

### MAIN FINDINGS OF THIS REPORT:

- As EU manufacturing emerges from the recession, its competitive strengths remain intact: highly skilled workers, high domestic content of export goods, and comparative advantages linked to complex and high-quality product segments.
- The fall in recent years in the value-added share of manufacturing is due mainly to falling relative prices of manufacturing in relation to services, which in turn stem from higher productivity growth. Discounting for the relative price effect, the actual fall has been much more gradual. On the other hand, the positive impact of reindustrialisation on the value-added share may not be strong enough to outweigh the opposite effect of falling relative prices.
- Otherwise viable projects appear to be held back by financial markets imperfections. Smaller and younger firms are especially affected and policy measures to improve their access to external financing may be justified.
- Smaller and younger firms are also less likely to enter foreign markets. Most internationalisation strategies by SMEs are focused primarily on exports and driven by factors in their home country and in the target country.
- The efficiency of public administration has an impact on the growth of firms, both in terms of employment and the share of high-growth firms. There are, however, only weak indications that public administration plays an important role as an input to different sectors of the economy.
- Product innovation has a positive and large effect on employment growth in all phases of the business cycle, in both manufacturing and service sectors. The effects of process and organisational innovations on employment growth are smaller and often statistically insignificant. The absolute effect of product innovation is largest in boom periods, which are characterised by high demand. However, in recessions, it plays a very important employment-preserving role.
- Electricity and gas prices are higher, and have recently risen more, in the EU than a number of other economies, mainly due to rising taxes, levies and network costs.
- Econometric analysis shows that, for several manufacturing industries, energy efficiency improvements have not fully offset the negative impact of increasing energy prices, even though European industries have achieved more than international competitors in reducing their energy intensity.
- Increasing electricity costs had a negative impact on export competitiveness. The impact can be particularly challenging for certain energy-intensive industries in the EU.

## ***Post-recession fallout: manufacturing's strengths and challenges***

### ***Building on existing strengths...***

As the economy emerges slowly from the longest and deepest recession in EU history, it is important to build on the existing strengths of EU manufacturing going forward. First, EU exporters have comparative advantages in a number of manufacturing sectors, including those characterised by high technology intensity, such as pharmaceutical products, and by medium-high technology intensity, such as chemical products, machinery and equipment, motor vehicles and other transport equipment. Similarly, in value added terms, the EU has great advantages in chemical products, machinery and transport equipment, but also in metal products, wood and wood products, paper, printing and recorded media.

Secondly, the domestic content of EU manufacturing exports is high — around 85% of value added — and comparable to the domestic content of Japanese or US manufacturing exports. The domestic content of Chinese and South Korean exports is much lower, as their export goods include much more foreign embedded value added, of which more than 5% is of EU origin.

Thirdly, EU manufacturing exports are characterised by a higher degree of sophistication and complexity than goods exported by many other economies, and from 1995 to 2010 all accession countries of 2004/2007 managed to raise the complexity of their exports.

Fourthly, EU manufacturing is characterised by a growing share of high-skilled workers carrying out advanced and often specialised tasks.

### ***...but challenges remain***

At the same time, many challenges lie ahead and the EU economy is still far from reaching its targets for manufacturing value added, R&D expenditure, gross fixed capital formation and investment in machinery and equipment. This report shows that the increasing distance to the 20% reindustrialisation is primarily the result of higher productivity growth in manufacturing than in the rest of the economy, which in turn pushes the relative price of manufactured goods down in relation to services, and thereby the value-added share of manufacturing. Net of the relative price effect, the fall in the value-added share is much smaller.

## ***Focus on firm growth***

### ***Structure of the report***

With the recession now behind them in most Member States, EU firms can look forward and have a chance to prosper and grow — as will the many start-up firms not yet in existence. Because the growth of firms (in terms of employees, turnover, profitability, or market shares) is now of crucial importance, four chapters of this report are dedicated to various factors and drivers thereof such as access to finance (Chapter 2); SME internationalisation (Chapter 3); the efficiency of public administration (Chapter 4); growth of firms, innovation, and the business cycle (Chapter 5). Energy costs and energy efficiency — at least as crucial to EU competitiveness — are addressed in Chapter 6.

