and increasing energy efficiency. It would reduce dependence on imported fuels. If this was combined with negotiating gas purchases collectively rather than as individual countries, EU Member States would be able to buy external energy at lower prices through economies of scale¹¹⁴.

Take the specific example of renewables. The EU's climate and energy policy objectives for 2020 included an objective to increase the share of renewable energy to 20%, which was divided to national targets. This national approach led to - not always cost-effective and forward-looking - national support schemes for renewables. These subsidies have distorted the market and have kept investments out from those countries and regions that would have been better suited for use of renewables such as solar power. As the new European Commission hopes to make Europe a leader on renewables, this should be pursued by creating an internal energy market for renewables. First step would be to create a functioning smart grid that will integrate both existing and new renewables in the electricity network. Secondly, Member States should cooperate in placing production capacity where the sun shines and the wind blows, and stop expensive support schemes in sub-optimal places. The 2030 framework for climate and energy provides a step in the right direction. An EU-level target for renewables leaves it for Member States to estimate what potential they see for renewables in their energy mixes. In addition, the decision to include a target for interconnectors for electricity provides an important reminder that targets for renewables are not enough, if there is no functioning market to utilise the potential.

Policy recommendations:

It's time to implement existing legislation

- Common rules for completing the internal energy market exist – it is time for EU Member States to implement the rules, in particular of the Third Energy Package, and for the EU to take a stronger stance and carry out infringements procedures more readily when countries fail to act.

Recognising and communicating the benefits

- Completing the internal energy market is a positive story with enormous advantages, starting with an increase in competition that would decrease energy prices and positively impact competitiveness of European industries. It is important that these benefits, often overlooked by citizens and industry and ignored by national governments, are recognised, communicated and considered in national policy-making.

¹¹³ European Commission (2013), "Energy challenges and policy", *EC contribution to the European Council of 22 May 2013*, p.5.

¹¹⁴ However, it should be noted that there are questions around whether voluntary common purchasing would be compatible with EU law.

Incentivising investments in infrastructure

- New and upgrading old infrastructure requires further investment, both public and private. The European Commission's 300€ billion Investment Package should contribute to trigger collaboration with private and public sectors in energy efficiency projects and in building interconnectors for gas and electricity.
- Industry makes investment decisions which can be based on a 15-20 year reflection. To encourage needed investments, the industry needs stable and predictable regulatory conditions.

Going beyond internal energy market to create the basis for a forward-looking energy and climate policy

- The EU's energy policy is built on completing the internal energy market, but also on meeting the EU's climate and energy targets and promoting energy security. The EU's energy policy must contribute to a comprehensive framework for action that promotes forward-looking and cost-efficient measures that help to meet these objectives. This requires that the policy framework and the EU emission trading scheme (ETS), incentivise and encourage European industry to develop, uptake and use the best technologies available to become more energy efficient and to reduce their global emissions in a cost-effective way. Serious efforts are needed to achieve a global climate agreement that could create a level-playing field for industry across the world. As long as there is no international climate agreement, the best way the EU can contribute to reducing global emissions is to ensure that those European energy-intensive industries that are world champions in their own sector, both in energy efficiency and in reducing their global carbon footprint, will be encouraged to provide an example for others. Greater cooperation and coordination is also needed in diversifying energy supplies in and from outside the EU, which would contribute to energy security and bring significant savings in energy costs.

4.2.2.2 Strengthening the external dimension of European growth for a better impact on EU industry

With 90% of world economic growth likely to be generated outside Europe in the next 15 years¹¹⁵, it is clear that Europe's industrial policy needs to have a strong external dimension. European industries have to be more present where the growth is being created, where innovation and entrepreneurship is thriving, and where consumer spending is on the rise.

Against this background, economic diplomacy has become a buzzword in most EU Member States, influencing the substance of a country's diplomatic practice and its economic projection abroad. The severe impact of the economic crisis on Europe's internal demand and the impressive rise of new economies described earlier in this paper are pushing many European businesses to export and invest massively in the new "locomotives" of global growth. The current transformations in the international economic outlook have led to a stronger focus by virtually all European capitals on promoting their commercial interests abroad, notably but not only through diplomatic channels, multiplying high-level missions to emerging economies, creating new bureaucratic structures at home for coordinating foreign commercial policies, as well as opening or upgrading diplomatic and consular posts in emerging economies, tasked with business-supporting assignments¹¹⁶.

¹¹⁵ European Commission contribution to the European Council (2013), "*Trade, Growth and Jobs*", April.

¹¹⁶ Frontini, A. (2012), "*Advancing a multi-level system of European commercial diplomacy: is there a role for the EU?*", *EPC Policy Brief*, September, Brussels.

Member States' efforts are also supported by EU commercial policy, as trade was always a core EU's competence. Thus, the EU has traditionally played a key role in opening third markets through the use of its wider "toolbox", notably via its engagement in multilateral and bilateral trade negotiations, but also through its new "Market Access Strategy"¹¹⁷ aimed to provide exporters with information on market access conditions and a framework to tackle the barriers to trade in goods, services, intellectual property and investment. This has also been recently operationalised through the establishment of a "Market Access Database"¹¹⁸ and via regular consultations with Member States and the private sector alike, both at headquarters level and in third countries.

Nonetheless, several developments are increasingly challenging the rather rigid division of labour between EU Member States (in charge of commercial promotion) and EU institutions (tasked with "framework-setting" assignments, such as investment negotiations, market access enforcement and on-site implementation of the Common Commercial Policy) in supporting the interests of European companies in third markets.

Bottom-up initiatives, like those described in box 7, have been put in place and brand-new bodies such as self-defined "European" Chambers of Commerce and business organisations¹¹⁹ have developed strategies which have led to a stronger presence by European businesses on a global scale.

Box 7 | The contribution of EUROCHAMBRES to the creation of a European Economic Diplomacy and its benefits for European business

Representing a unique network of Chambers of Commerce and Industry across Europe, many of whom heavily engaged in international trade, EUROCHAMBRES has undertaken several initiatives to complement EU and national actions in foreign markets in order to build a European Economic Diplomacy. Its main objective is to respond to the needs of the private sector for which public actions are missing or too dispersed.

For instance, when the EU recently launched the SME Centre in China, EUROCHAMBRES developed a consortium together with bilateral Chambers and the EU Chamber in China in order to "embed" that centre within their activities, thus benefiting from their existing strengths and networks. Similarly, the European Business and Technology Centre in India (EBTC) is based on a partnership of 20 existing business and technology organisations, including bilateral and EU Chambers in India and their counterparts in Europe. Also in **South East Asia**, bilateral Chambers and related bodies are starting to "pool" their expertise so as to make a global service offer to all EU based SMEs.

All these examples follow the same logic and guiding principles of complementarity, sustainability and public-private partnership. Finding a balance between public and private sector interests, as well as between the EU and member state levels, is not an easy task. The European Union needs to be careful not to distort the market and work as much as possible with recognised stakeholders, rather than create its own stand-alone networks.

Author: Dirk Vantghem, Director of International Affairs, EUROCHAMBRES

More recently, this bottom-up process has been complemented by various "top-down" initiatives from Brussels, such as EU business support centres in target countries (e.g. the above-mentioned European Business and Technology Centre in India, the SME Centre in China, as well as the

¹¹⁷ European Commission (2006), "Global Europe: Competing in the world – A contribution to the EU's Growth and Jobs Strategy", COM(2006) 567, October.

¹¹⁸ "Market Access Database", available at: <http://madb.europa.eu/madb/indexPubli.htm>, last accessed on: 23 October 2014.

¹¹⁹ "European Chambers" were created in more than 30 countries, primarily in Asia and Latin America. While the actual structure differs from country to country, European Chambers aim to defend and promote the common economic interests of European companies.

European Business Networks in South-East Asia), the “Missions for Growth”¹²⁰ coordinated by the Commission’s DG Enterprise and Industry, business dialogues and summits, as well as “market access teams” within the EU Delegations. Such developments have, therefore, progressively added an embryonic “commercial diplomacy layer” to EU’s traditional competence in the trade policy domain, although no formal acknowledgement of the new reality within the EU has taken place yet.

While all this points out the need for developing a visible and pro-active European economic diplomacy, it also reveals a significant lack of coordination, and sometimes trust, among EU Member States and between those and EU institutions. Streamlining efforts and pooling resources in this area could bring significant added value, not only in terms of budget spending, but also with regard to coherence and effectiveness.

