



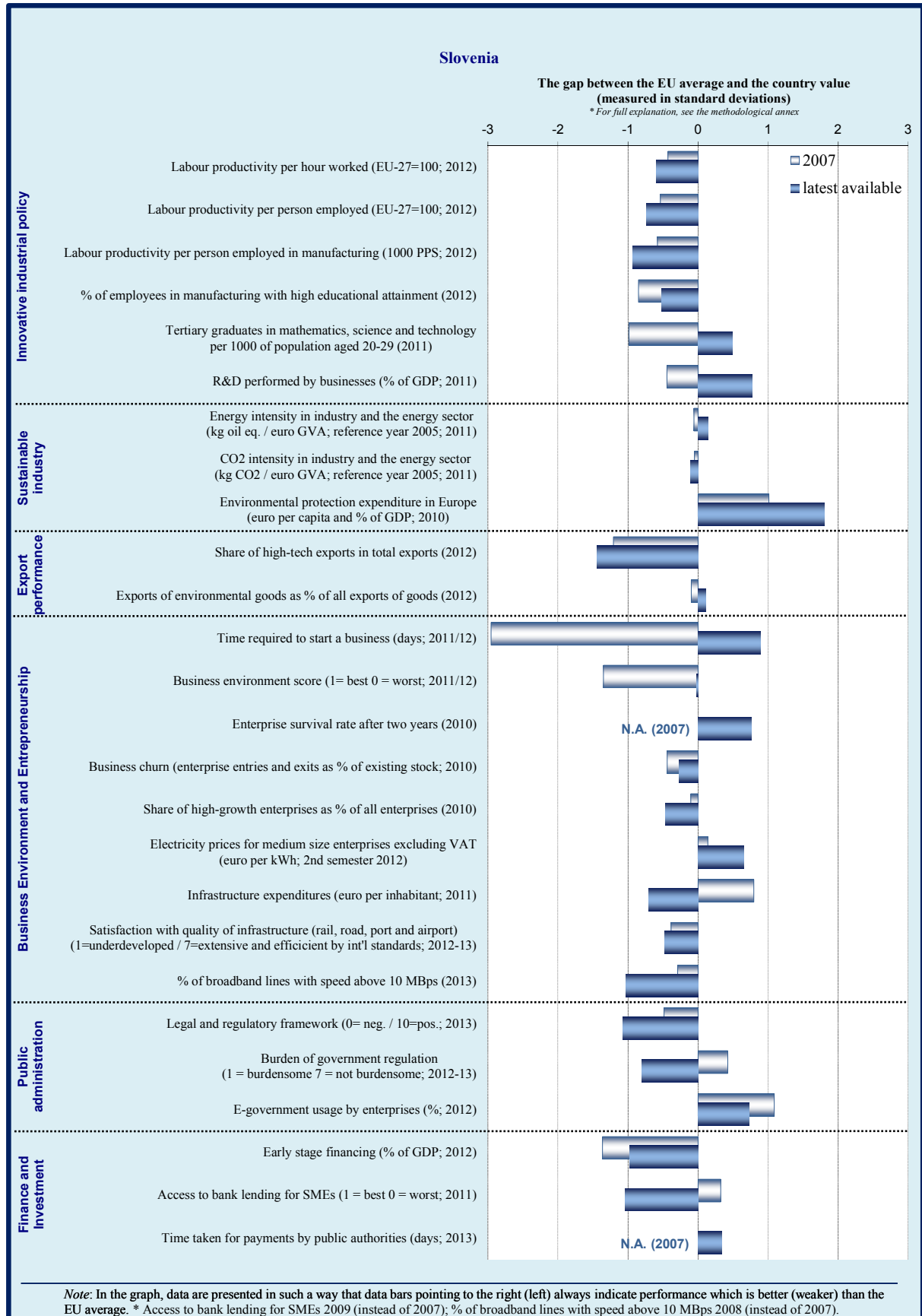
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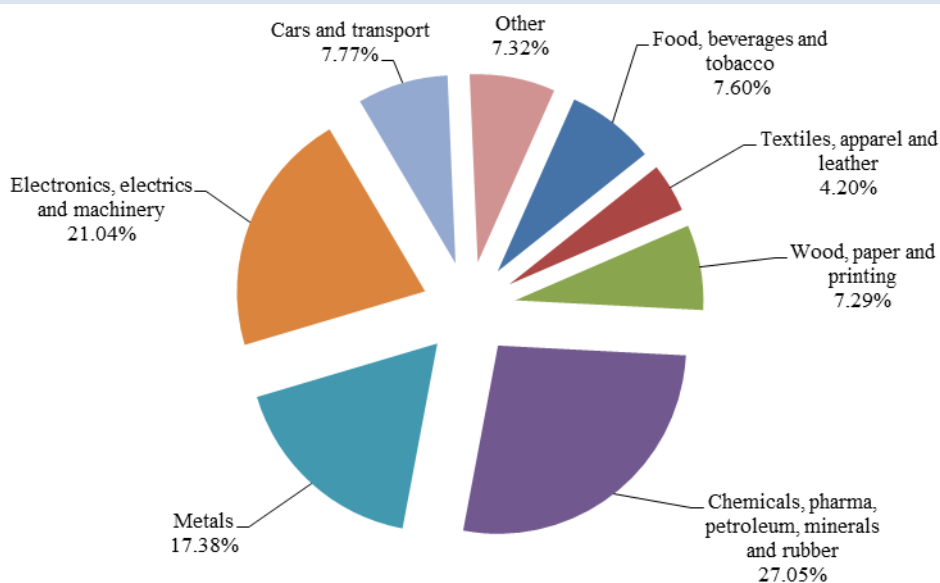
Volume 4/4

**COMMISSION STAFF WORKING DOCUMENT**

**Member States Competitiveness Performance and Implementation of EU Industrial  
Policy**

## 4.24. Slovenia



**Figure 5.1: Manufacturing sectors – Slovenia (2010)**

*Note:* No data available for sectors C19 (manufacture of coke and refined petroleum products) and C30 (manufacture of other transport equipment)

*Source:* Eurostat

#### 4.24.1 Introduction

Slovenia has slipped back into recession as its real GDP declined by 2.3% in 2012 and is projected to drop further by 2% in 2013.<sup>1</sup> Construction, the second biggest sector after manufacturing, was the hardest hit with a cumulative decline of 60% over the last four years.<sup>2</sup> The year 2012 was also marked by falling investment and domestic consumption together with stagnant exports (+0.3%). Stabilisation is expected to come only in 2014.<sup>3</sup>

Notwithstanding wage moderation, declining productivity prevented cost competitiveness from improving in 2012. Other key challenges are the unprecedented credit crunch, the low foreign direct investment stock and weak export performance.

The manufacturing sector was a larger part of the economy in 2011 (20.3%) than in the EU on average (15.5%). Slovenia's manufacturing industries are moving towards higher research intensity in almost all sectors.

Labour productivity is below the EU average, which is the result of many factors. Strict employment protection legislation has hindered the

re-allocation of labour across firms and sectors; many are employed in state-owned enterprises with low productivity; productivity-enhancing foreign direct investment flows are low; and there is a labour skill mismatch.

#### 4.24.2 Innovation, skills and sustainability

##### *Innovation*

The role of innovation in industrial policy is outlined in three strategic documents,<sup>4</sup> with the goal of increasing productivity and focusing on environmental technologies, sustainable mobility, biotechnology, technology solutions for health and ageing, and key enabling technologies.

Currently there is no active cluster policy, although some clusters that were supported earlier continue, the most important being in the automotive sector. Support is now focused on networking, clustering and collaboration between companies and knowledge institutions, in particular through eight centres of excellence, seven competence centres and 17 development centres. All are co-funded with structural funds, the first two types until the end of

<sup>1</sup> Commission SWD: Assessment of the 2013 national reform programme and stability programme for Slovenia.

<sup>2</sup> Source: IMAD, Slovenian economic mirror, February 2013, p. 10.

<sup>3</sup> Source: EC Spring Forecast 2013.

<sup>4</sup> 'The Research and Innovation Strategy', the 'National Higher Education Programme' and the 'Slovenian Industrial Policy 2014-20' (adopted on 6 February 2013).

2013, and the development centres until the end of 2015.

The country has implemented several measures to stimulate innovation, including a new research voucher (EUR 8 million) to help enterprises to commission research work from research and higher education institutions for a period of two years. New creative centres (EUR 4 million) were also created in 2012, with the aim of enhancing cooperation between academia and enterprises in different regions. R&D capacities of firms have been strengthened as over 140 companies were supported for a total of EUR 30.5 million, and more than 815 research experts were financed. The R&D tax subsidy has been increased to 100% and loans from SID Bank for R&D investment by businesses have been expanded (EUR 150 million). The Slovenian enterprise fund has offered guarantees for bank loans with a favourable interest rate for innovative projects undertaken by SMEs (EUR 50 million). Measures to encourage innovation and entrepreneurial investment in research (the estimated value of the co-financing in 2013-14 is approximately EUR 136 million) include the co-financing of development activities and technological investments and the purchase of technological equipment. Further, hiring of researchers is supported, as is the strengthening of research in firms, and investments made in the priority areas of smart specialisation.

Slovenia is an innovation follower<sup>5</sup> with performance below but close to the EU average. In this group the country performs well. However, in order to preserve its relative performance, it has to overcome some specific hurdles. Although R&D intensity increased from 1.66% in 2008 to 2.47% in 2011 (sixth place in the EU), the public contribution decreased, which may jeopardise the attainment of the 3% R&D intensity target by 2020, and it is one of the challenges that need to be managed.

The challenge is to ensure that R&D policies are consistent and coordinated, and that they are implemented properly. This includes the efficient use of available resources, including from the European Regional Development Fund. Improved governance and clear prioritisation are essential, in particular as efficiency gains are likely to be available in properly implementing these policies.<sup>6</sup>

## *Skills*

The tertiary and vocational education systems are insufficiently geared towards meeting emerging labour market needs. This is also reflected in the low percentage of people with high qualifications employed in manufacturing.<sup>7</sup> The Commission has proposed improvements in the vocational training system, better cooperation with stakeholders and better labour market need assessment. Improving competitiveness would require a better level of basic skills, and preserving investment in education and training even under budgetary restraints.<sup>8</sup>

The recently adopted labour market reform aims to tackle the duality of the labour market and to increase labour market flexibility, including through labour guidance. The reform reduces the protection of workers under permanent contracts by simplifying dismissal procedures and increases the protection afforded by temporary contracts. While the reform goes in the right direction, it remains to be seen how effective it will be.

## *Sustainability*

Slovenia's geographical location gives it an important role in transit, which increases the importance of energy and transport infrastructure. Both could be further improved. There is a need to develop the electricity network and meet the needs of increasing electricity transit flows. Slovenia has improved its gas connection with Austria and Croatia, while a gas connection with Hungary is under consideration. The apparent lack of administrative capacity to prepare a comprehensive transport strategy contributes to the underdevelopment of the railway infrastructure.

Slovenia also needs to speed up implementing EU Energy legislation, mainly the third energy package. At the same time an opening of its gas and energy market is a precondition for making the energy market more competitive. Consumers would benefit from enhanced competition as shown by the end of 2012 when a new gas provider entered the market.

The transport infrastructure requires special attention, as the country's CO<sub>2</sub> intensity is higher than the EU average.<sup>9</sup> The high emissions intensity stems from the significant transit traffic and the unfavourable modal split. The high volume of freight transport, the downward trend in the use of public passenger transport and the above-average

<sup>5</sup> Source: 2013 Innovation Union scoreboard.

<sup>6</sup> Assessment of the 2013 national reform programme and stability programme for Slovenia; SWD(2013) 374.

<sup>7</sup> Source: Eurostat.

<sup>8</sup> Assessment of the 2013 national reform programme and stability programme for Slovenia; SWD(2013) 374.

<sup>9</sup> Source: Eurostat.

share of transport in total energy consumption contribute to the country's high energy intensity.

Greenhouse gas emission targets<sup>10</sup> in the forthcoming national energy programme (20% improvement in energy efficiency by 2020 and 27% by 2030, compared to 2008 levels) will be very difficult to attain, in particular because of the high contribution of the transport sector (27% of total emissions in 2010, the third highest share in the EU). Transport also accounts for 38% of total final energy consumption, which is well above the EU average (31.7%). Continuing investment in large-scale non-renewable energy projects, such as recent plans for a new coal-fired power plant, may crowd out investment in renewable energy sources.

The measures taken to improve energy efficiency include the introduction of feed-in tariffs for electricity from combined heat and power; energy efficiency obligations for utilities; refurbishment of public buildings; and various efficiency measures financed through a levy on energy.

Slovenian authorities adopted in June 2012 an action plan 'Wood is beautiful', which identifies timber as a strategic raw material and the wood processing industry as a sector with much untapped potential. The aim is to improve the competitiveness of the forest-wood value chain in Slovenia by 2020. The document includes a concrete set of objectives and implementing measures but it is linked with other strategic documents, such as the industrial policy, remains to be seen. Slovenia is lacking behind schedule in transposing relevant EU energy laws regarding energy efficiency, such as the Directives on energy efficiency and on the energy performance of buildings. Despite the problems it is facing, in the 2011 eco-innovation scoreboard Slovenia moved up from 10th to 7th place and is the best performing country among the EU-10 Member States.

#### 4.24.3 Export performance

Exports increased by 0.3% in 2012 compared to 2011,<sup>11</sup> which in combination with the sharp fall in imports led to a positive net balance (+3.3%). However, the export market share is declining, as the cumulative three-year loss is 6.4%.<sup>12</sup> This is mainly due to the strong focus on the EU, which has been in recession. The loss in market share reflects lower cost and non-cost competitiveness.

Competitiveness is harmed by challenges in the business environment, a rigid labour market, and high labour costs. On the non-cost competitiveness side, the industrial structure is dominated by low-to-medium technology and labour-intensive firms, although the importance of service exports is growing.