### *Financial market imperfections may hold back otherwise viable projects*

*External financing is crucial for firms to grow...*

Europe's economic success depends on the competitiveness and growth of European enterprises. Access to external financing is essential for enterprises to invest, innovate and grow. As a consequence of financial market imperfections, for example caused by *information asymmetries*, 'financing gaps' may limit enterprises' investment and growth options if viable projects cannot be financed. Since 2008, the proportion of successful bank loan applications has fallen significantly, along with the level of enterprise investment. While the sharp fall in private sector investment is largely a consequence of weak demand, financial market imperfections may have also played a role.

The results of an econometric analysis of ECB survey data and EU firm accounts, from the Amadeus and EFIGE datasets, indicate that the difficulties that small and young firms have in obtaining external finance cannot be linked entirely to risk. Small and young firms have more difficulty than other firms in obtaining bank credit, even if their financial performance is the same. This indicates that the market for bank credit is not functioning efficiently. The financial market imperfections most likely stem primarily from information asymmetries. On the one hand, banks may not have sufficient financial information on firms who want to borrow, which discourages them from lending. On the other hand, firms may not have sufficient knowledge of potential lenders or may be discouraged from borrowing due to a belief that banks will not lend to them, and so may miss out on borrowing opportunities.

External finance has an effect on the growth of firms by providing resources to support investment, productivity, employment and expansion into international markets. The results of an econometric analysis of firm accounts from the Amadeus database indicate that lending is more important for small and young firms seeking to finance new investment than for other types of firm. However, as noted above, small and young firms find it more difficult to obtain loans. Also, they are more sensitive than other types of firm to the interest burden on loans. Because young firms, in particular, have difficulty obtaining long-term credit, they are being driven to accept shorter-term credit arrangements, which are unsuitable for funding long-term investment projects.

*...and for job creation*

Long-term credit is very important to all firms' moves to take on new staff, but most crucial for domestically-owned small and medium-sized enterprises (SMEs) and very small (micro) firms seeking to expand their workforce. In general, for young firms there is a strong positive relationship between increased cash flows and total factor productivity (TFP). In terms of enabling new employment, the high-tech knowledge-intensive services sector is more reliant on external finance than other sectors.

Firms that are less financially constrained are more likely to export, possibly because they have the available funds to overcome the sunk costs of entry into export markets. However, financial constraints do not affect the export sales (intensity) of firms that are already exporting. Access to external finance is more important as a driver of new investment for manufacturing

and construction sectors than for services.

### ***Measures to improve supply of and demand for external financing***

On the side of lenders, information asymmetries could be addressed by standardising financial information on SMEs, for example through the establishment of centralised credit rating agencies at national or EU level. These could be used as a source of reference by all banks, similar in purpose to the credit ratings issued on government, municipal and corporate debt. On the side of borrowers, policy measures should be introduced that boost the market knowledge of small and young enterprises, as well as training in the preparation of loan proposals.

While current policy measures focus on supporting existing exporters, specific support measures may be needed to enable export participation of SMEs, possibly in the form of export credits and insurance, or other measures. To answer these questions the report dedicates a chapter on the link between internationalization and growth of firms.

### ***SMEs entering foreign markets***

***Exporting is most common way for SMEs to go international***

Policymakers are increasingly focusing on the growth and employment potential of SMEs. Comprising over 99% of all firms and 60% of total output in the EU, SMEs are central to efforts to improve long-run competitiveness, particularly in international markets, where historically they have underperformed as compared with larger firms.

SMEs tend to enter foreign markets primarily as exporters because of the lower levels of capital investment and associated risk. Foreign direct investment is another form of internationalisation, although this is less common among SMEs than larger firms. Other forms, such as non-equity contractual modes, are relatively uncommon in manufacturing and business services. Franchising and licensing are important foreign entry modes in the retail, accommodation and restaurant sectors, where exports play a less significant role.

***Strategies depend on firm and country characteristics***

Not all SMEs have the same opportunities to internationalise their production activities. Internationalisation strategies differ according to inherent firm characteristics such as initial productivity, skill intensity, innovation performance and management characteristics. The factors influencing their internationalisation decisions can be divided into two categories: internal and firm-specific factors, or external factors. The former include firm size, labour productivity, skill intensity, innovation activities, and foreign ownership. The latter consist of home-country characteristics such as export promotion programmes, administrative and transport costs associated with exporting, and host-country characteristics such as tariffs, regulations, political risk factors, geographical distance and cultural factors.