Policy recommendations:

Developing a more holistic economic diplomacy strategy for the EU including trade policy

- A more holistic ‘economic diplomacy strategy’ at the service of European industries should be framed, including both a reinforced implementation of the ‘market access’ components of EU trade policy and the further development of some ‘soft commercial diplomacy’ initiatives in third countries, also building on stronger institutional cooperation and practical synergies between key EU actors in this domain, including Commission’s DG Trade, DG Enterprise and Industry and the European External Action Service (EEAS).
- EU trade policy should be aligned with EU economic diplomacy strategy and both of them should complement each other. With regard to trade policy, it should ensure that it does not create competitive disadvantages for EU companies. To this end, several actions should take place. First, Europe should make sure that bilateral trade agreements contain reciprocity clauses, not only with regard to access to public procurement but also to innovation policy. Second, EU surveillance mechanisms should play a greater role in the assessment of the impact of free trade agreements (FTA) and their possible adaptation to the global context.

Empowering the role of EU Delegations around the world

- The growing role of EU Delegations as catalysts in several emerging economies could be further enhanced by adding *upstream* tasks such as market scouting and economic intelligence, including sectoral studies, at the service of all Member States, or even *downstream* functions like occasional ‘soft’ advocacy for European *consortia* running against non-EU competitors for public procurement tenders.
- More regular business-focused instructions to EU Heads of Delegation, more systematic consultation with public and private stakeholders locally (but also in Brussels), and more targeted use of public diplomacy to ‘brand’ Europe as an export and foreign direct investment (FDI) destination could all provide a valuable EU agenda for economic diplomacy.

¹²⁰ “Missions for Growth”, available at: <http://ec.europa.eu/enterprise/initiatives/mission-growth/missions-for-growth/>, last accessed on: 23 October 2014.

Fostering an intra-European reflection on commercial diplomacy

- A substantial reflection should be conducted by EU institutions and Member States alike on the opportunity to sketch out a common EU approach in this area. This might also explore ways to improve synergies among locally-based European actors, including pilot projects like more ‘pooling and sharing’ between bilateral Chambers of Commerce or even some national commercial services, in coordination with the EU Delegations.

Mobilising further human and financial resources in the service of EU’s economic diplomacy

- Further EU human and financial resources should be mobilised, e.g. via targeted on-site training for EU staff, and secondment of specialised personnel from Brussels and national capitals, but also through the use of public-private partnerships to finance EU business centres.

Coordinating European efforts on SMEs’ internationalisation

- A coordination platform for SME internationalisation should be created in Europe, in order to ensure the development of a single strategy, to avoid overlap and increase effective use of resources.

Reviewing EU’s “Missions for Growth”

- “Missions for Growth” should be carefully examined with a view to increasing inter-service coordination of planning and policy relevance, as well as to ensure the full commitment of Member States, including by involving national Ministers of Foreign Affairs and/or Trade on a more regular basis.

Setting the cornerstones of a “multi-level” system of European economic diplomacy

- All proposals for further EU action in this area should be based on the principles of subsidiarity, complementarity and non-discrimination *vis-à-vis* measures by Member States and the private sector, with the aim of framing an effective “multi-level” system of European economic diplomacy, combining national and EU assets, and via a genuine public-private partnership.

4.3 ENHANCING SOPHISTICATION FACTORS

4.3.1 *Boosting innovation*

Innovation of today is the protection of market shares of tomorrow. As chapter 2 has shown, innovation is closely related to competitiveness and industrial outputs, and is a key differentiator enabling manufacturing firms to position themselves strategically in global value chains. This is why Europe must continue to deploy all its efforts in supporting innovation.

Investment in R&D is clearly a pre-condition for boosting innovation but evidence has shown that this is far from being sufficient. The innovation divide across the EU described in chapter 2 is not only due to differences in R&D investment but also to Member States' capability to maximise the impact of their scientific research base. A large part of Europe's research is focused on basic research, unlike other industrial countries such as China, which opts for applied research enabling the transformation from research into commercialisation of advanced products¹²¹. In a nutshell, one might say that "the EU leads the way in basic research and that others commercialise the ideas"¹²². Focusing on applied research output, by making sure that it is commercially exploitable, instead of input, measured by the amount of R&D spent, is therefore crucial for Europe.

Achieving further productivity gains through innovation is key but not the only objective. With technological developments spreading to emerging economies, enabling them to steadily increase their productivity, Europe must now find other comparative advantages to maintain its competitiveness. Consumers' expectations have changed and they are no longer satisfied with standardised products. Europe therefore has to use innovation as a vehicle for enhancing mass customisation. Personalised products are increasingly in demand and issues surrounding sustainability and resource scarcity have become more important to buying habits. As advanced economies, it is therefore the capacity to create complex, sustainable, customised and high-value added products with embedded services, which will enable European countries to maintain their position in the global value chain.

Spreading new technological innovation is the right way to meet new consumer expectations and to open the door to a generation of more intelligent and specialised products. For instance, sensory intelligence in automobiles enhances performance and safety, additive manufacturing can speed up prototyping processes, and the digital economy can generate big data in order to facilitate greater experimentation during the design stage¹²³. These examples show however, that producing intelligent and specialised products also requires new production techniques. As an example, the use of automation for advanced materials will have to become more widespread in order to be cost-effective and to enable mass production. Therefore, technological innovations will have to be applied along the entire production chain and to be integrated not only in materials but also in product design, production processes and business models. In other words, creating value should not rely solely on the product. Technological progress made in one segment of the production chain will have to be accompanied by progress in another.

Furthermore, the use of innovative technologies is key to favour the emergence of new services, which are crucial to meet customers' expectations, to offer customised solutions, and therefore to

¹²¹ Only 5% of China's total R&D is devoted to basic science, compared with 15-20% in other major OECD nations. See: R. Van Noorden (2014), "China tops Europe in R&D intensity", *Nature*, vol. 505.

¹²² European Commission (2011), "Final report from the high level expert group on key enabling technologies", p. 20.

¹²³ See McKinsey (2012), *op. cit.*

maintain manufacturing in Europe. Collecting data can for instance enable firms to develop pre- and post-sales services. In this respect, the Spanish firm Orkli, developing heating control systems for homes and businesses and now specialised in digital climate control and solar heating systems, is a case in point. By analysing the client's heating history and future needs, the company is able to recommend newer, more cost-efficient technologies¹²⁴. Box 8 provides additional examples of innovative technologies applied by the chemistry industry.

Box 8 | The key role of innovation in addressing current challenges – The example of Phase Change Materials in chemistry industry

The European chemical industry is key for economic development and wealth, providing modern products and materials and enabling technical solutions in virtually all sectors of the economy. With a workforce of 1.2 million and sales of €527 billion (2013), it is one of the largest industrial sectors and an important source of direct and indirect employment in many regions of the European Union. Traditionally, Europe has been a leader in chemicals production – as shown by a consistent export surplus which reached a record of 49 billion euro in 2013.

Certain trends are however unmistakably taking place. The shift of manufacturing to Asia and associated higher chemicals output growth there, an ageing population in Europe and the shift of petrochemicals production to resource-rich countries are a few examples. They all point to a declining share of the Europe based chemical industry in global production and exports. Innovation policy is one of the key policy measures that can help reverse this trend incentivising the transformation of big and unconventional ideas into great possibilities for a better society.

In order to address current economic and societal challenges, the chemical industry is taking part in the European innovation partnership in smart cities and communities. In this context, it has introduced a series of innovative materials contributing to energy efficiency of buildings. Among these materials are the Phase Change Materials (PCM).

PCM are available on the market as an active ingredient of a range of semi-finished materials such as plaster, plasterboards, multifunctional wall and roof modules or films. When used in interior walls and/or ceilings, PCM enables such walls and ceilings to absorb and store excessive heat during the day, in order to dissipate that excessive heat at night when air temperatures go down. PCM basically increases the thermal inertia of the wall and ceilings, making them behave like the old-fashioned thick stone walls found in buildings of hundreds of years ago. As such, PCM contained in walls and ceilings reduce the extreme fluctuations of the inside temperature and thus save energy.

In recent tests, PCM have demonstrated a life expectancy of 30 years without losing any performance. It has been shown that up to 10% of cooling energy can be saved, reducing therefore the need for air conditioning (AC) system.