Internationalisation is supported through information and educational campaigns, the organisation of inward and outward business delegations and conferences, co-financing of trade fairs, business clubs abroad, the development of market analysis, and a training programme for export planning. Most of the measures are financed by the Ministry of Economic Development and Technology and are carried out by a specialised agency.<sup>13</sup>

Diversification of export markets and products would provide increased stability to exports. In addition, export policy is fragmented as many government and non-government bodies are involved, while monitoring results and links with other policies, such as industrial policy, are not clear enough. While the new industrial policy identifies priority technology fields and key industrial sectors in which to invest, the necessary action plans and concrete monitoring schemes are lacking in order to move to a more knowledge-based economy, thus providing a stronger base for good export performance.

#### 4.24.4 Business environment & public administration

##### *Business environment*

Measures such as electronic filing, payment of social security contributions and reduction of the corporate income tax rate have helped the country to improve its ranking in the World Bank's Doing Business report from 37th to 35th place. Although the costs and time it takes to start a business are low (the cost is close to zero, and the number of procedures is only two), other factors such as administrative procedures and the time and cost involved in dealing with construction permits lower the overall rank in the index. It takes considerable time and is costly to obtain a construction permit. Complex and time-consuming licensing procedures make the country unattractive for foreign investment.

Changes to insolvency legislation adopted in June 2013 will improve the insolvency framework, but

<sup>10</sup> Refers to sectors not covered by the Emissions Trading System.

<sup>11</sup> Source: EC Spring Forecast.

<sup>12</sup> Source: IDR 2013.

<sup>13</sup> The Public Agency for Entrepreneurship, Innovation, Development, Investment and Tourism (SPIRIT).

further measures may be needed to bring about sufficient improvement in this area as a suitable system of incentives for owners, creditors and managers is still lacking.

Professional services, which account for about 10% of value added,<sup>14</sup> remain heavily regulated, which limits their growth potential. In 2012, the authorities launched a reform to review numerous regulated professions. An inter-ministerial group was set up and the first professions and activities to be deregulated include the craft, tourism and construction sectors. A small business act has been adopted focusing on crafts, and a similar process is being planned for other sectors and professions in 2013 and 2014.

Slovenia has also developed its Point of Single Contact (PSC), which is based on the e-government e-VEM ("Vse na Enem Mestu" – One Stop Shop) portal for the online registration of businesses and its aim is to provide transparent online publication of information on conditions and procedures for performing activities and professions. Despite some progress in 2012, the information currently provided through the PSC is focused on a limited number of regulated activities (e.g. crafts, construction) while online completion of procedures is not yet possible for foreign operators. An SME test has already been designed and tried out on legislation. The action plan for implementing the small business act has been adopted by the government. The Ministry of Justice and Public Administration introduced a revised action plan for the removal of administrative burdens by 25 %.

Based on legislative changes made at the end of 2011, the Competition Protection Agency was established in January 2013, replacing the previous Competition Protection Office. While additional staff was transferred to the agency, it suffers from limited financial resources which are compounded by the budget cuts of 2013. Further amendments to the legislation to establish a separate budget line would help to ensure its independence and sufficient financing.

#### *Public administration*

The government effectiveness indicator is slightly below the EU average (1.03 as against 1.18). Slovenia scores higher in the public procurement indicator as the administrative regulations are more business-friendly than the EU average. The time and cost to take part in procurement are low and the average payment period is 15 days (28.3 days is the EU mean). However, Slovenia has not yet adopted

a plan for the transition to e-procurement and is one of the Member States with the least developed infrastructure. Although a new electronic portal was introduced recently, electronic tenders cannot be submitted. Currently the benefits of e-procurement, such as greater transparency, more competition and faster procedures, cannot be fully exploited.

The justice system still suffers from inefficiencies. Despite recent improvements, first-instance judicial proceedings in litigious civil and commercial cases remain long (disposition time was 431 days in 2010).<sup>15</sup> The rate of resolving litigious civil and commercial cases is low (in 2010, the clearance rate was 98 %),<sup>16</sup> while the number of pending non-criminal cases per inhabitant is the highest among the Member States,<sup>17</sup> although there has been some improvement in the clearance rate recently. However, in 2010 the clearance rate for administrative cases was the highest in Europe (rate of over 120 %).<sup>18</sup> Finally, Slovenia scores high in the corruption perception gap index (bribery and corrupt practices in business).<sup>19</sup>

#### 4.24.5 Finance and investment

The recession and the associated credit crunch have created a very difficult situation for most SMEs. The collapse of major construction companies and corporate arrears more generally have had a negative effect on balance sheets of banks, which have become very reluctant to lend, particularly avoiding the remaining, mostly smaller, construction companies. Many businesses are over-indebted and asset quality is deteriorating. The volume of loans to the domestic non-banking sector declined considerably in 2012. The situation in the domestic banking system continued to deteriorate in the early months of 2013, as the year-on-year contraction in the first five months of 2013 was 8.3 %.<sup>20</sup>

Financial instruments of the Slovenian Enterprise Fund include equity and debt financing (guarantee fund for bank loans with subsidised interest rates, microloans, counter-guarantees). These have helped in providing public guarantees and venture capital to innovative firms. Financial instruments (credits, guarantees) were used also by SID Bank. The Slovenian Enterprise Fund has emphasised the importance of start-ups by supporting them with

<sup>14</sup> Source: IDR 2013.

<sup>15</sup> Source: EU justice scoreboard.

<sup>16</sup> If the clearance rate is below 100 %, courts are resolving fewer cases than the number of incoming cases and as a result at the end of the year the number of pending cases builds up. Source: EU justice scoreboard.

<sup>17</sup> Source: The EU Justice Scoreboard, p. 10.

<sup>18</sup> Source: EU justice scoreboard.

<sup>19</sup> Fraud Survey 2013.

<sup>20</sup> Bank of Slovenia monthly bulletin, May 2013.



grants in the first three years of their life. A recent external evaluation indicated that the results of these instruments have been positive.<sup>21</sup>

While the instruments have supported many SMEs, a sharp fall in economic activity nonetheless has also reduced investment opportunities, including for innovative firms. Repairing bank balance sheets and recapitalising viable banks are two of the most important conditions for stabilising the economy and, in particular, for a resumption of bank lending.<sup>22</sup> Although relevant legislation is in place, just cleaning up the state-owned banks' balance sheets may not be sufficient, and further measures might be needed for lending to SMEs to resume.

In a weak macroeconomic context, facilitating investment through improving the business environment is crucial. The economy has a low stock of foreign direct investment (31 % of GDP in 2012,<sup>23</sup> one of the lowest among the new Member States).

#### 4.24.6 Conclusions

Slovenia's economy needs structural measures promoting growth and competitiveness and improving productivity. An improved business environment could help in attracting foreign investment and boosting exports. Currently there are bottlenecks that hinder investment, such as long procedures, regulated professions, lengthy judicial proceedings and inefficiencies in insolvency procedures.

To monitor improvements in the business environment, evaluation of policies and monitoring of a coherent set of indicators — at the moment missing — are needed for coherent policy-making. These indicators could cover policy areas such as the labour market and education system, regulated professions, the judicial system, business licensing procedures, the tax environment, environmental, energy and land use policy, and in particular access to finance.

The banking system remains fragile and lending constrained. Publicly supported financial engineering products of the Slovenian Enterprise Fund and SID Bank have worked well and helped in providing guarantees and venture capital to

innovative firms. It is important to build on such policy successes.

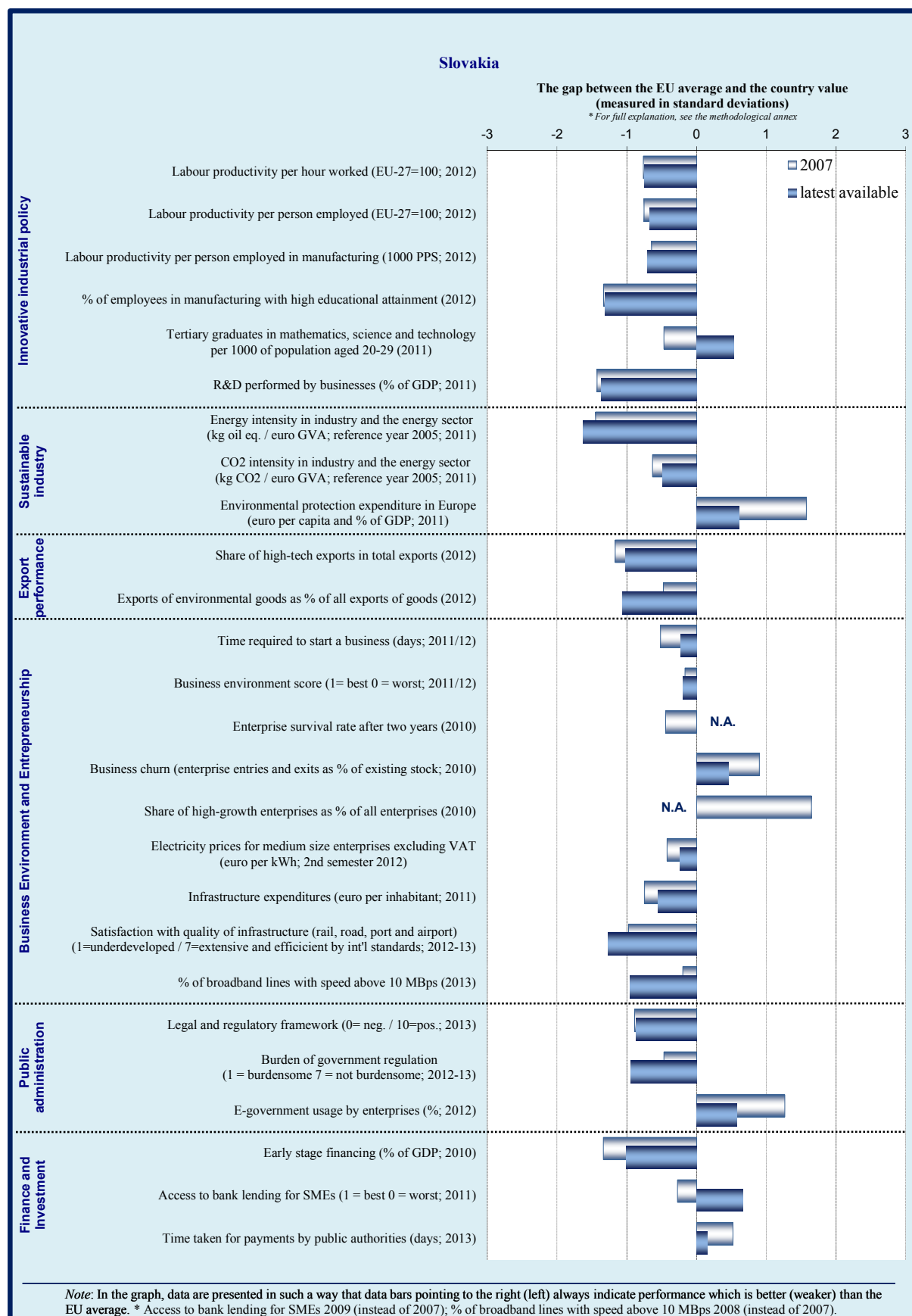
Measures to promote research and innovation continue to be essential, as in the long run these are the road to a more knowledge-intensive economy. While the new industrial policy identifies priority technology fields and key industrial sectors to invest in, the necessary action plans, concrete monitoring schemes and coordination between key strategic policies are critical for the economy to take off again.

<sup>21</sup> Expert evaluation network delivering policy analysis on the performance of cohesion policy 2007-13.

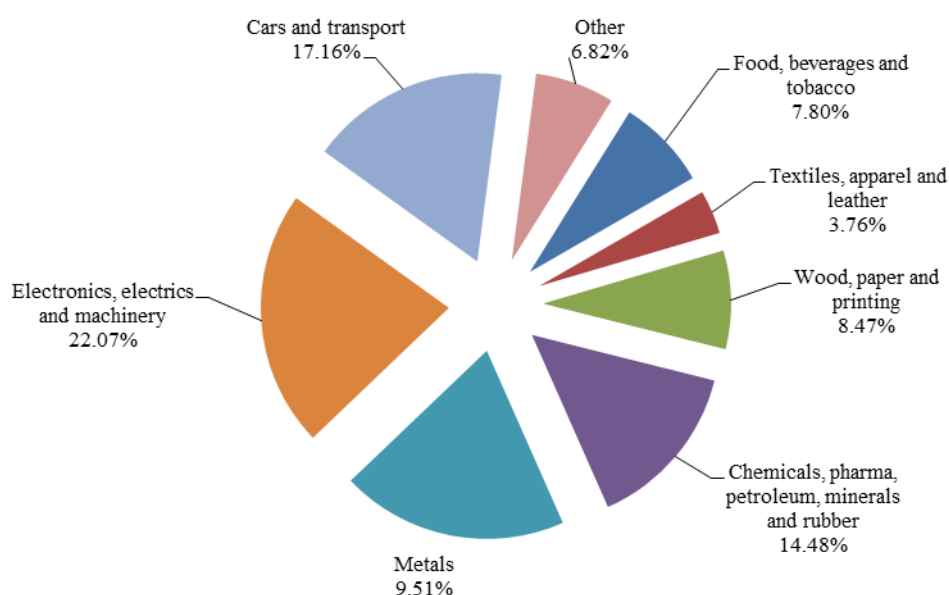
<sup>22</sup> [OECD Economic Surveys, Slovenia, April 2013](#).

<sup>23</sup> Source: Commission SWD: Assessment of the 2013 national reform programme and stability programme for Slovenia.

## 4.25. Slovakia





**Figure 5.2: Sectoral specialisation of manufacturing – Slovakia (2010)**

*Note:* No data available for sectors C12 (tobacco products) and C19 (coke and refined petroleum products)

*Source:* Eurostat

#### 4.25.1 Introduction

Slovakia's economy grew by 2% in 2012, one of the highest growth rates in the EU. The production of some export-driven manufacturing sectors reached record levels, with car plants operating at close to full capacity. However, construction contracted by 12.5% due to the weakness of domestic demand. Good external competitiveness and lower imports brought the current account into balance in 2012. The recovery slowed down in the first half of 2013, but is expected to rebound due to stronger private investment and external demand.