### ***Patterns and drivers of SME internationalisation***

The report presents in chapter 3 SME internationalisation patterns, highlighting key trends and their impact on the growth of firms. It distinguishes between SME size classes (small, medium and micro

enterprises), internationalisation modes (exporting and outward FDI activity), types of exports (goods and/or services) and activity sectors (services and key manufacturing sectors). Some of the key findings include variations in SME export propensity, with higher participation rates in manufacturing and in software and business services, and the influence of home-country administrative burdens, such as heavier export and business regulations, leading to lower SME export participation rates. In broad terms, SME export participation increases with size and age of the firm, apart from some exceptions in technology-driven sectors, and is also positively linked to levels of innovation, R&D activity and skill intensity. Target country factors, including market size, language and geographical distance, also have a significant influence on SME internationalisation activity, particularly for the smallest firms, which are the most susceptible. In terms of technological considerations, skill-intensive SMEs have higher output and employment growth rates than those with a less skilled workforce, while overall there is a strong link between innovative SMEs and levels of export participation.

***An efficient public administration is an important driver of competitiveness***

It is becoming widely accepted in the EU that efficient public administration (PA) is a key driver of EU competitiveness. The demand for more efficient PA in the Member States has created a need for empirical evidence in addition to ‘business perceptions’, which are currently the only available form of feedback on the link between PA efficiency and business performance. While the need for more efficient PA can be supported empirically, assessing PA efficiency via microeconomic channels, with a view to providing ‘hard evidence’, is much more challenging. The report is identifying indicators of PA efficiency that can be related to the distribution of firms’ growth, the share of high-growth firms and the turnover of firms in an economy.

***An efficient public administration increases the share of high-growth firms and job creation***

The results show that greater PA efficiency induces higher rates of fast-growing firms, in particular by increasing firm turnover and net entry. This holds especially for general indicators that measure the overall governance system, including the presence of an independent judiciary and freedom from corruption. From this perspective, PA efficiency is tied to the quality of a country’s institutions and general (including political) governance.

***Tax administration corruption and ineffective justice systems seem to impede most firms’ growth***

Employing input-output analysis the reports finds in chapter four evidence that public service provision that relies more on fees than on taxes may be associated with higher efficiency.

Empirical results of a within-country analysis, presented in the chapter show that tax administration, corruption and ineffective justice systems are seen as the factors that most impede firms’ growth in virtually all countries in the sample.

### ***Impact of innovation on growth of employment***

Innovation can have different, contrasting effects on employment: it can create jobs by creating additional demand for new products, but it can also destroy jobs because of productivity effects and lower demand for old products. It is likely that the extent to which innovation can stimulate demand and the extent to which process innovations are used to reduce costs vary over the course of the business cycle, with important implications for employment. Chapter 5 studies how the relationship between innovation and employment growth changes over various phases of the business cycle and how this relationship is affected by different firms' characteristics. It uses data from the Community Innovation Survey, and it covers a large sample of firms in 26 European countries, in manufacturing and services sectors, for the period 1998-2010, which includes the recent economic crisis.

The chapter provides evidence that innovative firms have higher employment growth than non-innovative firms. This pattern can be observed in all sectors and in all phases of the business cycle, but is particularly pronounced in downturn and recession periods.

#### ***Impact of different types of innovation***

The results of econometric estimations suggest that product innovation has a positive and large effect on employment growth in all phases of the business cycle, in both manufacturing and service sectors. In most cases, a 1% increase in successful product innovation leads to a 1% gross increase in employment. The effects of process and organisational innovation on employment growth are smaller and often statistically insignificant.

The contribution of product innovation to employment growth is largest during boom periods, when favourable economic conditions lead to higher sales of new products. However, in recessions, product innovation plays a very important employment-preserving role. Employment losses of product innovators are much smaller than those of firms that did not introduce product innovations.