Authors: Joint efforts from CEFIC staff

Source: Bax Laslo, Crucent Judith, Komornicki Jacques, "Innovative chemistry for energy efficiency in buildings", *SusChem and Smart Cities & Communities*, study available at:

<http://www.cefic.org/Documents/PolicyCentre/Innovation/Innovative-Chemistry-for-Energy-Efficiency-of-Buildings-in-SmartCities.pdf>, last accessed on: 30 October 2014; website on innovation in the chemistry industry, available at: <http://www.innovation-for-growth.eu/home>, last accessed on: 30 October 2014.

Going beyond investment in R&D, allowing a good command of cost-efficient technologies, and creating an innovation-friendly business environment in Europe is needed. Several national and EU initiatives have recently been undertaken to establish such an environment. For instance, Member States launched programmes and strategies to ensure that they will meet their R&D targets¹²⁵ and to make their research and innovation systems more efficient¹²⁶. At EU level, a series of promising measures have been adopted under the Innovation Union¹²⁷ and the European Research Area (ERA)¹²⁸. For instance, one can observe a

¹²⁴ See: <http://www.orkli.es/in/empresa/home.html>, last accessed on: 10 November 2014.

¹²⁵ The 3% target of EU GDP on R&D set by the Europea 2020 strategy is broken down by Member States. For an overview of Member States' targets on R&D, see: http://ec.europa.eu/europe2020/pdf/targets_en.pdf, last accessed on: 6 November 2014.

¹²⁶ These initiatives respond to the objectives of the European Research Area. See: European Commission (2013), "State of the Innovation Union 2012 –Accelerating change", COM (2013) 149 final.

¹²⁷ Innovation Union is one of the flagship initiatives of the Europe 2020 strategy.

See: http://ec.europa.eu/research/innovation-union/index_en.cfm, last accessed on: 6 November 2014.

better alignment of funding instruments, in particular Horizon 2020¹²⁹ - the new framework programme for Research & Innovation - with the priorities of the Innovation Union. Interestingly, a stronger emphasis is put on output-driven activities such as testing, prototyping and pilot projects. In addition, the European Commission decided to elaborate a strategy¹³⁰ to develop six Key Enabling Technologies¹³¹ (KET) as well as the most effective way to bring them to the market. These six KETs are photonics, industrial biotechnology, nanotechnology, advanced materials, micro-/nanoelectronics and advanced manufacturing systems. Focusing efforts on trans-sectoral technologies, which can be applied in all manufacturing industries of systemic relevance and cutting across many technology areas, is the right approach as it bears the potential to benefit many manufacturing sectors and the entire European value chain.

Despite these steps forward, a number of obstacles still prevent Europe from establishing the right environment for an innovation-driven growth. One of the most worrying consequences of these bottlenecks is Europe's difficulty in promoting young innovative firms, which are crucial for productivity and employment growth as well as investment in R&D¹³². Yet data shows that young leading innovators (called yollies) are fewer in number than in the US and far less R&D intensive. A key explaining factor of this discrepancy is the difficulty European yollies have in accessing finances and as well as getting high returns on R&D¹³³. Box 9 provides an example of interesting measures undertaken by the state to favour the growth of young innovative companies.

Box 9 | A Scheme for Young Innovative Companies - A French example

The "Young Innovative Company" (YIC) status that France introduced in 2004 confers tax exemptions on SMEs (fewer than 250 employees) which spend at least 15% of their total annual expenditures on R&D. These companies are exempted from all income tax and all capital gains tax for eight years after their creation. These fiscal measures provide incentives for both companies and investors. A pan-European initiative inspired by this example and aiming to give special recognition, under EU state aid rules and national fiscal policies, to young and innovative companies could boost EU innovation capacity.

Source: Website of BPI France, available at: <http://www.bpifrance.fr/Bpifrance/Notre-mission>, last accessed on: 31 October 2014.

Turning research into the commercialisation of innovative products in order to secure a strategic position in the global value chain is clearly a challenge, which requires all policies to pull in the same direction. Policy recommendations developed earlier in this paper, in particular the capacity to create an ecosystem in which technological institutes are better integrated in business development strategies, facilitating access to finance enabling SMEs and yollies to grow and to become more innovative and favouring the emergence of new partners across industries and across regions, are of

¹²⁸ For more information on the ERA, see: http://ec.europa.eu/research/era/index_en.htm, last accessed on: 6 November 2014

¹²⁹ For more information on Horizon 2020, see: <http://ec.europa.eu/programmes/horizon2020/>, last accessed on: 6 November 2014.

¹³⁰ European Commission (2009), "Preparing for our future: Developing a common strategy for key enabling technologies in the EU", COM (2009)512/3.

¹³¹ KETs are defined as follows: "KETs are knowledge intensive and associated with high R&D intensity, rapid innovation cycles, high capital expenditure and highly-skilled employment. They enable process, goods and service innovation throughout the economy and are of systemic relevance. They are multidisciplinary, cutting across many technology areas with a trend towards convergence". See: European Commission (2009), "Current situation of key enabling technologies in Europe", European Commission Staff Working Document SEC (2009) 1257, p.2. See also: High-Level Expert Group on KETs (2014), *op. cit.*

¹³² While business R&D in Europe only accounted for 1.22% of EU GDP in 2012, it represented nearly 2% of the US GDP (OECD data). See: Cincera M., Ravet J. and Veugelers, R. (2014), "R&D financing constraints of young and old innovation leaders in the EU and the US", *Working Paper 008*.

¹³³ See: Cincera M., Ravet J. and Veugelers, R. (2014), *op. cit.*

utmost importance. Below are additional recommendations, complementary to those highlighted in the above sections, with a view to drawing-up a fully-fledged innovation strategy.

Policy recommendations

Fostering a new approach to R&D at the EU and national level

- The EU needs both to focus more on technological research and to move away from the focus on basic research projects in this regard. A larger share of EU funding should be dedicated to applied research for advanced manufacturing products, i.e. on product development activities including pilot lines, prototypes and demonstrator activities.
- Measuring progress towards maximising innovation output and return on R&D investment is key. The EU has already explored ways of achieving this objective and has decided to compare the number of fast growing innovative firms across the EU¹³⁴. However, using such an indicator required further work, in particular data collection. Although the decision was a first step in the right direction, progress to implement this indicator should be accelerated. In addition, this indicator should be brought forward in existing governance tools such as the European Semester so that public attention focuses on industrial innovation and not merely on science base excellence.

Stimulating the demand-side of innovation

- Member States as well as the EU tend to boost innovation through a supply-driven approach. However, the demand-side of innovation policy is equally important. Market pool mechanisms should be reinforced. To this end, public authorities should make greater use of public procurement to support demonstration projects and the public sector should act as a first customer for advanced products, not least to address some societal challenges, such as demographic ageing or resource scarcity. A better monitoring of public technology procurement is therefore needed at the EU level. In this respect, the EU should set an indicative target for Member States.
- A large European Investment Scheme for innovation in manufacturing is needed to act one of the market pool mechanisms. The investment programme of €300 billion announced by President-elect Juncker should therefore contain priority lines to innovation in manufacturing.

Addressing the market failures faced by innovative firms

- Many measures could favour the growth of European yollies and internationalisation. In addition to facilitate their access to finance (see section on access to finance), a better integration of yollies in clusters could be of significant help, in particular for risk-sharing.

¹³⁴ European Commission (2010), "Europe 2020 Flagship Initiative, Innovation Union", COM (2010) 546 final.

Highlighting the detrimental impact of R&D offshoring

- Developing evidence about the off-shoring of European R&D activities and its detrimental impact on manufacturing and its capacity to innovate is key. Such trends should be monitored by the EU and integrated in the existing inter-country statistical cooperation on off-shoring.

4.3.2 *Becoming a leader in new business models*

Our economic and industrial model is based on a “take, make and dispose” approach. Together with a growing and evermore consuming middle class in the world, this puts an enormous strain on global resources, including energy sources, water, land, food and minerals, and at the same time on the environment. It is becoming clear that this linear approach to use of different materials is no longer sustainable. Overexploitation of resources and environmental destruction are leading to resource scarcity, which can have far reaching and unforeseeable economic, social, environmental and security implications. One of the impacts, strongly felt by industry, is the +150% increase in world commodity prices between 2002 and 2010¹³⁵. This rise in prices has been most significant with industrial raw materials, largely due to increased demand in China.