Manufacturing continues to play a prominent role in the economy. The capital-intensive and technology-driven industrial sectors such as automotive, electronics and metals in which Slovakia specialises increased their share in total EU manufacturing from 0.63 % in 2007 to 0.82 % in 2012. Based on unit labour costs, Slovak industry is among the most competitive in the 'catching-up' Member States. It has benefited from transfers of advanced technology based on foreign direct investment and manufacturing has become more productive in the past decade. However, the short-term potential for further leaps seems limited. Services constitute a relatively small part of the economy and have not been able to match the productivity improvements in manufacturing.

#### 4.25.2 Innovation, skills and sustainability

##### *Innovation*

The innovation capacity of the economy has improved somewhat in recent years, moving gradually towards higher knowledge-intensity. Overall, the performance of the R&D system remains below the EU average. Technology spillovers from the foreign direct investment of the last decade have been a major driver of innovation in production. The lack of domestic R&D capacity has given rise to a split between highly productive export-oriented multinationals and a domestic sector consisting largely of SMEs and a few large companies with low productivity and innovation capacity.

The lack of excellence in research and the quality of tertiary education remain major challenges, as can be seen from the low number of internationally cited scientific publications. The generation of intellectual assets and patent revenues has been low by international comparison. Limited cooperation between businesses and research institutions further contributes to the low presence of innovative enterprises. However, the number of new doctoral graduates and young people with upper secondary level education are relative strengths of the system.

After two decades of gradual decline, total R&D expenditure recovered to 0.68% of GDP in 2011 – still one of the lowest in the EU.<sup>24</sup> The limited cooperation between science and business is also a reflection of low private research investment. Public R&D spending has increasingly relied on EU structural funds.<sup>25</sup> To achieve its national R&D intensity target of 1.2% by 2020, Slovakia would need to increase its public and private investment by about 5% a year.

Slovakia's innovation policy is based to a large extent on grants. Tax breaks for applied research have been used since 2009, but represent only a very small part of total R&D support.<sup>26</sup> The innovation strategy for 2007-13 sets a general framework and the 2011-13 innovation policy has specified actions in three priority areas: infrastructure, quality of human resources, and support for innovation in industry. Most money is spent on the latter.

In 2012, the government launched new calls to support (i) applied research and development in industry (EUR 34 million) and (ii) technology transfer (EUR 150 million). Innovation vouchers have also been launched which give SMEs access to the services of public research facilities. A new scheme comprising financial and non-financial support has been designed for innovative clusters. The government has also started preparing the 2014-20 innovation strategy, under which it plans to further develop business incubators that will be attached to university science parks and selected research facilities. A new scheme similar to the existing small business innovation research programme is in preparation.

### *Skills*

The number of tertiary graduates studying science and technology has risen above the EU average in recent years, but there is still a shortage in technical studies. In addition, there are not enough job-oriented bachelor degrees compared to competitors.

The low proportion<sup>27</sup> of people with high qualifications (in particular with labour market relevance) employed in manufacturing suggests that shortcomings in the education system have created skills shortages and structural mismatches in the labour market. Although the vocational training system was revised to improve the match with labour demand, the provision of work-based learning in companies for students in vocational education and training is low. Tertiary level education was also reformed, strengthening internal quality assurance systems and encouraging internationalisation. In the longer run, there are concerns about the level of public spending on education, which is one of the lowest in the EU as a share of GDP.

### *Sustainability*

High energy prices and structural and technological changes have been the main drivers of a reduction in energy intensity. In spite of continued progress, Slovak industry<sup>28</sup> was the fourth<sup>29</sup> most energy-intensive in the EU in 2011. The greening of the economy is a policy challenge, in particular due to the relatively high of energy-intensive industries (e.g. aluminium and steel production). Although the CO<sub>2</sub> intensity of industry has continued to decline, no improvement has been observed since 2009 for the economy as a whole.<sup>30</sup>

The volume of waste generated by industry has been declining since 2006, suggesting a decoupling from growth. In 2011, Slovakia used landfills for 75% of its municipal waste (80% in 2010) and material recycling has remained at 4%, which is one of the worst rates in the EU. Apart from a recycling fund, there were no specific policies in 2012 on the industrial re-use of waste or spreading green business models. On the basis of a new law, preparations are being made for a transition from landfills to waste recycling and recovering energy and material. A new waste management strategy will also be prepared by 2016.

Policy on energy efficiency is predominantly driven by the implementation of EU structural fund programmes. The national energy efficiency action

<sup>24</sup> 3.88% in 1989, 0.66% in 1999, 0.48% in 2009, 0.63% in 2010.

<sup>25</sup> In 2012, 81% of R&D funds came from the R&D Operational Programme (OP), whereas innovation policy measures were almost completely funded by the Competitiveness and Growth OP.

<sup>26</sup> 2.1% in 2011.

<sup>27</sup> 9.7% as compared with the EU average of 19.2% in 2011.

<sup>28</sup> Including the energy sector.

<sup>29</sup> Fifth in 2010.

<sup>30</sup> 0.47 CO<sub>2</sub>e/GDP in 2009 and 2010.

plan for 2011-13 is expected to achieve a 2.7% reduction in final energy consumption as compared with the 2001-05 average. Most savings are to be achieved by industry (30%), the public sector (27%) and buildings (21%). The national energy efficiency monitoring system is now in operation. Together with the European Bank for Reconstruction and Development, the Slovak Innovation and Energy Agency has implemented a pilot programme on energy efficiency in public buildings. In 2013, the government started preparing the national energy efficiency action plan for 2014-16.

### 4.25.3 Export performance

Exports have been a major source of recent economic growth. Foreign direct investment has primarily gone to export-oriented manufacturing and has significantly contributed to the restructuring of the economy, which is open and well integrated in the global economy, in particular the single market, as a result. The trade surplus was over 3% of GDP in 2012, bringing the current account into balance. The share in EU exports of goods and services went up from 0.98 in 2007 to 1.18% in 2012. The export market share<sup>31</sup> grew annually by more than 50% between 2004 and 2008, but growth has since slowed (to 4.8% in 2012), partly due to lower inflows of foreign investment.

The main exports include cars and car components, consumer electronics, machinery and metal products; services play a much smaller role. The proportion of total exports accounted for by high-tech goods increased slightly to 6.6% in 2011, whereas that accounted for by non-financial knowledge-intensive services is one of the lowest in the EU. In comparison to similar-sized economies in the EU, the domestic value-added content of exports was relatively low,<sup>32</sup> as imports were essential for the export capacity of a small economy.

To facilitate exports by domestic enterprises, the government has decided to increase the capital of the state-owned Slovak Export-Import Bank. The capital hike will boost the bank's guarantee and

risk-coverage capacity by EUR 463 million and enable it to focus more on fast-growing higher-risk markets such as Russia, Vietnam and Indonesia.

### 4.25.4 Business environment and public administration

#### *Business environment*

As in the previous year, Slovakia was 46th in the World Bank ranking on the ease of doing business. The legislative and regulatory framework for businesses remains complex and is subject to frequent change. A comprehensive strategy to improve the business environment was adopted in 2011 and updated with new measures in 2013. While over 50 measures have been implemented since 2011, it appears that the goal of reducing the administrative burden on business by 2012 has not been fully achieved.<sup>33</sup> The government will assess the costs of the administrative burden again in 2014.

The 2013 national reform programme contained an explicit target of reaching 15th position in the World Bank ranking by 2020 and lowering the OECD product market regulatory index to 1.2 (1.54 in 2008). To achieve this, the plan is to remove regulations that may distort competition in professional services, including possibly restricting mandatory membership in professional chambers.

Competition in the energy sector has improved in recent years, but the fact that few consumers are switching their provider (1.6% of industrial users and 0.8% of households) does not make for a dynamic market. Electricity prices for medium-sized industrial consumers are among the highest in the EU. This appears to be due less to taxes or generation prices than to high network tariffs. The network tariffs cover not only costs and the profit margin of distribution companies and the state-owned grid operator, but also the support for renewable energy sources, domestic coal production and co-generation.

Feed-in tariffs for renewable energy sources have been lowered because the costs of renewable energy, particularly photovoltaic, have declined

<sup>31</sup> Shares in world exports of goods and services.

<sup>32</sup> OECD-WTO Trade in value added indicators.

<sup>33</sup> The 2013 National Reform Programme indicates that it has been achieved by about 60%.

significantly. To achieve the emission reduction target in the energy sector, there are plans to review the support given to domestic coal production, which has been cross-subsidised from higher network tariffs.

The time needed to start a business was reduced to three days for those needing a trade licence and to two days for registering a company in court. Many other entrepreneurship indicators are below EU average, partly because attitudes towards entrepreneurship are not positive enough and it is not encouraged by schools.

The government intends to launch an e-building code covering zoning procedures and regional development, which would enable citizens and entrepreneurs to handle the entire construction permit procedure by electronic means. To avoid frequent changes in legislation with significant impact on businesses, the government's legislative rules contain a new *vacatio legis* obligation whereby new legislation on taxation and social security can enter into force only on 1 January of a given year.

Slovakia's location between eastern and western European markets makes great demands on its transport infrastructure. Although satisfaction with the quality of infrastructure increased between 2008 and 2012, in eastern regions poor infrastructure is a brake on productivity. The government plans to start the construction of around 120 km of new motorways by 2014, despite delays caused by procurement difficulties.

#### *Public administration*

The public administration suffers from weaknesses that reduce its effectiveness and undermine its independence. The 2011 Worldwide Government Effectiveness indicator ranked Slovakia 19th in the EU. Modern human resources management methods are not used enough. A high turnover of staff and a lack of transparency in recruitment practices increase the scope for political meddling, which is not conducive to an independent civil service. Weak analytical capacity hampers the design and implementation of policies and the ability to assess regulatory impact. There is no ex-ante SME test and impact assessments are often formalistic, with a tendency to focus only on fiscal impact. There is no independent body to evaluate

the quality of impact assessments. To improve the situation, the government has created analytical units in key ministries.

In 2012, the government launched a major reform of the public administration. Initially, the main objective is to streamline the organisational structure of local and district-level state administrations and integrate their customer service functions into single contact points. As part of the reform, all ministries and central government bodies will be subject to functional audits that will identify duplication and the potential for process improvements, and rationalise the management of state assets (such as buildings). At a later stage, the reform should be extended to human resources management.

Judicial proceedings for civil and commercial cases remain lengthy, in particular as regards insolvencies.<sup>34</sup> To address this, the government has started to prepare a completely new code of civil procedures that should come into force in 2015. It is also improving courts' IT systems so that case-file life-cycles will be fully electronic by 2014.

Perceptions of corruption<sup>35</sup> continue to be high. Individual experiences of corruption and irregular payments by firms are not uncommon. There are serious concerns as to the capacity of law enforcement and judicial authorities to investigate and prosecute corruption offences.<sup>36</sup>

Despite improved transparency, irregularities in public procurement have persisted and the average number of bids was among the lowest in the EU in 2011, indicating a very low level of competition. To address this, the Public Procurement Act has been amended to create a central electronic market that is obligatory for small tenders. A new appeals body<sup>37</sup> consisting of a majority of external members has been created to scrutinise decisions by the public procurement office. Also, the office's resources and staffing have been strengthened significantly.

While the use and availability of e-government services for businesses are above and close to the

<sup>34</sup> EU Justice Scoreboard 2013.

<sup>35</sup> Transparency International ranked Slovakia 62nd in its global corruption perception index.

<sup>36</sup> OECD Report on implementing the OECD Anti-Bribery Convention in the Slovak Republic, June 2012.

<sup>37</sup> Board of the Public Procurement Office.

EU average, respectively, a lot remains to be done to improve such services for citizens.<sup>38</sup> Other areas for improvement are internal government transactions and the interoperability of databases across public institutions. To this end, a central public administration portal is being implemented, as is an act on electronic operations by public authorities.

#### 4.25.5 Finance and investment

The financing conditions and standards for SMEs have been tightened since 2009. The share of loan applications rejected went up from 19% in 2010 to 25% in 2011, as compared with an EU average of 15%. Although the volume of loans to non-financial firms<sup>39</sup> continued to grow moderately for a while, it started to decline in 2012 (- 3.6%) as the economy slowed.

Little progress has been achieved in developing stock exchanges and the venture capital market. The lack of equity finance means that bank loans are crucial for SMEs and start-ups. As a part of the Jeremie scheme for structural funds, the Slovak Guarantee and Development Fund has introduced (i) a first loss guarantee and (ii) a risk capital instrument. The first guarantee agreements were signed in April 2013, allowing participating banks to provide up to EUR 170 million of new loans to SMEs. The risk capital instrument should be launched later in 2013.

In spite of shortcomings in the business environment, Slovakia is a favourable investment location due to its geographical position, cost competitiveness and stable macroeconomic environment. Investment in equipment remained very strong in 2010-12, accounting for more than 10% of GDP — one of the highest rates in the EU.

The Slovak Investment Promotion and Trade Development Agency attracts more and more new investment in sectors with high added value. The regional focus has shifted more towards fast-growing markets, including Russia, China, South Korea and the rest of South-East Asia. In line with

the cohesion policy objective, investment support programmes and state aid rules favour Slovakia's less developed eastern regions.