Firm size, sector and ownership structure are important determinants of the strength of the effects of product innovation. Product innovation has a much more profound effect on employment growth in high-technology and knowledge-intensive sectors than in low-technology and less knowledge-intensive sectors. The results also suggest that product innovation tends to contribute more to employment growth in large and foreign-owned firms, compared to SMEs and domestic firms. However, large and foreign firms tend to lose more employment due to higher productivity effects than they gain from product innovation, thus leading to mostly jobless growth.

The findings of the report indicate that innovation, and especially product innovation, contributes to increasing and to preserving employment in all phases of the business cycle and in all sectors. They also suggest that innovation is particularly important during recessions, when it plays an important role in limiting job losses.

The findings underline the importance of innovation support as a policy priority during all phases of the business cycle, but particularly in times of

crisis when firms tend to decrease investment in innovation due to fears that demand will grow more slowly, or not at all. The finding that product innovation plays an important role in stabilising employment growth during recessions supports the view that investment in R&D could be a candidate for smart fiscal consolidation.

### ***Energy cost has a significant impact on industrial competitiveness***

#### ***Rising energy costs put pressure on energy-intensive industries***

Electricity and gas prices have grown more in the EU than in many other economies. Although energy cost shares are slightly less than 5% of gross output in advanced economies such as the EU, Japan and the US, they have been generally increasing over time. For energy-intensive sectors energy cost shares are a fundamental determinant of competitiveness.

In terms of energy intensity, a strong convergence process has taken place across major economies, particularly in Europe where Member States have been able to reduce their energy intensities. This has been driven mostly by technology, but a structural shift towards high-tech industries has also played a role, particularly in the EU-12 countries. By contrast, in the EU-15 a structural shift towards chemicals and chemical products has limited the reduction in energy intensity.

#### ***Higher gas and electricity prices in the EU***

End-user gas and electricity prices for industry vary considerably across countries. In the case of natural gas, this reflects the regional fragmentation of wholesale markets, the differences in wholesale gas pricing formulas and varying degrees of end-user price regulation.

In the United States, gas prices are largely independent of the oil markets and tend to be much lower. The recent shale gas ‘revolution’ and the high degree of pass-through have also contributed to keeping industrial prices at around a quarter of the OECD-Europe average. Elsewhere, the cross-country differences in end-user gas prices can be largely attributed to varying degrees of price regulation. In Russia, low gas prices for industry are explained by end-user price regulation and cross-subsidisation of domestic customers at the expense of foreign shipments. Gas prices for industry in China vary widely by region, but on average they are broadly in line with the European level. In Japan, gas prices for industry are currently among the highest in the world, due not only to high upstream prices but also to cross-subsidisation of households by industry.

Due to taxation and exemptions, electricity prices in the EU differ not only between wholesale and retail but also between sectors and Member States. On average they are currently twice as high as those in the US. Network costs and electricity taxation and levies have contributed significantly to strong electricity price growth in Europe. At the same time, energy costs have decreased in some Member States thanks to the expansion of renewable energy production, since the variable costs of renewable electricity are negligibly low. There are also substantial differences across Member States, reflecting differences in the energy generation mix, in taxation and in the allocation of the cost of support for renewables, including the exemptions from such costs for many industrial sectors.

*Energy efficiency cannot fully offset the impact of price rises*

Unless they are offset by improvements in energy intensity, cross-country differences in energy prices may have important repercussions for production costs as well as industrial competitiveness. For this reason, the report estimates the price elasticity of energy intensity, i.e. how the energy intensities of individual industries responded to energy price shocks in the period from 1995 to 2009. The estimated elasticities are generally negative and not negligible, but their absolute value is smaller than one for most manufacturing sectors, implying that energy efficiency improvements in response to energy price shocks have generally not been sufficient to fully offset the adverse impact of rising energy prices, resulting in an overall increase of energy-related expenditure.

*Growing electricity costs have negative impact on export competitiveness especially for some energy-intensive industries*

The report investigates the link between energy prices, energy efficiency and industrial competitiveness (as measured by extra-EU exports). The findings show that the increasing electricity costs had a negative impact on export competitiveness. Moreover, the high heterogeneity within sectors suggests that energy-intensive industries are most heavily affected.

The results show that, since energy savings in most cases were not large enough to fully compensate for energy price increases, energy represents a growing share of total production costs. Therefore caution is called for when adopting policies that determine a further increase of energy prices, since this creates a real burden that some European firms cannot fully compensate for.