European industry is extremely vulnerable in the face of this global resource challenge. European companies outsource the largest share of resource extraction in the world. In 2013, raw materials, including energy imports, were worth €704 billion¹³⁶. The EU is dependent on energy imports such as oil and gas from just a few suppliers – including Russia. It relies on outside sources of raw materials for chemical, construction and other industrial sectors. For example, it needs rare earths from China to feed its high-tech and environmental industries. As global competition for resources continues to increase, world commodity prices rise and become more volatile. At the same time, resource supplies become less secure.

It is in the EU’s and European industry’s interest to reduce this vulnerability¹³⁷. Companies which improve their resource productivity will be more competitive in resource-scarce markets. They will be less affected by resource and environment related challenges, supply disruptions and volatile prices.

It is a great contradiction that while Europeans acknowledge their resource-dependency, waste keeps on accumulating at the same time, not enough materials are recycled and valuable materials are continually lost or shipped outside the EU. Every year, the EU produces around three billion tonnes of waste, of which activities such as manufacturing produces 360 million tonnes and construction 900 million tonnes¹³⁸. As only 40% of solid waste is recycled, this accounts for a significant loss of resources for a resource-dependent Europe. For example, recovering 10 kilograms of aluminum via recycling, uses less than 10% of the energy needed for primary production¹³⁹. As another example, it has been estimated that a ton of electronic scrap from

¹³⁵ World Economic Forum, in collaboration Ellen MacArthur Foundation and McKinsey & Company (2014), “Towards the circular economy - Accelerating the scale-up across global supply chains”, Geneva.

¹³⁶ See the website of DG Trade, European Commission: <http://ec.europa.eu/trade/policy/accessing-markets/goods-and-services/raw-materials/>, last accessed on: 4 November 2014

¹³⁷ For more information see: Ahtonen A., Chiorean-Sime S. (2012), “Green revolution: making eco-efficiency a driver for growth”, *EPC Issue Paper no. 68*, Brussels.

¹³⁸ European Commission brochure (2010): “Being wise with waste: the EU’s approach to waste management”.

¹³⁹ Science Daily (2009), “Set World Standards For Electronics Recycling, Reuse To Curb E-waste Exports To Developing Countries, Experts Urge”, 17 September, available at: <http://www.sciencedaily.com/releases/2009/09/090915140919.htm>, last accessed on 31 October 2014.

personal computers contains more gold than what can be recovered from 17 tons of gold ore¹⁴⁰. 6,000 used mobile phones contain about 3.5 kilograms of silver, 340 grams of gold and 130 kilograms of copper¹⁴¹. If done on a global level, a McKinsey study suggests that the transition towards a circular economy on a global level would lead to material savings of more than \$1 trillion a year by 2025¹⁴².

While most businesses acknowledge that better use of resources helps to cut costs and thus improve competitiveness, there is undoubtedly room for improving business models. It has been estimated that, for example, British businesses would gain around €28 (£23) billion annually by taking no-cost or low-cost measures to improve the way they use energy and water, and by reducing waste. By implementing measures with a payback period of over a year, the additional savings opportunities would be worth around €40 (£33) billion, leading to total annual savings of €66 billion¹⁴³.

At the same time, also good examples exist. Some companies have taken steps to change their business models, to reuse more products or components and restore important material, energy and labour inputs – while enjoying the benefits. As described in box 10, the French car company Renault remanufactures some of its used parts at 30-50% production cost¹⁴⁴. Producing remanufactured parts compared to new parts has enabled them to use 80% less energy, 88% less water, 92% less chemical products, and 70% less waste.

Companies such as Philips have already seen the benefits of considering consumers as users rather than buyers for their products. Philips Healthcare has shifted its activities from selling products to selling services: it leases equipment to its customers and after use, upgrades and refurbishes the product, before leasing it to other customers. The Dutch company estimates this part of their activity to be worth €200 million¹⁴⁵. They have also started to sell lighting as a service. As a result customers can have latest technology lighting with high energy efficiency, without paying the upfront costs. At the same time Philips is in a better position to collect and recycle the lamps, and reduce its use of new materials. Creating services capabilities attached to a specific product could therefore create non-relocatable jobs, increase the need for having some of the production stages close to where services are delivered and reduce the need for offshoring.

These examples demonstrate that it makes sense for industries to make their business models more sustainable and reap the benefits. At the same time, it is worth to acknowledge that the benefits would be even greater if the system as a whole supported more sustainable production and consumption patterns. This would require collaboration between business and research centers, policy-makers and investors. Transition to a circular economy, where resources and materials would be restored and reused across value chains would require changes not only to business and market models, but also to product design, how waste is turned into a resource and to consumer behaviour. For example, while companies can themselves aim to maximize the reusability of products and components when designing them, the benefits would be greater if we had in place an industrial system where products are designed and optimised for disassembly and reuse, and if the components and resources were used over and over again in the system – to the extent that is possible.

¹⁴⁰ USGS Fact Sheet (2001), “Obsolete Computers, ‘Gold Mine’, or High-Tech Trash? Resource Recovery from Recycling”, *U.S. Geological Survey*, U.S. Department of the Interior.

¹⁴¹ Science Daily (2009), *op. cit.*

¹⁴² Nguyen H., Stuchtey M., Zils M. (2014), “Remaking the industrial economy”, *McKinsey Quarterly*, February.

¹⁴³ Oakdene Hollins (2011), “Further Benefits of Business Resource Efficiency”, *Final Report*, UK Department of the Environment, Food and Rural Affairs, March, London.

¹⁴⁴ Ellen MacArthur Foundation, “The circular economy applied to the automotive industry”, Cowes, U.K.

¹⁴⁵ Fleming T., Zils M. (2014), “Toward a circular economy: Philips CEO Frans van Houten”, *McKinsey Quarterly*, February.

Box 10 | The implementation of the circular economy model in the automotive industry

Circular economy is present within the Renault Group. This business model is not only applied through a new way of dealing with the production process but also through a new approach to end-users.

How is the circular economy model applied in the Renault Group?

In the model implemented by Renault, waste has become a resource for the supply chain and the commercial network, materials are used to their fullest potential and manufacturing pieces are reused as much as possible. This circular economy system is put in place progressively with different players that develop and organize material loops that are called “closed loops”.

End-users are put at the heart of Renault’s business model and new types of offers are made to Renault’s clients. For instance, clients have the possibility to lease battery, or to use remanufactured mechanical parts, and after sales services have been developed in France for reused spare parts in order to prolong the life of old vehicles that are declared economically irreparable by insurers.

Strong collaboration with different players

Before putting in place the closed loops, it is important to establish collaboration with all stakeholders involved in the process in order to identify the right solutions. In view to turning all pre-and post- production activities into a coherent system, Renault has engaged in multidisciplinary networks, bringing together big industries with SMEs (even start-ups), as well as players of the scientific or academic world in order to find new technological or knowledge innovation.

INDRA (since 2008 joint-venture between Renault Environment & Suez Environment), is specialised in the dismantling of end-of-life vehicles in France. Through its business, INDRA is a major player of the implementation of material loops and the offering of re-used spare parts. Since September 2012, these spare parts have allowed to prolong the duration of life for more than 2500 vehicles, leading to a twofold advantage. The first advantage is to avoid the destruction of vehicles and the second one is to preserve the mobility of clients who are economically constrained by offering them spare parts at a lower price (by 50 to 70% cheaper than new parts).

Closed loops of material also allow a decoupling of the end-product price from the volatility of raw material prices. It reduces the price of the vehicle while continuing to ensure high-quality products. For example, the amount saved by using recycled plastics accounts to 14€ on each Captur*. Today, 29.7% of Renault vehicle materials are from recycled products. The objective is to raise this rate by 10% by 2016.

INDRA coordinates a network of 400 SMEs distributed throughout the French territory in order to collect local end-of-life vehicles. INDRA develops processes and permanent tools for optimizing the dismantling of vehicles, the collection process of material and the distribution of reused spare parts.

On the Renault side, eco-design requirements have been implemented in order to optimize the dismantling, the remanufacturing and the reuse of spare parts, and also the sorting of materials. The involvement of the scientific and academic world is an important pre-condition for ensuring innovative eco-design.

Some challenges for enterprises

Circular economy obliges each player to rethink the production and consumption model. It represents a challenge for enterprises, which have to change their business models and modify their commercial and accounting habits. The material loop requires different skills and expertise in three main areas: technical innovation, collaboration, and economy. Everything has to be technically and qualitatively optimized to be more economically profitable. A transversal approach, taking into account the entire life cycle of the product, is needed for assessing balance-sheets and a project’s profitability.