#### 4.25.6 Conclusions

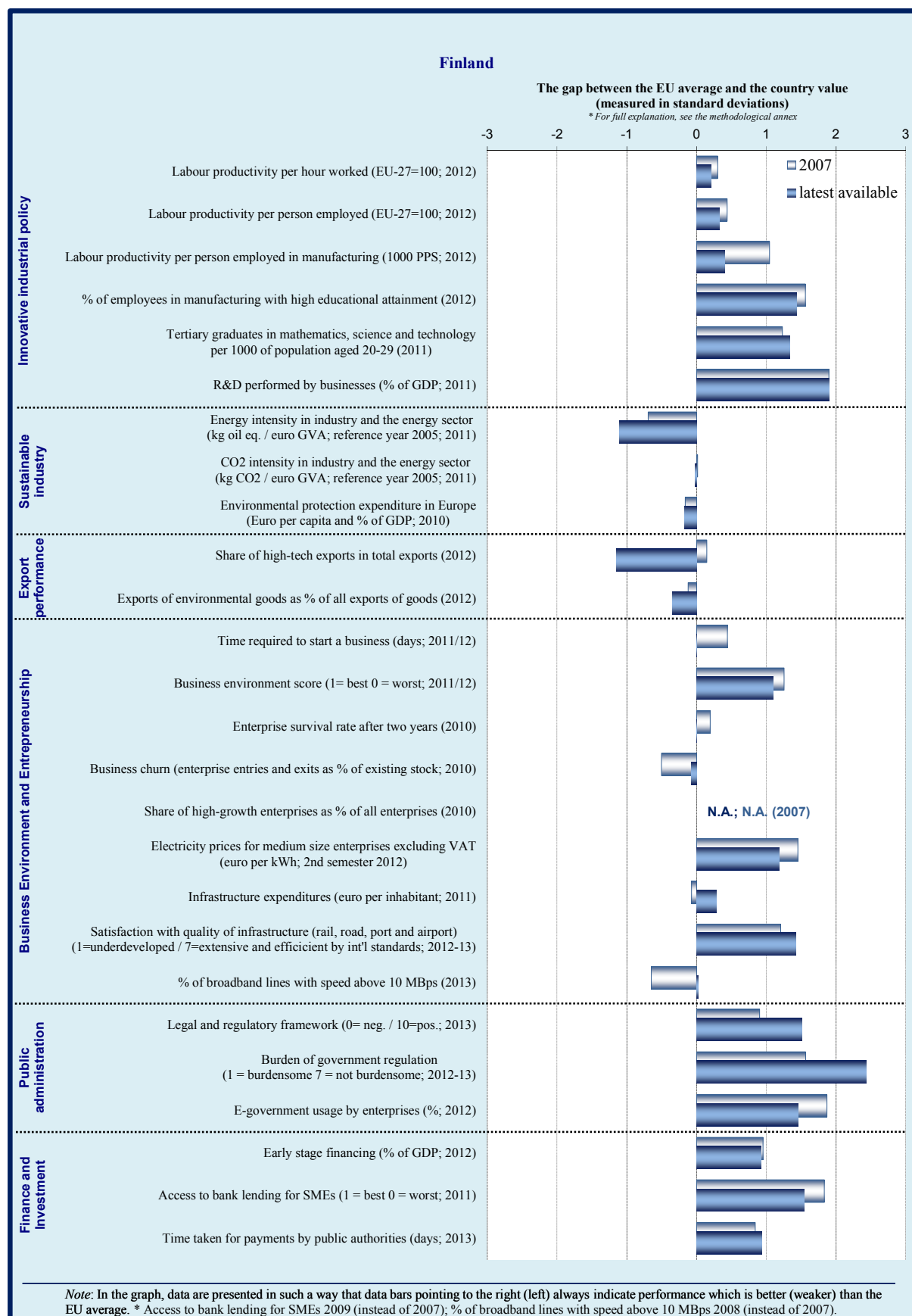
Improving productivity and competitiveness have made the Slovak economy more attractive. The challenges in education and the R&D system limit the longer-term potential, as innovation capacity can be built up and the move towards a more knowledge-based economy can take place only relatively slowly.

The multinationals are highly productive, but the main policy challenge is to boost innovation and knowledge intensity in domestic firms, in particular SMEs, and to invest more in education. Improvements in public administration and the judiciary would help businesses and the investment climate. Further challenges are posed by the high energy intensity and rather high energy prices, in particular for some business segments.

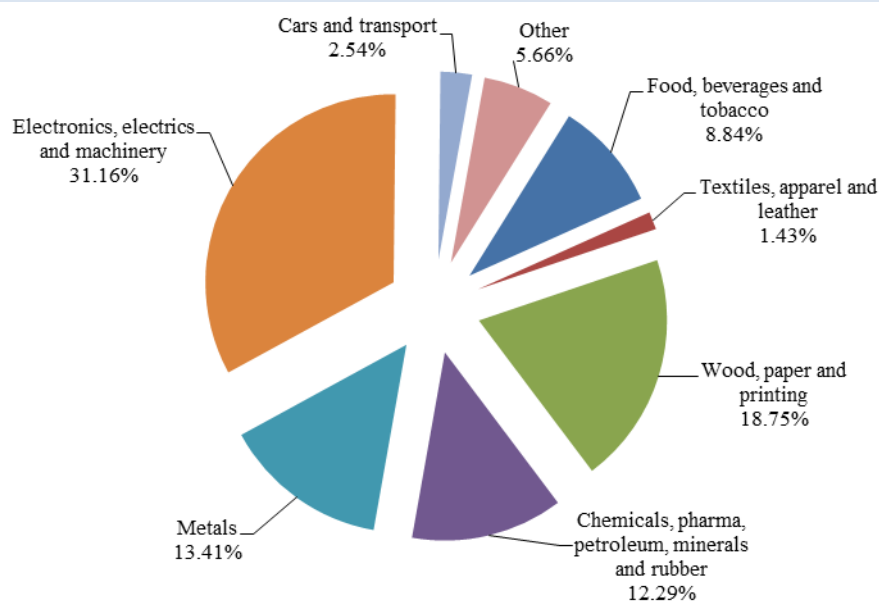
<sup>38</sup> Digital Agenda for Europa; Global e-government development index (UN) in 2012.

<sup>39</sup> National Bank of Slovakia — statistics on loans granted between January and December 2012.

## 4.26. Finland





**Figure 5.3: Manufacturing sectors – Finland (2010)**

*Note:* No data available for sectors C12 (tobacco products), C19 (coke and refined petroleum products) and C23 (manufacture of other non-metallic mineral products)

*Source:* Eurostat

#### 4.26.1 Introduction

Finland specialises in knowledge-intensive sectors and the share of manufacturing in total value added is 16.9%, which is higher than the EU average of 15.3%. Technology industries that include electronics, machinery and metals are the largest employers, with 250 000 directly employed.

In terms of average unit labour costs, Finland's competitiveness has been gradually eroded over the past ten years, in particular in 2008-09, but has reclaimed some ground recently. However, looking beyond the average figures, the traditional export industries have performed quite well, whereas labour productivity in services is improving only slowly. Finland's own experience from the 1990s shows that the entry and exit of new firms and the reallocation of resources can radically improve productivity.<sup>40</sup>

#### 4.26.2 Innovation, skills and sustainability

##### *Innovation*

Finland is among the consistent performers in terms of the variables of the Industrial Performance Scoreboard. In particular, it ranks among the top performers in innovation, business environment, public administration and access to finance.

Finland invests a total of 3.78% of its GDP in research and development,<sup>41</sup> which, although slightly lower than in 2010, keeps the country close to its 4% national target for 2020. Businesses invest two-thirds (EUR 5 billion) of the total and this investment has held up well even in the recession. Public research and innovation investment dropped to about EUR 2 billion in 2011. To promote further private investment, the government has introduced a tax credit for research investment by businesses for 2013 and 2014.

The 2013 Innovation Union Scoreboard<sup>42</sup> has Finland in fourth place overall, but highlights some

<sup>40</sup> See M. Maliranta, P. Rouvinen, P. Ylä-Anttila *Finland's Path to the Global Frontier through Creative Destruction*, International Productivity Monitor 20, 2010.

<sup>41</sup> Eurostat 2011.

<sup>42</sup> [http://ec.europa.eu/enterprise/policies/innovation/files/ius-2013\\_en.pdf](http://ec.europa.eu/enterprise/policies/innovation/files/ius-2013_en.pdf).

of the problems affecting the Finnish research and innovation system. It is widely recognised, including by the government, that the innovation system lacks sufficient international exposure and that attracting international knowledge workers to Finland is difficult.

Although Finnish growth companies are growing faster and become bigger than their rivals in other Nordic countries, they are too few in number to contribute decisively to structural change in the economy. In particular, there are not enough new innovation-based and growth-oriented enterprises. One reason is that entrepreneurship and management skills remain weak, although the entrepreneurial culture has improved significantly over the past few years.<sup>43</sup>

Currently, most new innovative activity in Finland is focused on ICT, software and games.<sup>44</sup> To provide a broader base for innovation, the Smart Cities programme<sup>45</sup> has created platforms for innovative solutions in urban environments by bringing together the main players in the innovation cycle. The government is also implementing the recommendations of a high-level group report on ICT competitiveness (*Frictionless Finland*), including a new national service infrastructure and increased seed and growth funding for start-ups.

To foster research cooperation aimed at breakthrough innovations, there are six Strategic Centres for Science, Technology and Innovation (SHOKs), public-private partnerships focusing, for example, on bio-economy, forestry and health. A 2013 evaluation of the Centres concluded that they had not fully lived up to their promise and progress could have been faster.<sup>46</sup> On the basis of the evaluation, the managers of the Centres (which are private firms) have decided to take steps to sharpen focus, enhance networking, increase competition for funding, and improve management.

A sharper focus on knowledge transfer and on a more active role for the universities could help to bridge the gap between research and businesses. To

this end, the government is developing better indicators on knowledge transfer to compare university performance. To achieve sufficient critical mass in their commercial efforts, there is plenty of scope for the universities to cooperate more and become more specialised. They could also strengthen the link between basic and applied research. The government is looking at Tekes<sup>47</sup> programmes to promote growth entrepreneurship by combining technical research and commercialisation.

### *Skills*

The overall well-performing education system and highly skilled workforce will help in reallocating resources. Finland has a high share of science, technology, engineering and mathematics (STEM) graduates<sup>48</sup> and has already reached its national tertiary attainment target for 2020. However, there is further potential to reform the sector, in particular to achieve efficiency gains in higher education, and shorten the time to graduate, which is now one of the longest in the OECD.

Further targeted support for improving the skills of particular groups such as older and low-skilled workers and unemployed young people could help overcoming emerging skills shortages. The new youth guarantee system is based on public-private partnership involving authorities, trade unions and young people. The government has also reformed and decentralised the guidance system for the transition to working life.

### *Sustainability*

On sustainable industrial policy, the government is analysing how best to increase energy and material efficiency, with material audits being gradually deployed as planned in the government's resource efficiency programme. It is expected that a new materials efficiency programme, currently in preparation, will be presented by autumn 2013. Meanwhile, waste streams to landfill sites have been considerably reduced, with a tax of EUR 50/tonne and increased energy recovery and recycling.

<sup>43</sup> [http://www.nordicinnovation.org/Global/Publications/Reports/2013/NGER\\_2012\\_FINAL\\_inclApps.pdf](http://www.nordicinnovation.org/Global/Publications/Reports/2013/NGER_2012_FINAL_inclApps.pdf).

<sup>44</sup> Based on Tekes' view of the funding proposals (see footnote 9).

<sup>45</sup> Run by Tekes: <http://www.tekes.fi/programmes/Kaupunki>.

<sup>46</sup> [http://www.tekes.fi/u/Licence\\_to\\_SHOK.pdf](http://www.tekes.fi/u/Licence_to_SHOK.pdf).

<sup>47</sup> Tekes is the Finnish Funding Agency for Technology and Innovation.

<sup>48</sup> Finland has 24.2 graduates per 1,000 young people age 20-29 in 2010, in comparison to 14.4 for the EU average in 2009.

According to preliminary data, total greenhouse gas emissions in 2012 amounted to 61.4 million tonnes of carbon dioxide equivalent, which is 8% lower than in 2011, and well below the commitment made in the Kyoto Protocol.<sup>49</sup> The share of renewable sources in gross final energy consumption in 2010 was over 32%, which is almost three times as high as the EU average of 12.5%.

Finnish industry continues to be considerably more energy-intensive than the EU average or its closest competitors. Although this reflects the dominance of process industries and the forestry industry, for example, produces itself most of the energy it uses, using less energy and raw materials for each euro of value added would be desirable.

Electricity users continue to benefit from the competitive Nordic electricity pool and electricity prices for medium-sized enterprises are among the lowest in the EU. A second electricity link to Estonia is being constructed and possible ways of exporting electricity to Russia are under consideration. By 2014, smart electricity meters will be installed for close to 100% of all customers.

The government is preparing three action plans on advanced manufacturing technologies: sustainable mining, bio-economy, and an update on the energy and climate strategy. The action plans are also designed to support the implementation of the government's raw materials strategy. Specific attention has been paid to bio-based products, where the challenge is access to the requisite raw materials. Currently, the focus is on expanding the sustainable use of forest-based biomass in products like bio-oil, nanocellulose or biodiesel.

The government is also trying to expand the markets for cleantech products, in particular through public procurement. The goal is to procure cleantech solutions for EUR 300 million annually. However, although there seems to be considerable interest in cleantech among entrepreneurs, in practice not many of them have been able to develop tangible business activities.

### 4.26.3 Export performance

Finland's current account balance has been on a downward trend for 10 years and is expected to stay negative (forecast -1.2% in 2015). Although there was a slight trade surplus in 2012,<sup>50</sup> this was due to imports shrinking more than exports. Export growth is expected to stay sluggish in 2013, but the prospects should improve in 2014-15 as world growth is likely to take off.

The difficulties in exports are caused by the structural change in the electronics industry (Nokia transferring production out of Finland) and the difficulties of the forestry industry. This has been echoed throughout the economy, as Finnish small and medium-sized enterprises (SMEs) mostly serve multinational companies instead of exporting themselves. The difficulties of the leading industries have made this strategy less viable and SMEs' growth prospects would benefit from identifying potential for export growth and expanding to international markets.

The gradual closing of Nokia production in Finland has created a need for structural adjustment and a transfer of resources to new growing enterprises. By late 2012, about 70% of ex-Nokia employees were in employment, in training or had started a business,<sup>51</sup> but the net effect of the closures will become evident only as the compensation packages come to an end towards late 2013.

The government adopted a strategy on the internationalisation of SMEs in 2011 and has sought to give it new impetus by combining it with the 'Team Finland' initiative, which has recently brought all actors working for export and foreign investment promotion under the same strategic umbrella under the Prime Minister. The initiative has a global network of 72 teams and a set of regional contact points in Finland.

As regards its position in global value chains through the domestic value-added content of exports, Finland is among the middling performers, with slightly less than 68% of the value added produced in the country. The government is reviewing policy options as to how to increase the

<sup>49</sup> Statistics Finland;  
[http://www.stat.fi/til/khki/index\\_en.html](http://www.stat.fi/til/khki/index_en.html).

<sup>50</sup> Bank of Finland statistics.  
<sup>51</sup> Government estimates.

proportion of value added that Finland could capture from global value chains.

#### 4.26.4 Business environment and public administration

##### *Business environment*

Finland scores highly on business environment, entrepreneurship and SME-related indicators. The effective and well-functioning public administration, the stable legal system and lack of corruption contribute to the high scores. In addition, Finland remains the EU leader in entrepreneurship, with the highest overall score of all EU countries. Entrepreneurs are valued highly and growth entrepreneurs are given a high profile in the media. In total, 45% of Finns think it would be feasible for them to start their own business (EU average 28%),<sup>52</sup> but Finnish entrepreneurs are often satisfied with moderate business growth and only about 8% are oriented towards rapid growth.

The modern and efficient environment is also reflected in the use and availability of e-government services, both of which are well above the EU average.<sup>53</sup> The use of e-commerce is also well above EU average, although the penetration of broadband lines is only just better.

The government has recently recognised many of the challenges posed by the few growth firms<sup>54</sup> and has outlined a general strategy to increase labour input and productivity in the economy. It seeks to build a stronger ecosystem for growth, in particular as regards management skills and smart money.

The administrative burden for businesses, though not high, had not been reduced noticeably by the first half of 2012,<sup>55</sup> despite government policy efforts. In particular, the burden relating to employing people and paying taxes has not changed and no substantial new reductions are in sight. The

adoption of reverse VAT<sup>56</sup> could bring down costs for firms in the long run.

Legislative impact assessments have been performed since 2007, but Finland does not currently have an impact assessment board to evaluate their quality. Efforts to improve the quality of assessments include providing support for ministries and reviewing assessments ex-post.

The positive environment for business start-ups is reflected in the services available. The Enterprise Finland website provides a one-stop shop for information on assistance available to companies and entrepreneurs, especially SMEs.<sup>57</sup> For the majority of firms, all paperwork can now be done through this web portal, which also provides access to the 'point of single contact' (PSC), with information for businesses at all stages of business life cycle.

The corporate tax rate was slightly above the EU average in 2012<sup>58</sup> but the government decided in 2013 to lower the nominal rate to 20% to promote growth and employment.

There is not enough competition in retail trade and some services, and this reduces incentives to improve productivity. The government has introduced measures to promote retail competition and a general initiative to promote sound and efficient competition that will first affect utilities and state-owned entities. A legislative initiative has been taken which is designed to allow the Consumer and Competition Authority to intervene in cases where competition neutrality between public and private operators is not respected. This will be presented to parliament in the first half of 2013. The government is also evaluating obstacles to competition in city planning and construction, the non-profit sector, waste disposal, pharmaceuticals and digital services.

<sup>52</sup> [http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/performance-review/files/countries-sheets/2012/finland\\_en.pdf](http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/performance-review/files/countries-sheets/2012/finland_en.pdf).

<sup>53</sup> <https://ec.europa.eu/digital-agenda/node/640>.

<sup>54</sup> See *Industrial Competitiveness Approach — Means to Guarantee Economic Growth in Finland in the 2010s*; Ministry of Employment and the Economy, 2013.

<sup>55</sup> [https://www.tem.fi/files/32917/TEMrap\\_15\\_2012.pdf](https://www.tem.fi/files/32917/TEMrap_15_2012.pdf).

<sup>56</sup> In reverse VAT, the buyer pays the tax due to the authorities, not the seller.

<sup>57</sup> <http://www.yrityssuomi.fi/web/enterprise-finland>.

<sup>58</sup> In 2012, the nominal rate was 24.5% (EU average 23.2%) and the mean effective rate 23.3% (EU average 21.1%). See "Final report 2012: Effective Tax Levels Using the Devereux/Griffith Methodology", ZEW Project for the European Commission TAXUD/2008/CC/099.

*Public administration*

Public administration in Finland is generally efficient and well-functioning. Currently, the country is seeking to reform its municipalities, aiming to establish larger, more efficient service providers in health and social services. Besides the scope for administrative efficiency, the reforms will have other effects. The impact on public procurement remains to be seen, but could include increased competition and more impartial decision-making. On the other hand, there is a danger that bigger municipalities could mean bigger lots, favouring bigger firms and discriminating against SMEs. At central government level, this is being addressed through specific procurement procedures for SMEs, and similar approaches might also be beneficial in larger municipalities.

response to close-to-zero net foreign direct investment in 2008-11.<sup>60</sup>

**4.26.5 Finance and investment**

Although SMEs' access to finance has not traditionally been a problem in Finland, recent anecdotal evidence suggests that the situation is deteriorating. Loan conditions seem to be tightening, although projects considered as 'good' by the banks can still secure financing. At the same time, alternatives to bank lending are gradually gaining a foothold, including venture capital and emerging small-scale platforms for peer-to-peer funding.

Productive investments are expected to continue to shrink in 2013 and new investment in machinery, in particular, is likely to be exceptionally low due to the uncertain demand.<sup>59</sup>

To facilitate innovation and growth, the government has committed itself to considerable increases in its investments in venture capital funds. It aims to attract private investors through an asymmetrical reward structure favouring private over public investors and make Tekes the key investor for high-tech and high-growth firms.

The Team Finland initiative also seeks to attract foreign direct investment to the country, a partial

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<sup>59</sup> Bank of Finland estimate.

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<sup>60</sup> Bank of Finland estimate.

#### 4.26.6 Conclusions

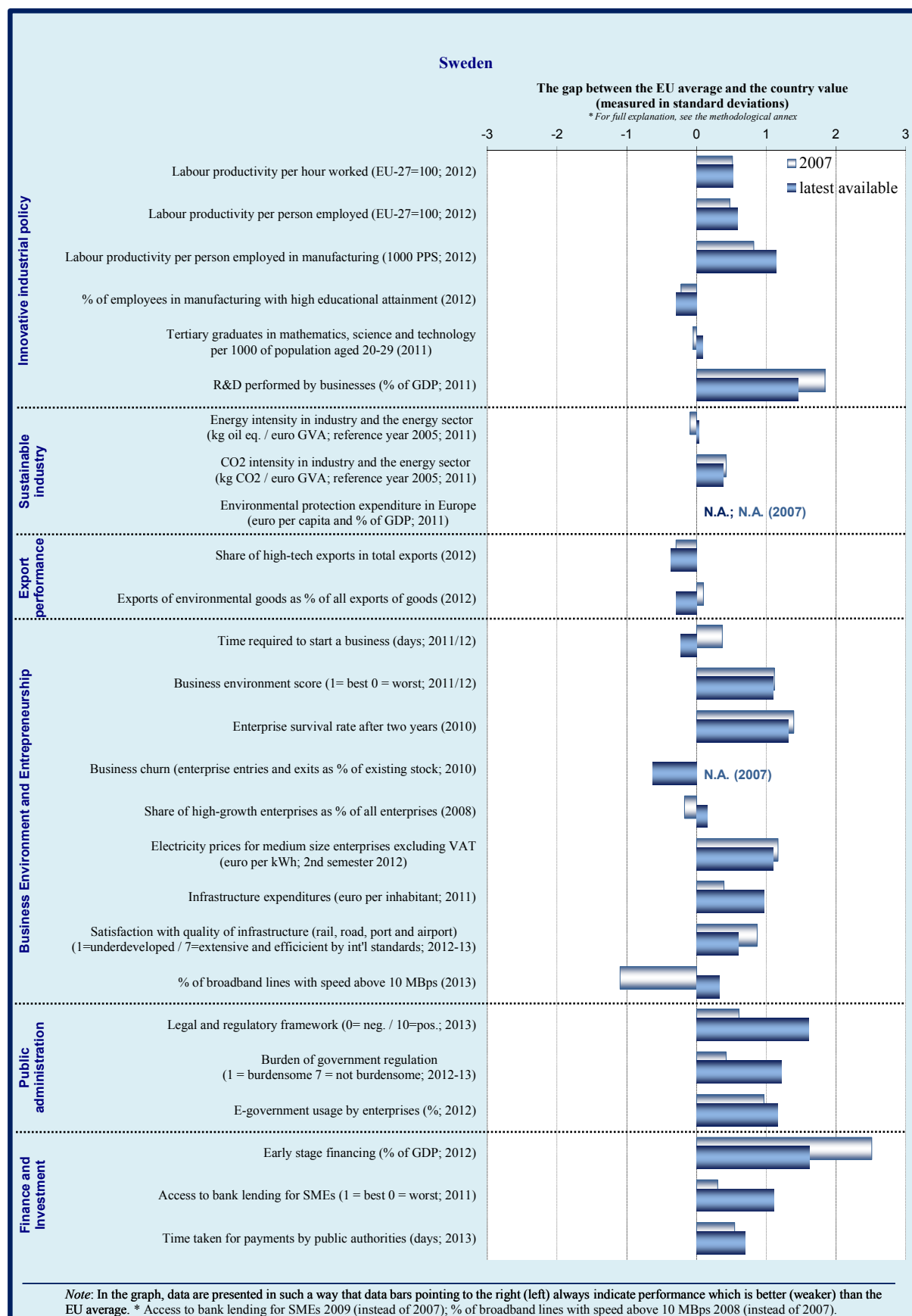
Finland ranks among the top performers on many competitiveness indicators, but has underlying problems that need to be addressed to preserve its good performance. In particular, the difficulties of the telecommunications and forestry industries mean that structural change is necessary. However, whether resources are being reallocated to new firms on a sufficient scale to have a visible effect on growth and exports remains to be seen.

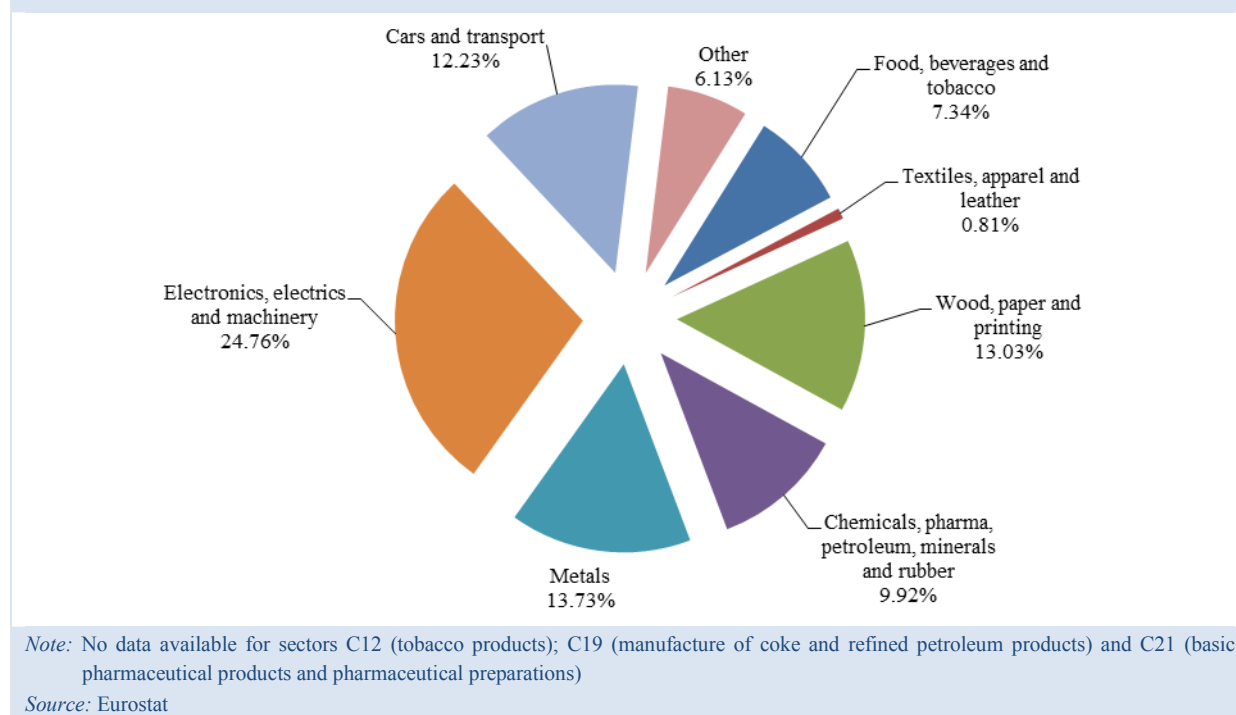
Some innovative enterprises are expanding rapidly and contributing to growth, but they are too few in number. Overall, the disappointing export performance reflects the limited internationalisation of SMEs, which need to become more international and access new markets. Finnish SMEs would benefit from a stronger ecosystem for firm growth, in particular expanding access to management skills and smart money. The government has initiated policies that seek to address these deficiencies, but the results will be evident only over time.

In a global environment where many countries are rapidly reducing the administrative burden on business, no country can afford to stand still. Finland has the potential to further reduce this burden, in particular as progress so far has been very limited. It could also improve productivity by increasing competition in retail trade and some services.



## 4.27. Sweden



**Figure 5.4: Manufacturing sectors – Sweden (2010)**

#### 4.27.1 Introduction

While manufacturing remains important as a generator of product innovation, export income and prosperity in Sweden, the economy continues to move towards services. Swedish manufacturing specialises in capital-intensive industries such as the processing of iron and steel, pulp and paper; in mainstream manufacturing such as insulated wire and cable, general and special-purpose machinery; in technology-driven industries such as TV/radio transmitters and receivers; and in chemicals, pharmaceuticals and cars and transport. The high relative export shares of computer and information services, research and development, and royalties and licence fees indicate that Sweden is also specialised in sectors requiring higher education.

According to EUROSTAT, in 2011 labour productivity per person employed was 15.8% higher in Sweden than the EU average. According to the *Global Competitiveness Index 2012-13* of the World Economic Forum, Sweden is one of the most productive and competitive economies in the world. Productivity growth was low or negative from 2007 to 2009 but rebounded strongly in 2010 and 2011.