Author: Jean Philippe Hermine, Vice President in charge of Strategic Environmental Planning, Renault Group

* Captur is one of the car models manufactured by Renault.

The benefits for European industry would be significant. The Commission Communication “Towards a circular economy: A zero waste programme for Europe” estimates that increasing resource efficiency could help to reduce material input needs along the value chains by 17%-24% by 2030, and that more

efficient use of resources could help European industry to save annually €630 billion¹⁴⁶. At the same time developing a circular economy which would create new markets, new products and value for business could boost EU GDP by up to 3.9%. There is great potential, for example, in enhancing recycling business, that is already an important local employer, and it has been estimated that only implementing existing waste legislation could create 400,000 jobs¹⁴⁷. The benefits are also recognised in the Commission Communication “For a European Industrial Renaissance”¹⁴⁸.

To encourage industry to adopt new business models that would support a transition towards a circular economy requires, first of all, a better understanding of the positive impacts and needed measures. It is easy to stay locked in linear models or fear that the costs of the transition outweigh the benefits, if there is no evidence to prove otherwise. More research is needed to demonstrate the positive impact of this transition on companies’ competitiveness and to identify what kind of business models and investment decisions are the most successful. This requires identifying sectors and materials which would benefit the most from a circular approach and lead to greatest economic and environmental gains. In its 2014 report, the Ellen MacArthur Foundation shows that in the manufacturing sector, the materials-intensive automotive, machinery, and equipment industries would enjoy the highest long term gains¹⁴⁹. For its part, the European Commission commissioned a scoping study to identify potential circular economy actions, priority sectors, material flows and value chains¹⁵⁰. The study identified agricultural products and waste, wood and paper, plastics, metals and phosphorus as priority materials and packaging, food, electronic and electrical equipment, transport, furniture, buildings and construction as priority sectors.

Investment and access to finance are also important challenges. Companies must have the resources to change their business models and invest in product design and innovative processes. Policy makers must provide a framework fit to stimulate private investments. The European Commission has recognised that encouraging investments in resource efficiency by shifting taxes from labour towards pollution and resources, phasing out environmentally harmful subsidies, promoting green public procurement and developing Public Private Partnerships are useful instruments. In addition, using public funds to develop waste treatment infrastructure is a necessity as companies cannot always cost effectively repair or reuse their products¹⁵¹.

SMEs are particularly vulnerable to price volatility and do not necessarily have the resources to adopt new business models. The European Green Action Plan, which aims to contribute to the re-industrialisation of Europe, estimates that 75% of SMEs in the EU experienced an increase in their costs of materials in the past five years¹⁵². The Plan outlines a set of actions to support these enterprises. Actions include supporting efficient technology transfer mechanisms for green technologies, facilitating cross-sectoral collaboration and promoting a greener internal market. These are positive developments and access to finance for SMEs should remain high on the EU green agenda.

¹⁴⁶ European Commission (2014), “Towards a circular economy: A zero waste programme for Europe”, COM (2014)398.

¹⁴⁷ *Ibid.*

¹⁴⁸ European Commission (2014), “For a European Industrial Renaissance” COM(2014)14/2.

¹⁴⁹ World Economic Forum, in collaboration Ellen MacArthur Foundation and McKinsey & Company (2014), “Towards the circular economy - Accelerating the scale-up across global supply chains”, *2014 Report*, January, Geneva.

¹⁵⁰ European Commission (2014), “Scoping study to identify potential circular economy actions, priority sectors, material flows and value chains”, *Final report*, August.

¹⁵¹ European Commission Communication (2014), “Towards a circular economy: A zero waste programme for Europe”, COM (2014)398.

¹⁵² European Commission Communication (2014), “Enabling SMEs to turn environmental challenges into business opportunities”, COM (2014)440.

The linear economy is built on complex and geographically dispersed value chains. Materials, components and products are in the hand of different actors which do not necessarily cooperate with each other. In the circular economy, cooperation throughout the value chain is crucial in order to implement network activities in which products are turned into components and materials while ensuring that all actors reap the rewards. Manufacturers which adopt new business models, redesign their products and practices have to work closely with suppliers and waste professionals. By doing so, manufacturers can maximise the number of consecutive product cycles, bring their costs down and increase their competitiveness. Waste professionals will no longer have a product at the end of its life cycle at their disposal but a resource fit to be reincorporated into production. Policy makers should take this interaction and interdependence into account when elaborating and implementing legislation which will have an impact on all phases of the production process.

The complexity of global value chains raises the issue: which scale works best to close the loop? An industrial symbiosis model, where companies can sell their by-products and waste to each other, works better if they are geographically close. This physical proximity would also help to bring down costs as it would encourage using common infrastructures and treating different waste types more efficiently. Also leasing, selling services rather than products, would benefit from physical proximity. Having manufacturers operate close to where the products are used, would also allow companies to strengthen ties with customers. However, as the circular economy follows the rules of supply and demand, the loop can also work on a larger scale. As China is a major exporter of consumer products, there is natural demand for recyclates that can be turned into finished goods, and then sold back to Europe. More information is needed to understand the benefits of different scales for operations and to determine if there are any re-shoring opportunities¹⁵³ for Europe, for example, in the recycling sector.

Using Europe's dependence on foreign resources as a springboard to improve its own competence in re-using and refining resources, eco-design and waste treatment solutions could make the EU a global expert and world leader. This could have the additional benefit of helping the EU, in close cooperation with its trade partners, to become a standard setter for the global market.

Policy recommendations

Creating a knowledge base for action

- Identify sectors and materials that would benefit the most from a circular approach, including what are advantages and challenges with different scales of operations, is necessary to lay the foundations for a change in our business models. Furthermore, it is key to communicate and exchange knowledge on the benefits of increased resource efficiency and of a transition to a circular economy across industry. In particular, facts and figures about the impact of new business models on manufacturing jobs should be shared widely.

Building the basis for a sustainable industrial policy

- The EU needs to support development and competitiveness of industry, that can bring added value to global markets and that continuously looks for ways to make its production or services fit for the future. The environment for doing business is changing and has changed: the impacts of resource scarcity, increasing commodity prices and changing

¹⁵³ Reshoring is the practice of bringing outsourced personnel and services back to the location from which they were originally offshored; for more information see: EPRS (2014), "Reshoring of EU manufacturing", *Briefing*, 21 March.

consumer habits cannot be ignored. These considerations must be taken into account in the EU policy framework as well as in the industrial operations and strategies, if European industry wishes to remain competitive. A modern competitive industry recognises the importance of using resources more efficiently, it sees the potential with re-using, refurbishing and recycling products and materials, and it considers new business models such as changing practices from selling products to services. It is the task of the EU to guide and help the industry to take the right path.

Creating a market for recycling, recovering and reusing materials

- Where it works, the EU internal market is Europe's main driver of competitiveness, security of supply and sustainability. However, currently it is cheaper to send used plastics to China than recycle them in Europe, because of bureaucratic and technical problems between EU Member States. The EU must help to remove these barriers and build an internal market for products and services that contribute to creating a more sustainable economy. Effective use and reuse of resources require creating a market for secondary materials.
- There must be a pull, not just a push for eco-efficient products and services. Framework conditions such as taxation policy should provide a favourable environment for greener growth. Minimum performance standards would help to remove the least resource-efficient products from the market. Harmonised implementation and better enforcement of pan-European legislation such as the Waste Framework Directive or the Eco-design Directive are needed to create a level playing field. Also Extended Producer Responsibility, green public procurement and EU funds could help to create demand for a market for re-use and recycling. It is in the EU's interest to promote industrial policy and resource management together, in order to concretise the benefits for European industry.

Including all stakeholders

- In a circular economic model the interaction and interdependence between all economic actors (including suppliers, manufacturers, consumers and waste professionals) of the production and innovation chain is even more important than in a linear model. Policy makers should take this element into account when developing legislation and designing public-funded programmes which will have a direct or indirect impact on several or all phases of the circular economy.

Creating a framework conducive to investment in innovative product design and processes

- A policy framework must enhance confidence to long-term investment. It must use tools available to incentivize companies to move from a linear to circular model, and help to guide investment decisions. This includes encouraging shifting taxes from labour towards pollution and resources, phasing out environmentally harmful subsidies, promoting green public procurement and developing Public Private Partnerships. Also VAT discounts or other incentives to encourage use of recycled materials instead of raw materials in products could be explored.
- Building up the right infrastructures and sharing investment costs will be key to encourage firms to change their business model. To this end, it is important that the implementation of the circular economy builds upon clusters in order to maximize return of investment and reach economy of scale. In addition, public investment in infrastructure like eco-industrial

parks that can be used by several firms should increase. Lastly, sharing production platforms specialised in the circular economy should be encouraged via tax policy.

Europe should aim to become a global leader in re-using and refining resources, eco-design and waste treatment solutions

- The EU smart specialisation policy designed to boost regional innovation should be used to help Europe become a global leader in this area. Therefore, EU funds should support the transition and contribute to the deployment of such models.

CONCLUSIONS

This paper has shed light not only on the pivotal role that the manufacturing industry plays in our economy, but also on the difficulty Europe faces to maintain a strong industrial base. The diagnosis is shared by all relevant stakeholders but the current remedy is inconsistent and weak.

The mere focus on the contribution of manufacturing to GDP as well as a purely national approach will not be sufficient to address the challenge. Europe's success will rather depend on its capacity to act together and to shape its manufacturing activities in a strategic way in order to move up the value chain and to strengthen its comparative advantage over its main competitors. Developing a collaborative approach and making best use of EU strengths could reinforce the European value chain and benefit the European economy tremendously. This will have significant relevance for Europe as it will determine its future role in the global economy, its long-term growth, its ability to steer global competition and also the success of the European integration project. In this respect, the role of the EU is decisive. Existing EU instruments will have to be strengthened or further adapted and new ones should be created. Such a move needs however to be supported by all actors involved, including national authorities and the industry itself.

In order to move the debate on industrial policy forward, the paper proposes a toolkit for implementing a new EU strategic vision and a set of concrete actions. The scope of the toolkit illustrates what industrial policy should entail nowadays. This should reflect the complexity of the globalised economy and the complex set of factors leading to competitiveness. Industrial policy is not a one-off task, it is a cross-cutting policy requiring a comprehensive set of measures which need to be implemented in a coherent manner. The measures developed in the toolkit are therefore mutually reinforcing and should be regarded as a whole. Indeed, the failure to act in one field might have detrimental effects on others.

Two additional features in policy-making are needed by industry: consistency and flexibility. While consistency is crucial to provide industry with an investment friendly environment, flexibility is also required as comparative advantages evolve over time. Therefore, a delicate balance between the two has to be struck.

Lastly, the implementation of the new EU strategic vision suggested in this paper raises a number of questions, including the ones listed below:

- Industrial specialisation is likely to increase the vulnerability of territories to economic shocks, and countries and regions which are highly specialised will require support in case there is an industrial decline in their sector. What mechanisms and EU governance structure should be put in place to mitigate those risks? How to strike the right balance between sectoral specialisation and a diversified industrial base?

- What scale would be the most appropriate to apply the concept of circular economy in order to respond to the three equally important objectives of preserving manufacturing jobs, building-up a comparative advantage based on resource-efficient products and processes and maintaining Europe's strong participation in the GVC?
- Climbing up the value chain - currently a key objective of EU economies - will certainly help EU countries to derive the greatest benefit from the GVC. However, following this strategy will continue to accelerate the international labour division, which has a detrimental impact on Europe's low skilled labour. How will Europe address this adjustment cost and balance out its industrial strategy with employment policy?

Further research based on hard data, a better assessment of the impact of the GVC on European firms' competitiveness and learning more from firms' 'success stories' will be needed to answer these questions. Moreover, many of the recommendations made in this paper will require high quality monitoring at EU level. Robust monitoring mechanisms should be used as a tool to assess the evolution of the European value chain regularly, to identify its strengths and weaknesses and to benchmark the EU with the rest of the world.

Bibliography

EU Legislation

European Parliament and Council (1996), “concerning common rules for the internal market in electricity”, Directive (1996)92

European Parliament and Council (1998), “concerning common rules for the internal market in natural gas”, Directive (1998)30

European Parliament and Council (2003), “concerning common rules for the internal market in electricity and repealing Directive (1996)92”, Directive (2003)54

European Parliament and of the Council (2003) “concerning common rules for the internal market in natural gas”, Directive (2003)55

European Commission (2003), “Concerning the definition of micro, small and medium-sized enterprises”, Recommendation (2003)361

European Commission (2006), “Global Europe: Competing in the world – A contribution to the EU's Growth and Jobs Strategy”, COM (2006)567

European Commission (2007), “A European initiative for the development of micro-credit in support of growth and employment”, COM (2007)708

European Parliament and Council (2009) “concerning common rules for the internal market in electricity and repealing Directive (2003)54”, Directive (2009)72

European Parliament and Council (2009), “concerning common rules for the internal market in natural gas and repealing Directive (2003)55”, Directive (2009)73

European Commission (2009), “Preparing for our future: Developing a common strategy for key enabling technologies in the EU”, COM (2009)512/3

European Parliament and Council (2009), “establishing an Agency for the Cooperation of Energy Regulators”, Regulation (2009)713

European Parliament and Council (2009), “conditions for access to the network for cross-border exchanges in electricity and repealing Regulation (2003)1228”, Regulation (2009)714

European Parliament and Council (2009), “conditions for access to the natural gas transmission networks and repealing Regulation (2005)1775”, Regulation (2009)715

European Commission (2009), “Current situation of key enabling technologies in Europe”, European Commission Staff Working Document SEC (2009)1257

European Commission (2010), “Europe 2020 Flagship Initiative, Innovation Union”, COM (2010)546 final

European Commission (2010), “Regional Policy contributing to smart growth in Europe 2020”, COM (2010)553 final

European Commission (2010), “An Integrated Industrial Policy for the Globalisation Era - Putting Competitiveness and Sustainability at Centre Stage”, COM (2010)614

European Commission (2012), “A Stronger European Industry for Growth and Economic Recovery”, COM (2012)582 final

European Commission (2013), “State of the Innovation Union 2012; Accelerating change”, COM (2013)149 final

European Commission (2013), “European Competitiveness Report 2013, towards knowledge-driven reindustrialization”, European Commission Staff Working Document no. 347

European Parliament and Council (2013), “Laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund and repealing Council Regulation (EC) no 1083/2006”, Regulation (2013)1303

European Commission (2014), “For a European industrial renaissance”, COM (2014)14/2

European Commission (2014), “Energy prices and costs report”, European Commission Staff Working Document, SWD (2014) 20 final/2, p.197

European Commission (2014) “Energy prices and costs in Europe”, COM (2014) 21/2

European Commission (2014), “Towards a circular economy: A zero waste programme for Europe”, COM (2014)398

European Commission (2014), “Enabling SMEs to turn environmental challenges into business opportunities”, COM (2014)440

European Commission (2014), “An Integrated Industrial Policy for the Globalisation Era Putting Competitiveness and Sustainability at Centre Stage”, COM (2014)614

European Commission (2014), “Declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty”, Regulation (2014)651

European Commission (2014), “Progress in industrial competitiveness per EU country”, Memo 14/526, September

EU studies

EPRS (2014), “Reshoring of EU manufacturing”, *Briefing*, 21 March

European Commission brochure (2010): “Being wise with waste: the EU’s approach to waste management”

European Commission (2011), “Final report from the high level expert group on key enabling technologies”, June

European Commission (2011), “Final Report -June 2011”, High Level Expert Group on Key Enabling Technologies, June

European Commission (2012), “State of the Innovation Union Report 2012, Accelerating Change”

European Commission (2013), “Innovation Union Competitiveness Report 2013”, European Commission Staff Working Document

European Commission (2013), “Competing in Global Value Chains, EU Industrial Structure Report 2013”

European Commission (2013), “2013 SME’s Access to Finance Survey, Analytical Report”

European Commission (2013), “Energy challenges and policy”, *EC contribution to the European Council of 22 May 2013*

European Commission (2013), “European competitiveness report 2013 - Towards a knowledge-driven reindustrialisation”, European Commission Staff Working Document SWD (2013)347 final

European Commission (2013), “Trade, Growth and Jobs”, *EC contribution to the European Council, April*

European Commission (2014), “Helping Firms Grow, European Competitiveness Report 2014”, European Commission Staff Working Document SWD (2014)277 final

European Commission (2014), “Innovation Union Scoreboard 2014”

European Commission (2014) “Scoping study to identify potential circular economy actions, priority sectors, material flows and value chains”, *Final report, August*