With lower inflation, this resulted in unit labour costs falling for the period.<sup>61</sup>

#### 4.27.2 Innovation, skills and sustainability

##### *Innovation*

The pursuit of an active innovation policy and investments in R&D continue to be at the top of the agenda for the Swedish government. The OECD Review<sup>62</sup> on innovation policy demonstrates this, as Sweden's innovation performance is ranked as one of the best in the world. The 2013 Innovation Union Scoreboard<sup>63</sup> has Sweden as the EU innovation leader for the third time in a row. The relative strength of the Swedish innovation system is in human resources. However, a decline can be seen for sales of new-to-market and new-to-firm innovations.

<sup>61</sup> European Commission, *European economy, Macroeconomic imbalance, Sweden*, Occasional Paper, July 2012.

<sup>62</sup> OECD Reviews of innovation policy: Sweden 2012.

<sup>63</sup> [http://ec.europa.eu/enterprise/policies/innovation/files/ius-2013\\_en.pdf](http://ec.europa.eu/enterprise/policies/innovation/files/ius-2013_en.pdf).

Despite the high international ranking, there are challenges ahead. Sweden has always benefited from the presence of R&D-intensive industries but increasingly firms have chosen to invest mainly outside Sweden<sup>64</sup> and some have relocated abroad. As the importance of knowledge-intensive goods and services in exports is increasing<sup>65</sup>, there is growing concern that the high investment in R&D leads only to limited growth in the form of new innovative ideas that prove to be commercially viable.

Total R&D expenditure in 2011 amounted to 3.38% of GDP, one of the highest levels in Europe. Some studies have pointed out that the high R&D expenditures do not appear to be fully delivering economic growth and have called this the ‘Swedish paradox’. Looking further along the chain, according to another study, there is no clear correlation between R&D expenditure and GDP growth.<sup>66</sup>

However, despite these caveats, a Research and Innovation Bill was adopted in October 2012 setting out priorities for 2013-16, including a proposed SEK 4 billion (EUR 470 million) increase in funding for research and innovation. The overall aim of the bill is to increase the quality of research, and to invest in areas of particular interest to business and thereby strengthen the links between R&D investments and economic growth. One specific programme is aimed at strategic innovation areas to develop collaboration between companies and higher education institutions. The Research and Innovation Bill is one of the first items under the innovation strategy that focuses on how Sweden should work in the long term to promote innovation.

### Skills

According to the World Economic Forum’s *Global Competitiveness Index 2012-13*, Sweden has

maintained a strong focus on education over the years, enabling it to achieve a high level of technological readiness. The Swedish economy is export-oriented and is highly dependent on its industry maintaining a competitive edge in a global marketplace.

Due to its dependence on industry, there has been some concern regarding the plummeting interest in engineering and mathematics among students. The latest Eurostat figures show that there was a lower proportion of tertiary graduates in mathematics, science and technology in Sweden than the EU average.<sup>67</sup> The government has proposed increasing the time devoted to mathematics in compulsory education and measures have been taken to increase the number of university places for engineering.

According to the *2012 Small Business Act Fact Sheet*, Entrepreneurship is being incorporated into the curriculum as part of the reform of the Swedish school system. In 2012 the Swedish National Agency for Education funded 72 projects and five programmes to enhance the competence of teachers and the teaching of entrepreneurship in schools. Altogether, the Government is taking measures to tailor the education system to the industrial structure of the country. Furthermore, Swedish SMEs have a good record in the skills and innovation area. In particular, they are well ahead in the use of e-commerce, as more than half of Swedish SMEs purchase online (EU average: 28%).

### Sustainability

Sweden has one of the lowest rates of carbon emissions per capita in the EU. According to the latest statistics from *Energy in Sweden*, in 2010, 48% of Sweden’s energy came from renewable sources.<sup>68</sup> Sweden is making progress in meeting the Europe 2020 goal of 10% renewable energy in

<sup>64</sup> Government Offices of Sweden, *The Swedish Innovation Strategy*, p.15.

<sup>65</sup> Government Offices of Sweden, *The Swedish Innovation Strategy*, p.16.

<sup>66</sup> *Ett ramverk för innovationspolitiken, 2012*; Braunerhjelm, Eklund, Henrekson.

<sup>67</sup> According to EUROSTAT, in 2010 there were 15.2 graduates per 1000 of the population aged 20-29 in the EU-27, as compared with 14.0 in Sweden.

<sup>68</sup> The Swedish Energy Agency, *Energy in Sweden 2012*, p.6.

the transport sector.<sup>69</sup> It has set the ambitious goal of the country's vehicle stock being independent of fossil fuels by 2030.<sup>70</sup> However, the goal of reducing energy intensity by 20% from 2008 to 2020 may prove difficult to achieve.<sup>71</sup>

Industry accounted for 37% of Sweden's total energy use in 2010. Energy use by industry has remained relatively constant since 1970, despite increasing industrial output. From 1970 to 2010, the proportion of total energy use by industry provided by biofuels, peats, etc. increased from 21% to 37%.<sup>72</sup>

The use of taxation as an incentive for consumers and enterprises to change their consumption pattern in the direction of a green economy is well-developed. Sweden has committed itself to using taxation and other instruments to achieve the target for carbon dioxide emissions.

The transport sector is a challenge for policy as its energy use has increased since the 1970s.<sup>73</sup> Current policy efforts focus on modernisation, and the promotion of electric cars and biofuels in the sector. To further reduce carbon dioxide emissions, taxation measures and pilot programmes enhancing low-carbon technologies are being promoted by the government.<sup>74</sup>

### 4.27.3 Export performance

Business Sweden was created through a merger of the Swedish Trade Council and Invest Sweden. The aim of the organisation is to strengthen the image of Sweden as an attractive business partner and to make it easier for Swedish companies to reach

international markets and to create opportunities for small businesses to grow internationally.<sup>75</sup>

Sweden has a large and diversified export market stretching beyond Europe. The level of Swedish exports has helped the economy to perform well despite the euro-area downturn. Sweden's export market shares, however, are on a downward trend. Exports fell by 4% in 2012 due to weak external demand and the strengthening of the krona. Sweden's EU-27 exports decreased by 2%, while imports decreased by 5%.<sup>76</sup>

The trade balance has shown a surplus of around 7% of GDP since 2005. A structural shift appears to be taking place towards increased service exports. Traditionally, the surplus has been attributed to the goods trade but 2009 saw the surplus on services becoming larger than the goods surplus. In fact, Sweden's share in the global trade of goods has been in decline for a long time. This decline has been partly offset by the upward trend in services.<sup>77</sup>

Overall, Sweden's share of world exports has decreased from 1.5% in 1995 to 1.2% in 2010. Half of the loss occurred from 2005 to 2010. The product and country mix of Swedish exports is partly responsible for the decline. Around two-thirds of Swedish exports go to Europe. A shift has occurred from motor vehicles and electronic and telecommunication products to machinery and other equipment and chemicals. The share of high-tech exports remains constant at around 14% of total exports.<sup>78</sup>

<sup>69</sup> The Swedish Energy Agency, *Långsiktsprogno 2012*, p.8.

<sup>70</sup> Government Offices of Sweden, *The Swedish energy system*, accessed via <http://www.government.se/sb/d/16022/nocache/true/dictionary/true>.

<sup>71</sup> The Swedish Energy Agency, *Långsiktsprogno 2012*, p.8.

<sup>72</sup> The Swedish Energy Agency, *Energy in Sweden 2012*, p. 21, 28.

<sup>73</sup> The Swedish Energy Agency, *Energy in Sweden 2012*, p.22, 29.

<sup>74</sup> Government Offices of Sweden, *Energy Efficiency*, accessed <http://www.government.se/sb/d/16022/a/187772>.

<sup>75</sup> <http://www.business-sweden.se/en>.

<sup>76</sup> [http://www.scb.se/Pages/PressRelease\\_351447.aspx](http://www.scb.se/Pages/PressRelease_351447.aspx).

<sup>77</sup> European Commission, *European economy — Macroeconomic imbalances — Sweden*, Occasional Paper, July 2012, p.9.

<sup>78</sup> Ibid.

#### 4.27.4 Business environment and public administration

##### *Business environment*

Sweden continues to be one of the most competitive economies in the world, with a strong corporate sector. It ranks sixth in the World Economic Forum *Global Competitiveness Report 2013-14*.

In the spring fiscal policy bill, the Minister of Finance noted that the uncertain global economic situation required an adjustment to the growth forecast. The government projects a slower GDP growth of 1.2% in 2013 and of 2.2% in 2014. As a reaction to the deterioration in the labour markets, the government proposed creating an additional 14 000 vocational training places for adults in 2013-14, an additional 8 000 work experience and training places, and an additional 2 800 tertiary education places in graduate engineering and nursing programmes.

Companies are facing the problems of weaker demand from traditional export markets and the strong krona. Currency appreciation has an impact on profit margins and decisions on where companies invest in future production.

According to the 2013 World Bank *Doing Business* report, the time needed to start a business in Sweden is 16 calendar days, which is slightly longer than the EU average of 14 days and more than five times longer than the agreed Small Business Act target of three days by 2012.

Sweden scores very close to the EU average in terms of the time to close a business. A new law on insolvency was introduced aiming at easing the debt relief procedure. Under this new insolvency procedure, business owners and individuals who fall into personal insolvency will be allowed a five-year debt write-off programme. According to the *2012 SBA Fact Sheet*, small firms that become insolvent will be eligible for a simple and more rapid form of reorganisation.

Sweden is above average as regards access for small and medium-sized enterprises (SMEs) to public procurement and Swedish SMEs are more successful (47% vs. 38%) in winning public contracts than their EU peers. The 'Think small first' principle of the Small Business Act is well applied in policy-making and legislation.

The 2013 budget contained a number of proposals intended to improve competitiveness further. SEK 23 billion (EUR 2.67 billion) was allocated to reform measures to improve conditions for growth and competitiveness. The previous corporate tax rate of 26.3% (above the EU average) was reduced to 22% (slightly below the EU average). The government also proposed introducing tax credits for investors in order to stimulate access to finance for new and fast-growing companies. The government has announced its intention to increase research and innovation investment for 2013-16, in particular for university research and research-funding organisations. Compared with previous budgets, significantly higher expenditure ceilings for infrastructure investment — mainly road and rail — will be in place in 2013-25.

In recent years, several reforms have been implemented to facilitate company start-ups: the minimum capital has been reduced to SEK 50 000 (EUR 5 814); there is no longer a requirement to have an accountant in small firms; and improved social and income security for entrepreneurs has been introduced.

Value-added tax (VAT) for restaurants was reduced in 2012 from 25% to 12%. As the Commission has noted,<sup>79</sup> the effects of this on employment are uncertain, whereas the cost in terms of foregone VAT revenue is high.<sup>80</sup> Moreover, the measure contributes to further differentiation in VAT structure, therefore decreasing the efficiency of the tax.

<sup>79</sup> The Commission assessment in May 2013: [http://ec.europa.eu/europe2020/pdf/nd/swd2013\\_sweden\\_en.pdf](http://ec.europa.eu/europe2020/pdf/nd/swd2013_sweden_en.pdf)

<sup>80</sup> Estimated at 0.1 to 0.2 % of GDP, or between EUR 400m and EUR 800m.

The Swedish economy has traditionally been based on a strong manufacturing industry. However, the service sector has grown in importance and now accounts for approximately 65 % of growth in value added. Over 60 % of all enterprises are active in this sector.<sup>81</sup> Three out of four Swedes are employed in services. The knowledge-intensive service sector is growing and employment in it has increased by close to 20 % over the past 20 years.<sup>82</sup>

Since the mid-2000s, the rising surplus in services trade has fully compensated for the steady narrowing of the surplus in goods trade. This development can be attributed mainly to a structural shift in some industries away from goods production to service provision (the ‘servicification’ of manufacturing).<sup>83</sup>

#### Public administration

Sweden’s public administration is considered to be efficient and performs well.<sup>84</sup> According to the latest World Bank government effectiveness index, Sweden was in the 98th percentile of government effectiveness in 2011. Also, tax administration is efficient, with high compliance rates and low collection costs. The cost of tax administration is only 0.4 % of revenues, as compared with an EU average of 1.3 %.

Although the Swedish government undertook in 2006 to reduce the administrative burden for businesses by 25 % by 2010, the reduction achieved by 2010 was only just over 7%. Recognising the need to step up its efforts, the government has taken a series of initiatives, notably adopting a simplification programme for 2011-14. It has also commissioned a public inquiry, with a report to be published in November 2013, on the scope for reducing reporting requirements for companies.

In 2011, the government presented its focus areas for continued efforts to improve regulation in 2011–14. The work on better regulation has been broadened to include more aspects of the day-to-day reality of companies and the challenges faced by entrepreneurs. The work will focus on areas that are considered to offer the greatest potential for making a noticeable change for the better in day-to-day business:

- *Lower costs for companies:* Since 2006, the government has focused on reducing administrative costs and has now opted to increase the scope to cover other types of cost arising from regulations.
- *Reduced and simplified reporting requirements:* The aim is that, in future, businesses will in most cases need to submit information only once. The government is also carrying out an inquiry into the legal and technical requirements for creating a system in which information submitted by businesses can be used by several authorities, leading to information exchange between authorities.
- *Simpler procedures for contacting authorities at regional and local level:* The Swedish Agency for Economic and Regional Growth has been asked to take action to simplify conditions for businesses at municipal level. All county administrative boards have been asked to do the same at county level.
- *Action on proposals for better regulation from the business sector:* In 2012, the government decided on the terms of reference for a committee of inquiry aimed at providing feedback on the close to 500 proposals for better regulation submitted to government offices by the business sector since 2007.
- *A website where entrepreneurs can submit proposals,*<sup>85</sup> has been developed by the Swedish Agency for Economic and Regional Growth. Entrepreneurs can

<sup>81</sup> SCB:s Företagsdatabas.

<sup>82</sup> <http://www.almega.se/politik-och-ekonomi/statistik/tjanstesektorn>.

<sup>83</sup> European Commission, *European economy — Macroeconomic imbalances 2012 — Sweden*.