European Commission (2014), Overview of Europe 2020 targets for the Member States’ on R&D

European Commission (2014), “Scoping study to identify potential circular economy actions, priority sectors, material flows and value chains”, *Final report, August*

European Commission (2014), “Energy economic developments in Europe”, DG Economic and Financial Affairs, *European Economy Series No. 1*

European Parliament (2014), “How can European industry contribute to growth and foster European competitiveness”, *Study for the ITRE Committee, August*

Articles and other relevant documents

ADB, OECD (2014), “Study on Enhancing Financial Accessibility for SMEs, Lessons from recent Crises”, Asian Development Bank, Manila, Philippines

Ahtonen A. and Chiorean-Sime S (2012), “Green revolution: making eco-efficiency a driver for growth”, *EPC Issue Paper no. 68*, Brussels

Aghion, P., Boulanger, J., Cohen, E. (2011), "Rethinking Industrial Policy", *Bruegel Policy Brief, Issue No. 04*, Brussels

Aghion P., Dewatripont M., Du L., Harrison A. Legros P. (2010), "Industrial policy and competition", *Harvard Working Paper*, April, Cambridge, US

Amador J., Cappariello R., Stehrer R. (2013), "Global value chains: A view from the euro area", *Paper presented at the CompNet Conference*, 16-17 April, Washington DC

Banque de France (2014), "Les marchés de la titrisation en Europe : caractéristiques et perspectives", No.31, Paris

BusinessEurope (2013), "A competitive EU energy and climate policy", June, Brussels

CEDEFOP (2010), "Skills supply and demand in Europe, Medium-term forecast up to 2020", Thessaloniki

CEPS (2010), "A new approach to innovation policy in the European Union innovation policy: Boosting EU competitiveness in a global economy", *CEPS Task Force Report*, Brussels

Cincera M., Ravet J., Veugelers R. 2014, R&D Financing constraints of young and old innovation leaders in the EU and the U.S., Solvay Brussels School, Université Libre de Bruxelles, *iCite Working Paper*, Brussels

Darvas Z. (2013), "Banking system soundness is the key to more SME financing", *Bruegel Policy Contribution, Issue no. 10*, Brussels

Dhéret C., Lazarowicz A., Nicoli F., Pascouau Y., Zuleeg F. (2013), "Making progress towards the completion of the Single European Labour Market", *EPC Issue Paper no. 75*, Brussels

Dhéret, C. (2014), "Sharing the same vision – The cornerstone of a new industrial policy for Europe", *EPC Discussion Paper*, European Policy Centre, Brussels

Di Mauro F., Hedwig P., Stehrer R. (2013), "Global value chains: A case for Europe to cheer up", *CompNet Policy Brief no. 03*, European Central Bank, Frankfurt am Main

ECVA, "2013 European Private Equity Activity, Statistics on Fundraising, Investments & Divestments", *ECVA Report*, May, Brussels

European Investment Fund (2013), "SME Report 2013"

Ellen MacArthur Foundation, "The circular economy applied to the automotive industry", Cowes, U.K.

EUROCHAMBRES (2013), "Reducing youth unemployment to the pre-crisis level by 2018: EUROCHAMBRES' submission to the 12th November Youth Employment Summit", November, Paris

Fleming T., Zils M. (2014), "Toward a circular economy: Philips CEO Frans van Houten", *McKinsey Quarterly*, February

Fontagné L., D'Isanto A. (2013), "Chaînes d'activité mondiales : des délocalisations d'abord vers l'Union européenne", *Insee première no. 1451*, June, Paris

Frontini, A. (2012), “Advancing a multi-level system of European commercial diplomacy: is there a role for the EU?”, *EPC Policy Brief*, September, Brussels

Geox (2012), “Annual Report”

Hall, Bronwyn H. (2013), “Is intellectual property important for future manufacturing activities?”, Foresight, Government office for science, *Report for the future of manufacturing project: Evidence paper 12*, London

Harrison, A., and Rodriguez-Clare, A. (2010), “From hard to soft industrial policies in developing countries”, VoxEU.org, available at <http://www.voxeu.org/article/hard-soft-industrial-policies-developing-countries>, Berkely, U.S.

High-level Expert Group on KETs (2014), European Commission, “KETs for a competitive Europe”

Hollanders H., Tarantola S. (2011) “Innovation Union Scoreboard 2010 - Methodology report”, January

Kraemer-Eis H., Lang F., Gvetadze S. (2014), “European Business Finance Outlook”, European Investment Fund, *Working Paper No. 24*, Luxembourg

Kraemer-Eis H., Passaris G., Tappi A. (2013), “SME Loan securitisation 2.0, Market assessment and policy options”, European Investment Fund, *Working Paper No. 19*, Luxembourg

Manyika J., Sinclair J., Dobbs R., Strube G., Rasse L., Mischke J., Remes J., Roxburburgh C., George K., O’Halloran, Ramaswamy S. (2012), “Manufacturing the future: the next era of global growth and Innovation”, McKinsey Global Institute

Naudé, W. (2010), “Industrial Policy – Old and New Issues”, United Nations University, World Institute for Development Economics and Research, September, Helsinki

Nguyen H., Stuchtey M., Zils M. (2014), “Remaking the industrial economy”, *McKinsey Quarterly*, February

Nunez Ferrer J., Volkery A., Withana S. et al. (2012), “The use of innovative financial instruments for financing, EU policies and objectives implications for EU and national budgets”, *CEPS Special Report, no. 68*, Brussels

Oakdene Hollins (2011), “Further Benefits of Business Resource Efficiency”, *Final Report*, UK Department of the Environment, Food and Rural Affairs, March, London

OECD (2013) “Innovation-driven Growth in Regions: The Role of Smart Specialisation”, *OECD Publications*, Paris

OECD (2013), “Interconnected economies: Benefiting from global value chains – Synthesis report”, *OECD Publications*, Paris

OECD, WTO, World Bank Group (2014), “Global Value Chains: Challenges, opportunities and implication for policy”, *Report prepared for submission to the G20 Trade Ministers Meeting Sydney, Australia, 19 July 2014*

- Owen G. (2012) "Industrial policy in Europe since the Second World War: what has been learnt?", *ECIPE Occasional paper* No. 1, Brussels
- Pelly R., Kraemer-Eis H. (2012), "Improving the funding landscape for entrepreneurs", in "SMEs in the Single Market. A growth agenda for the 21st century", *Lisbon Council Policy Brief, Vol. VI, no. 3*, p.12-15, Brussels
- Pollin R. (2010), "Industrial Policy and the Revival of the U.S. Economy", *Commentary*, Political Economy Research Institute, Massachusetts Amherst, January
- Porter M. (1990), "The competitive advantage of nations", *Harvard Business Review*, March/April, Cambridge, U.S.
- Roland Berger Strategy Consultants (2012), "Innovation - How the emerging markets are driving the global innovation agenda", Global Topic Initiative, Munich
- Sala-I-Martin X., Bilbao-Osorio B., Di Battista A., Drzeniek Hanouz M., Galvan C., Geiger T. (2014), "The Global Competitiveness Index 2014-2015: Accelerating a robust recovery to create productive jobs and support inclusive growth", World Economic Forum, Geneva
- USGS Fact Sheet (2001), "Obsolete Computers, 'Gold Mine', or High-Tech Trash? Resource Recovery from Recycling", *U.S. Geological Survey*, U.S. Department of the Interior
- Vanden Bosch, X. (2014), "Industrial policy in the EU: A guide to an elusive concept", Academia Press, *Egmont Paper 69*, Brussels
- Van Noorden R. (2014), "China tops Europe in R&D intensity", *Nature*, Vol. 505
- Veugelers R. (2013), "Manufacturing Europe's growth", Volume XIII, *Bruegel blueprint series*, Bruegel, Brussels
- Vieweg H. G. (2012), "An introduction to mechanical engineering: Study on the competitiveness of the EU mechanical engineering industry", within the framework contract of sectoral competitiveness studies-ENTR/O6/054, *Final report*, Munich
- Warwick K. (2013), "Beyond Industrial Policy, Emerging issues and new trends", *OECD Science Technology and Industrial Policy Papers*, OECD, Paris
- World Economic Forum, in collaboration Ellen MacArthur Foundation and McKinsey & Company (2014) "Towards the circular economy - Accelerating the scale-up across global supply chains", *2014 Report*, January, Geneva
- World Intellectual Property Organisation, WIPO "IP Asset Development and Management: A key strategy for economic growth", *WIPO Publication no. 896E*, Geneva
- Zadeh R. M. (2007), "Cluster Development and Initiatives in Traditional Industries", *Paper for International Cluster Conference: Patterns of Clusters Evolution*, Yorkshire Forward, Brussels
- Zuleeg F. (2013), "Squaring the circle – A European Investment Guarantee Scheme (EIGS)", *EPC Commentary*, Brussels