<sup>84</sup> European Commission (2012), *Excellence in public administration for competitiveness in EU Member States*.

<sup>85</sup> [www.enklareregler.se](http://www.enklareregler.se)



submit views and proposals for improved rules and procedures in contacts with government agencies.

- *Better impact assessments:* The Swedish Better Regulation Council was established in order to strengthen the work relating to impact assessments. In the 2013 budget, the government presented new objectives and follow-up measures for the process of better business regulation. All the objectives have a deadline of 2020, but are subject to continuous development and follow-up.

#### 4.27.5 Finance and investment

##### *Finance*

Overall, Swedish SMEs enjoy financing conditions that are better than the EU average. According to the 2012 Small Business Act (SBA) fact sheet, Sweden performs well in the area of access to finance. The indicators show that Swedish SMEs have a lower risk of seeing a loan application rejected and are satisfied with access to public financial support. As for venture capital, Swedish firms are more likely than the EU average to attract venture capital. Based on its assessment of legal rights, investor protection and the availability of credit information, the World Bank ranks Sweden as number 40 out of 185 for obtaining credits.

Almi Företagspartner is the public body that works to facilitate access of SMEs to finance in Sweden. It is state-owned and has 40 offices in the country. It offers credit, venture capital and counselling to SMEs. Almi provides financing to SMEs directly, not via intermediaries. It has own funds of EUR 550 million for lending and finances companies in all lines of business. In 2011, EUR 202 million in lending was provided, with about 60% going to micro companies. Write-offs constituted less than 2%.

##### *Investment*

The investment climate in Sweden is strong thanks to political stability, an efficient civil justice system and stable macro-economic conditions. Procedures for new investment in Sweden are straightforward.<sup>86</sup>

Measures have been taken to invest in innovation infrastructure in Sweden. They include the construction of the European Spallation Source (ESS), a materials research facility for scientific research using the neutron scattering technique. The budget for ESS is estimated at around SEK 11.9 billion (EUR 1.38 billion). The ESS is expected to be a world leader in material research and life sciences.

Another major project is the Max IV, a synchrotron light laboratory. Research will be carried out in the fields of accelerator physics and nuclear physics. It is believed that these research facilities will prove to be fertile ground for scientific breakthroughs in the years to come.

In addition, Sweden aims to create Europe's most attractive conditions for e-trade by 2015. To establish a digital market, the government intends to increase broadband access in rural areas.

#### 4.27.6 Conclusions

Sweden is one of the most competitive economies in the world, with a strong corporate sector. The 2013 budget contains a number of proposals intended to improve Sweden's competitiveness further, including reform measures to enhance the conditions for growth.

There is scope for improvement in the business environment. The 16 day business start-up time is slightly above the EU average of 14 days and over five times longer than the Small Business Act target of three days.

<sup>86</sup> Sweden Taxation and Investment, Deloitte 2012.

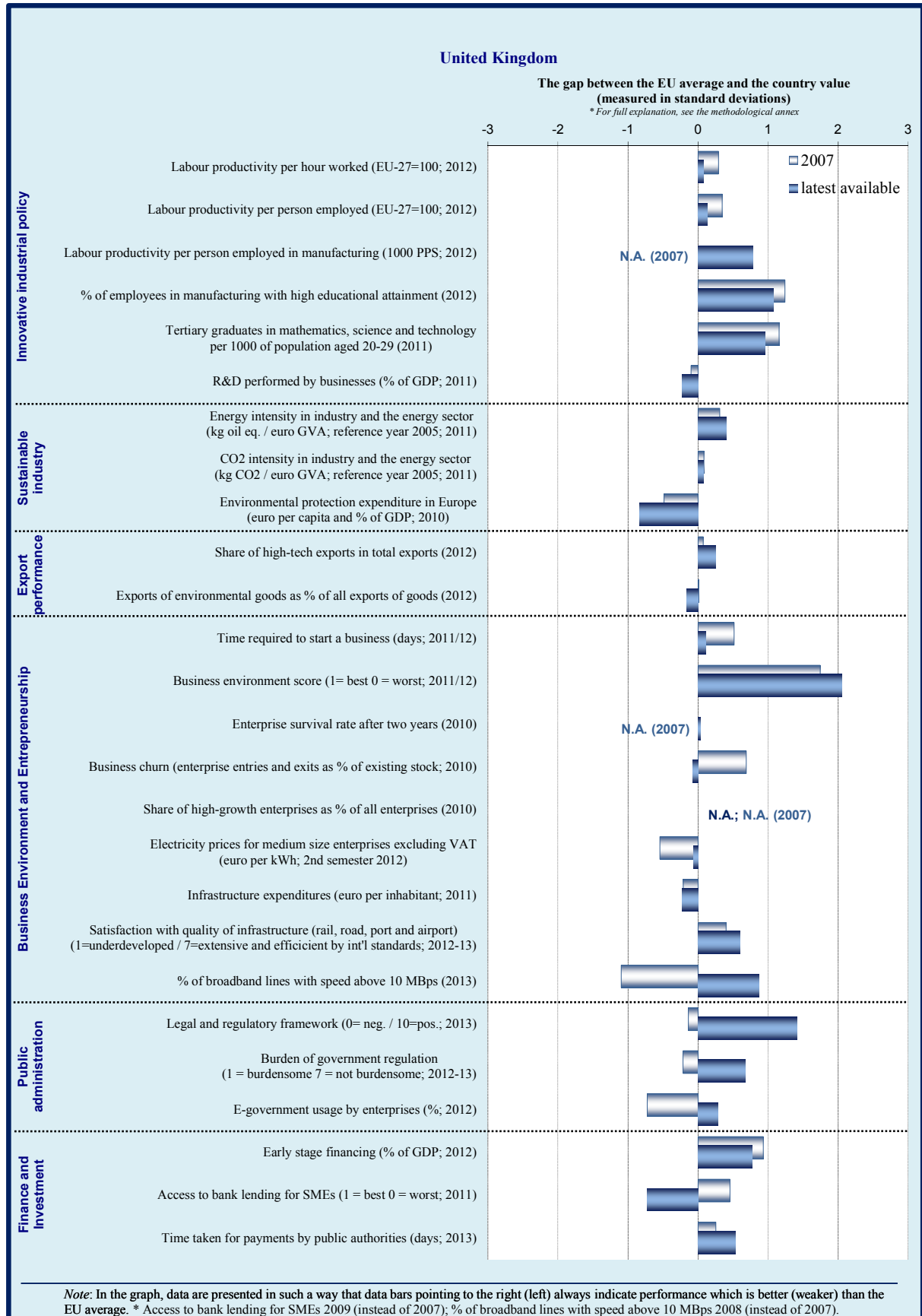
Sweden's innovation performance is one of the best in the world. According to the 2013 Innovation Union Scoreboard, Sweden continues to be the EU innovation leader. A new Research and Innovation Bill, which was adopted in October 2012, contains priorities for 2013-16 as part of the new innovation strategy aiming at strengthening the links between R&D investments and economic growth.

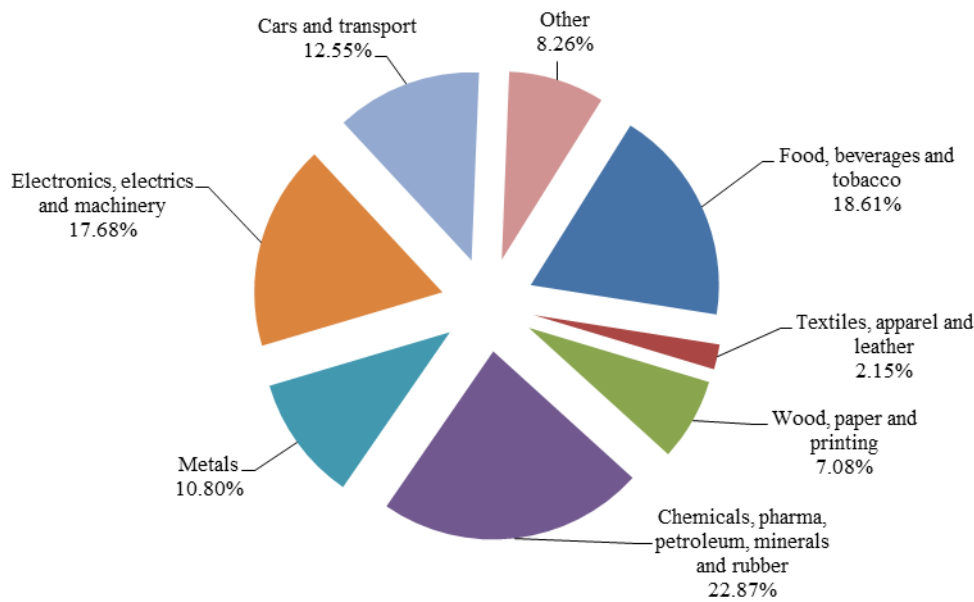
A challenge for the Swedish innovation system is to ensure that the high R&D expenditure is translated into commercially viable products that yield economic growth in the future. In addition, Sweden needs to safeguard domestic R&D investments as there are signs of increased investment and relocations abroad.

Sweden's public administration is considered to be efficient and performs well with regard to government effectiveness. The government has put forward a series of initiatives to simplify the administrative burden for businesses, taking into account companies' day-to-day reality.

The size of the export market has helped the economy to perform well despite the euro-area downturn. However, Sweden's export market shares are on a negative trend and companies are facing problems arising from weaker demand from traditional export markets. Exports fell by 4% in 2012 due to weak external demand and the strengthening of the Swedish currency. The uncertain global economic situation has slowed economic growth and required a downward adjustment of the economic growth forecast.

## 4.28. United Kingdom



**Figure 5.5: Manufacturing sectors – United Kingdom (2010)**

Source: Eurostat

#### 4.28.1 Introduction

Manufacturing plays a less important role in the UK than in the EU as a whole, contributing 10.7%<sup>87</sup> of the total value added compared with an EU average of 15.5%. However, companies in the technology sector are geared towards the high end, such as the R&D-intensive aerospace and pharmaceutical industries that make significant contributions to the manufacturing sector overall.

Labour productivity growth has been weak but, as is the case with exports, the broader data hide significant differences between industry and services. Between 2000 and 2010, labour productivity growth<sup>88</sup> in services was the seventh highest in the EU, while in industry it ranked sixteenth. The preponderance of high value-added financial services and structural problems in the industrial sector are likely to have contributed to this gap. The latest strong employment data,<sup>89</sup> combined with the weak GDP growth, are likely to further dampen overall labour productivity growth.

<sup>87</sup> 2011 Eurostat data.

<sup>88</sup> DG ECFIN data, based on public sources (Eurostat National Accounts and the OECD STAN database), cited in the UK in-depth review available at [http://ec.europa.eu/europe2020/pdf/nd/idr2013\\_uk\\_en.pdf](http://ec.europa.eu/europe2020/pdf/nd/idr2013_uk_en.pdf)

<sup>89</sup> In the third quarter of 2012 the employment rate reached 70.5%, the highest rate since 2008.

#### 4.28.2 Innovation, skills and sustainability

##### *Innovation*

The UK scores well on many research and innovation indicators, such as high quality publications, patents capable of generating significant revenues, and the share of the workforce employed in knowledge-intensive activities. This is despite lower than average (1.8% of GDP) spending on R&D,<sup>90</sup> which can be partly explained by the low share of the industrial sector in the economy, as services tend to be less research-intensive than manufacturing, but also because the UK seems better at creating knowledge than disseminating it across the economy, as suggested by the relatively low share of SMEs introducing product or process innovations and of sales of new-to-market or new-to-firm innovations.

Innovation is high on the government's agenda, featuring prominently in its 2012 Industrial Policy Strategy, and significantly, funding to research was not touched in recent budget cuts. Innovation is supported in various ways, ranging from the general to the very specific. R&D investment can benefit from substantial tax deductions, which can reach

<sup>90</sup> Figures from ONS.

130% of the total for large companies, and 225% for SMEs if they meet certain requirements, namely that they be used for technological and scientific innovation. Public procurement policies target specific innovative projects, such as the hybridisation of the existing truck fleet. There are many other initiatives and support schemes, including an interesting one to support disruptive technologies that have high growth potential, as identified by the Technology Strategy Board. The Board is also continuing to build a network of Catapult Centres to help commercialise research. Four Catapults Centres are already operational (high value manufacturing; cell therapy; offshore renewable energy; and satellite applications) and three others (connected digital economy; future cities; and transport systems) are set to start operating in 2013. The UK, according to a recent higher education ranking<sup>91</sup>, has four of the top five universities in Europe and thus can have a competitive advantage when trying to attract investors in high technology; increase interaction between researchers and companies; and commercialise output from publicly funded research. The good<sup>92</sup> collaboration between academia and business is supported through the Higher Education Innovation Fund, which can call on an annual budget of GBP 150 million. The Knowledge Transfer Networks, created by the Technology Strategy Board, have similar aims, and currently connect over 43 000 business members and 14 000 non-business ones.

Another of the government's goals is to encourage innovation among SMEs that are less likely to engage in innovative activities on their own. A national innovation voucher scheme has been created for this purpose. The business receiving the voucher, worth GBP 5 000, can use it to explore innovative ideas with a specialist firm or individual.

### *Skills*

The UK performs much better than the EU average (45.8% as against 34.6%) in terms of tertiary education, i.e. the percentage of 30-34 year-olds with a university or college degree. In terms of

entrepreneurship: the share of the population believing to have the required skills and knowledge to start a business is above the EU average (47 % as opposed to 42 %). However the UK underperforms in early school leaving has a relatively high number of adults with low basic skills, and there are shortcomings in the quality of vocational skills training. This leads to a labour market characterised by a shortage of workers with good vocational or technical skills, while at the same time some workers are over-qualified.

The government has consequently focused on school education and vocational training in recent years. There has been a significant increase in the number of apprenticeships, in particular at the higher vocational level, and further places will be available for graduate and postgraduate levels in engineering. This is important considering that higher level vocational skills are needed for the economy. In addition to apprenticeships, employers and universities will cooperate establishing 24 University Technical Colleges emphasising engineering and business skills.