Articles from the press

ECB Press Release (2014), “*ECB announces monetary policy measures to enhance the functioning of the monetary policy transmission mechanism*”, 5 June, available at:

http://www.ecb.europa.eu/press/pr/date/2014/html/pr140605_2.en.html

ECB Press Release (2014) “*ECB allots €82.6 billion in first targeted longer-term refinancing operation*”, 18 September, available at: http://www.ecb.europa.eu/press/pr/date/2014/html/pr140918_1.en.html

ECB Press Release (2014), “*ECB announces operational details of asset-backed securities and covered bond purchase programme*”, 2 October, available at:

https://www.ecb.europa.eu/press/pr/date/2014/html/pr141002_1.en.html

European Commission (2014) “*EC calls for immediate action for a European Industrial Renaissance*”, Press Release IP/14/42, 22 January, available at: http://europa.eu/rapid/press-release_IP-14-42_en.htm

European Commission (2014), “*Progress in industrial competitiveness per EU country*”, Memo 14/526, 11 September, available at: http://europa.eu/rapid/press-release_MEMO-14-526_en.htm

“*Les deux facettes de la conception traditionnelle*”, Melchior.fr, available at: <http://www.melchior.fr/Les-deux-facettes-de-la-concep.3319.0.html>

“*Le gouvernement français veut soutenir la titrisation*”, Euractiv, 16 September 2014, available at: <http://www.euractiv.fr/sections/euro-finances/le-gouvernement-francais-veut-soutenir-la-titrisation-308467>

“*The long arm of the state*”, The Economist, 23 June 2011, available at: <http://www.economist.com/node/18832034>

“*Vers une industrie moins... industrielle ?*”, La lettre du CEPII (2014), February, Paris, available at: http://www.cepii.fr/PDF_PUB/lettre/2014/let341.pdf

“*War is declared between Montebourg and Almunia*”, Euractiv, 27 January 2014, available at: www.euractiv.com/trade/war-french-minister-eu-competiti-news-533012

Websites

BPI France, available at: <http://www.bpifrance.fr/Bpifrance/Notre-mission>

Cefic (2011), “*Skills for innovation in the European chemical industry*”, available at: <http://www.cefic.org/Documents/PolicyCentre/Skills-for-Innovation-in-the-European-Chemical-Industry.pdf>

DG Trade, European Commission, available at: <http://ec.europa.eu/trade/policy/accessing-markets/goods-and-services/raw-materials/>

NACE website, available at:

http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Manufacturing_statistics_-_NACE_Rev._2

European Alliance for Apprenticeships, available at: http://ec.europa.eu/education/policy/vocational-policy/alliance_en.htm

European Progress Microfinance Facility, available at: http://www.eif.org/what_we_do/microfinance/progress/

European Research Area, available at: http://ec.europa.eu/research/era/index_en.htm

Global Competitiveness Index, World Economic Forum, available at: <http://www.weforum.org/issues/global-competitiveness;>

Horizon 2020, The EU Framework Programme for Research and Innovation, available at: <http://ec.europa.eu/programmes/horizon2020/>

Innovation Union, 2020 strategy, available at: http://ec.europa.eu/research/innovation-union/index_en.cfm

Interview with Cohen, E. (2014), “La France doit changer de modèle économique”, 15 April, Xerfi Canal, available at: http://www.xerficanal-economie.com/emission/Elie-Cohen-La-France-doit-changer-de-modele-economique_1522.html

Interview to the French Minister Arnaud Montebourg about its ‘re-shoring campaign’, available at: http://www.dailymotion.com/video/x120f6k_jt-12-13-de-france-3-centre-sur-la-fonderie-loiselet-16-07-2013_news

Market Access Database, available at: <http://madb.europa.eu/madb/indexPubli.htm>

Missions for Growth, available at: <http://ec.europa.eu/enterprise/initiatives/mission-growth/missions-for-growth/>

Orkli, <http://www.orkli.es/in/empresa/home.html>

Science Daily (2009), “Set World Standards For Electronics Recycling, Reuse To Curb E-waste Exports To Developing Countries, Experts Urge”, 17 September, available at: <http://www.sciencedaily.com/releases/2009/09/090915140919.htm>

SMEs and access to finance Index, European Commission, DG Enterprise and industry, available at: http://ec.europa.eu/enterprise/policies/finance/data/enterprise-finance-index/sme-access-to-finance-index/index_en.htm

World Intellectual Property Organization, available at : <http://www.wipo.int/portal/en/index.html>

Annex 1

List of meetings of the EPC Industrial Policy Task Force - 2013-2014

- **13 September 2013**
Access to finance: how to restore the investment capacity of the industry?
- **25 October 2013**
Innovation Policy: A pre-condition for re-industrialising Europe - Task Force meeting
- **13 November 2013**
Towards a knowledge-driven re-industrialisation: what impact on skills and human capital?
- **10 December 2013**
The external dimension of industrial policy
- **11 February 2014**
The role of the state in boosting the competitiveness of industries - What challenges and opportunities?
- **11 March 2014**
The process of offshoring-reshoring: what impact on jobs and the value chain?
- **14 May 2014**
What future for European industrial policy? Three possible scenarios.
- **9 July 2014**
The EU industrial policy: what ideal scenario for its future?

Annex 2

List of figures

- Figure 1** Production and employment in EU manufacturing 2000-2014
- Figure 2** EU, Chinese and US shares of world manufacturing production value, 2004-2012
- Figure 3** EU, Chinese and US shares of world manufacturing value added, 2004-2011
- Figure 4** Top manufacturers by share of global nominal manufacturing gross value added
- Figure 5** Share in EU manufacturing by Member State (% of total)
- Figure 6** Manufacturing recovery by Member State 2008 – 2014
- Figure 7** Apparent labour productivity in manufacturing (by NACE rev. 2) by Member State, 2011
- Figure 8** SMAF index, EU Member States, 2012
- Figure 9** Investment and research excellence
- Figure 10** EU Member States' innovation performance
- Figure 11** A toolkit for implementing a new vision
- Figure 12** Trends in patent applications at the major patent offices
- Figure 13** SME Business Climate Index
- Figure 14** Share of foreign value added (in exports) by origin – 2011 (percentages)
- Figure 15** Evolution of real energy prices in the manufacturing sector (1995-2009)
- Figure 16** The share of energy costs in production costs in energy intensive industries
- Figure 17** Industrial electricity prices in the EU by customer size (July – Dec. 2011)

List of concrete examples

- Box 1** Intellectual Property Rights (IPR) – A regulatory instrument to fostering industry's development
- Box 2** The benefits of a comprehensive qualification strategy - The example of the Institute for Economic Promotion (WIFI) of the Austrian Federal Economic Chamber
- Box 3** Educate to Innovate - The European Technology Platform for Sustainable Chemistry (SusChem)
- Box 4** A robust eco-system –A key driver for machine tool industry's competitiveness
- Box 5** The industry-led interregional cooperation in Scotland
- Box 6** How to move towards the Europeanisation of the value chain in strategic sectors – The example of Finmeccanica
- Box 7** The contribution of EUROCHAMBRES to the creation of a European Economic Diplomacy and its benefits for European business
- Box 8** The key role of innovation in addressing current challenges – The example of Phase Change Materials in the chemistry industry
- Box 9** A Scheme for Young Innovative Companies – A French example
- Box 10** The implementation of the circular economy model in the automotive industry

Annex 3

Country abbreviations

AT	Austria
BE	Belgium
BG	Bulgaria
CY	Cyprus
CZ	Czech Republic
DE	Germany
DK	Denmark
EE	Estonia
EL	Greece
ES	Spain
FI	Finland
FR	France
HR	Croatia
HU	Ireland
IE	Hungary
IT	Italy
LT	Lithuania
LU	Luxembourg
LV	Latvia
MT	Malta
NL	The Netherlands
PL	Poland
PT	Portugal
RO	Romania
SE	Sweden
SI	Slovenia
SK	Slovakia
UK	United Kingdom