Public-private partnerships are central to the reforms. Under the Employer Ownership programme, the government invests along with the employer to raise employees' skills and to provide incentives for employers to offer apprenticeships. The aim is to move away from a centrally planned approach and use sector-specific and local decision-making through the involvement of local enterprise partnerships. The belief is that colleges and training providers can better respond to the needs of trainees and employers. This approach should improve the availability of the right skills and thus boost productivity and job creation.

### *Sustainability*

The UK is likely to meet its carbon emission targets and the energy intensity and CO<sub>2</sub> intensity of its industry are lower than the EU average. The government confirmed its commitment to sustainable growth with several initiatives launched in 2012. The Electricity Market Reform programme that was part of the November 2012 energy bill provides certainty to investors, speeding up investment in new infrastructure. The government has also increased funding for low-carbon infrastructure through the levy control framework.

<sup>91</sup> <http://www.timeshighereducation.co.uk/world-university-rankings/2012-13/world-ranking/region/europe>.

<sup>92</sup> According to the WEF, the UK is the second highest performer in the world in this regard: <http://www.globalinnovationindex.org/gii/main/fullreport/files/Chap4/5/5.2.1.pdf>.

Under this scheme, spending will rise to GBP 7.6 billion in real terms in 2020/21.

The 'green deal' scheme has become operational. It enables energy efficiency in residential buildings to be improved without the need to pay the full cost upfront. Upgrades are financed through loans that are repaid through energy bills. The green deal is supported by a Green Investment Bank, for which state aid has been approved. The Green Investment Bank focuses on energy saving and emissions, but also promotes issues like better waste disposal. The government will provide the bank with funding of up to GBP 3 billion. Its impact will be leveraged as capital is being invested along with private investors. According to the bank, the ratio is currently at around one to three, as it has committed GBP 635 million in its first five months of operation for transactions totalling GBP 2.3 billion. Additional efforts will target the construction sector, following the low carbon roadmap for the built environment, as launched by the Green Construction Board. It provides for cooperation between government and industry with a view to achieving an 80% emissions reduction target by 2050.

Finally, the Office for Low Emission Vehicles is supporting initiatives to drive the emergence of a market for such vehicles. In particular, the office is prioritising the rollout of recharging infrastructure. This is also being supported by the Local Transport Sustainability Fund, which can call on GBP 600 million funding from the Department of Transport. There are additional incentives for buyers of low emission vehicles; GBP 300 million has been allocated to grants for plug-in cars and plug-in vans. These grants cover 25% and 20% respectively of the cost of eligible vehicles, in order to reduce the cost differential with conventional vehicles. Sustainable transportation is also supported by other measures to upgrade existing fleets. Local authorities often have their own schemes, ranging from financial incentives to free or subsidised parking and charging.

### 4.28.3 Export performance

The current account has gradually deteriorated over the last two decades, and has been consistently negative. However, here again the average figures mask a two-stream economy. The UK is the second

largest exporter of services in the world after the US, but has a large deficit in the trade of goods. In 2012, exports of goods accounted for 62%<sup>93</sup> of total British exports, while they make up 80% of global trade. The trade in goods is divided roughly equally between the EU and third countries, but three-fifths of services exports go outside the EU. As these markets are growing more rapidly, this suggests that there is still growth potential for banking, ICT and consultancy services.

The drop in value of the pound has not led to an increase in exports, contrary to the situation after the 1992 devaluation. This suggests that there are deeper causes such as a scarcity of critical skills, infrastructural bottlenecks, and a lack of access to finance for would-be exporters. On the last point, the government has taken action, as the UK Export Finance agency has been given funding to provide up to GBP 1.5 billion in loans for exports.

Furthermore, UK Trade & Investment, a government agency, has been given GBP 140 million more for the next two years to help SMEs in export markets, help them win contracts for high-value projects and promote inward investment. For example, more SMEs will be able to benefit from the 'Passport to Export' programme which aims to improve SMEs' chances of export success by helping them through a tailored, twelve month long assistance programme.

### 4.28.4 Business environment and public administration

#### *Business environment*

According to rankings, such as the World Bank's 'Doing Business' report, the UK is a consistent top performer in most aspects of the business environment. However, there are still problems concerning the planning rules and the slow and uncertain planning process, despite renewed efforts to remove bottlenecks. The government published a new National Planning Policy Framework in 2012 that replaced over 1000 pages of planning policy guidance with around 50, and introduced new pro-growth reforms such as the presumption in favour of sustainable development.

<sup>93</sup> Source of this and the following figures: Office for National Statistics.



Improving infrastructure has been recognised as a critical issue by the government. To coordinate and speed up procedures, a new infrastructure planning unit has been set up to liaise between local authorities and stakeholders. There are encouraging signs that this is having an effect, although planning is still difficult because of the political sensitivity at local level and the number of people involved. The National Infrastructure Plan was revised in December 2012 to focus more closely on growth. Most of the spending increases will go to energy and transport infrastructure. However, other priority areas will also benefit, including the roll-out of broadband to rural areas. A GBP 310 billion infrastructure funding pipeline will provide clarity for investors on the timeline of future projects. The UK authorities are launching initiatives to mobilise private financing and funding for specific infrastructure investment; such steps could reduce the gap between identified needs and committed funds, but their effectiveness remains to be proven.

#### *Public administration*

Firms are generally appreciative of the quality and speed of public administration. The government itself has set ambitious targets to further reduce the regulatory burden and to use e-government tools as much as possible. The 'one in-one out' regulatory target has now been substituted with the even more ambitious 'one in-two out' rule, whereby the government commits to adding new regulations only when a regulatory burden twice as heavy is removed. To help to deliver on this, the government has launched the 'red tape challenge', a project to analyse all government regulations to determine what is necessary and what can be made less burdensome. While 'one in, two-out' is an ambitious target to attain and measure, it helps guide and focus the authorities' efforts to reduce red tape, and makes it difficult to add burdensome new rules. Another strategy currently being implemented is 'digital by default', which underpins the government's digital strategy.<sup>94</sup>

SMEs in the UK find it more difficult than the EU average to access public contracts. The government has a target that 25 % of public procurement should go to SMEs. The current figure is 12 %. The government is reviewing its public procurement

system to make it easier to participate. For instance, a variety of pre-qualification questionnaires have been standardised. But there is resistance among the ministries and agencies to centralising procurement. Additional difficulties have been caused by the devolution of powers to local governments, as this makes it more difficult to streamline and coordinate public procurement.

#### 4.28.5 Finance and investment

Access to finance has become difficult in the recession, in particular due to the banking crisis. However, the situation differs depending on the kind of finance needed, and on the type of business needing it. Large firms can access the bond market at low rates, but SMEs rely mainly on bank loans, which are not easily obtained and only under restrictive conditions.

Several factors have contributed to this situation, including the lack of competition<sup>95</sup> in banking; the fact that non-banking sources of finance have been slow to emerge; constraints on demand and deleveraging in both the financial and non-financial sectors.

Both companies and the government believe that the Funding for Lending scheme, which aims to boost lending to the real economy, has had a positive effect. Wholesale bank funding costs have fallen by over 1 percentage point since June 2012 and there has been a significant increase in credit availability since the scheme started in August 2012, especially for larger firms. Improved credit conditions have been more visible in the construction and real estate sectors.<sup>96</sup> The government has announced expansions to the scheme to extend its scope to non-bank credit providers and to increase incentives to lend to SMEs.

SMEs still report problems in accessing credit, and the conditions for credit are worse than in other EU

<sup>94</sup> See <http://publications.cabinetoffice.gov.uk/digital/strategy/>.

<sup>95</sup> The six main players in the banking sector cover over 70 % of the market; there are encouraging but still small signs of others (Santander, Handelsbanken) increasing their attention to the company loan market.

<sup>96</sup> According to Bank of England data, lending to firms fell by 3.1 % in 2012, despite banks drawing almost £14 billion from the FLS between August and December. Funding can thus be considered to have flown into mortgages rather than company loans.

countries. In particular, the interest rate differential between smaller and larger loans is particularly high. The government has sought to make banks more resilient to shocks by requiring them to increase their capital. This has resulted in strict lending criteria which are keeping money from flowing to the real economy. The outcome is a complex situation whereby banks are under pressure to make their balance sheets more solid while at the same time numerous schemes to improve access to finance for companies are being introduced or expanded.

SMEs report difficulties in navigating the various support programmes, which include not only the access to finance schemes but also measures managed by specialised institutions (mainly UK Trade and Industry, and UK Export Finance), to help companies to export. The government plans to facilitate access by giving firms a full overview of the different programmes through gov.uk, its online portal for government services and information. The government also wants to work closely with professionals in the field, accountants in particular, and use the British Business Bank as a catalyst for all programmes and services. This bank will be a wholesale provider of funds, created by consolidating existing schemes. It has been given over GBP 1 billion of new capital to provide the economy with more long-term financing and to increase the diversity of financing options. It has been well received by the business community, and state aid approval is currently pending.

The government is planning to facilitate equity investment by expanding the tax relief offered to early stage investors. It has introduced the Seed Enterprise Investment Scheme, which provides income tax relief of 50% to individuals who invest in start-ups. It has also introduced more targeted schemes to encourage or scale-up equity investment such as the Enterprise Capital Fund which combines public and private funds to provide equity financing to SMEs in high-tech sectors.

There are indications that new financing alternatives are emerging. In particular, peer-to-peer lending is expanding, as are platforms that allow companies to exchanging their receivables for cash and supply-chain financing by larger companies, supported by the Business Finance Partnership. All these alternatives are still small in scale, but they show that there is potential for

further diversification. The government is also actively encouraging alternative forms of financing. Thus, there is potential for companies to access a more diverse range of financing options and to be better able to match their specific financing needs with the right instrument.

#### 4.28.6 Conclusions

The UK has a business-friendly environment, a generally efficient public administration, and a positive climate for research and innovation. In particular, the strong links between business and academia help to commercialise research and innovation. It would seem that the credit flow is improving, but so far the beneficiaries have been large firms and the real estate sector. SMEs continue to report difficulties in accessing finance; but though bank loans are hard to get, small signs of improvement are visible in the availability of alternative finance, including peer-to-peer lending and receivables exchange platforms.

The economy is advanced in terms of sustainability, and is less energy and resource intensive than the EU average. However, the industrial sector has problems with competitiveness that can be seen in the persistent deficit in the trade in goods. The main reasons are the infrastructure bottlenecks, a lack of skills (for instance in engineering), and a lack of finance for SMEs. However, the service sector is one of the most competitive in the world, and contributes significantly to the current account balance.

## 5 Annex: Methodology and indicators used

### 5.1. Definitions of the indicators

Name of Indicator	Definition
<b><i>The EU industry in 2013: state of play</i></b>	
Gross Value Added	<p>Gross Value Added (GVA) (ESA95, 8.11) is the net result of output valued at basic prices less intermediate consumption valued at purchasers' prices. Output (ESA95, 3.14) consists of the products created during the accounting period. Intermediate consumption (ESA95, 3.69) consists of the value of the goods and services consumed as inputs by a process of production, excluding fixed assets whose consumption is recorded as consumption of fixed capital. The goods and services may be either transformed or used up by the production process. GVA is also available broken down by industries according to NACE Rev. 1.1 in the breakdowns collection. GVA is calculated before consumption of fixed capital.</p> <p>Private industry is the part of a country's economy that consists of privately owned enterprises and is not state controlled, and is run by individuals and companies for profit. The private sector encompasses all for-profit businesses that are not owned or operated by the government. Companies and corporations that are government run are part of what is known as the public sector.</p> <p>Constant prices are obtained by directly factoring changes over time in the values of flows or stocks of goods and services into two components reflecting changes in the prices of the goods and services concerned and changes in their volumes (i.e. changes in "constant price terms"); the term "at constant prices" commonly refers to series which use a fixed-base Laspeyres formula.</p> <p>Current price refers to the most recent period for which an indicator has been computed or is being computed. However, the term is widely used to refer to any period that is compared with the price reference or indicator reference period.</p> <p><i>Source: Eurostat</i></p>
Evolution of investment components in the EU (index)	<p>Evolution of investment components in the EU is measured by the evolutions of the gross fixed capital formation (GFCF) where GFCF consists of resident producers' investments, deducting disposals, in fixed assets during a given period. It also includes certain additions to the value of non-produced assets realized by producers or institutional units. Fixed assets are tangible or intangible assets produced as outputs from production processes that are used repeatedly, or continuously, for more than one year. Data have been seasonally adjusted and adjusted by working days in millions of national currency, chain-linked volumes; reference year 2005.</p> <p><i>Source: Eurostat</i></p>
Manufacturing production indexes	<p>The objective of the production index is to measure changes in the volume of output at close and regular intervals, normally monthly. It provides a measure of the volume trend in value added over a given reference period. The production index is a theoretical measure that must be approximated by practical measures.</p>

	<p>Value added at basic prices can be calculated from turnover (excluding VAT and other similar deductible taxes directly linked to turnover), plus capitalised production, plus other operating income plus or minus the changes in stocks, minus the purchases of goods and services, minus taxes on products which are linked to turnover but not deductible plus any subsidies on products received. The division of production in construction between building construction and civil engineering is based on the classification of types of construction (CC).</p> <p>The reference period is year 2010 and the unit is index or percentage change (%).</p> <p><i>Source: Eurostat, Bureau of Economic Analysis (BEA), Ministry of Economy, Trade and Industry Japan</i></p>
Manufacturing employment	<p>Manufacturing employment measures employment expressed in person in private industry subsection manufacturing. Population and employment are auxiliary indicators in the national accounts (macroeconomic indicators, which provide an overall picture of the economic situation and are largely used for economic analysis and forecasting).</p> <p><i>Source: Eurostat, Bureau of Labour (BEA), Ministry of Economy, Trade and Industry Japan</i></p>
Year-to-year growth rate of loans to non-financial corporations	<p>Year-to-year growth rate of loans to non-financial corporations is annual growth of the balance sheet item: loans to non-financial corporations where the balance sheet is a financial statement that summarizes a company's assets, liabilities and shareholders' equity at a specific point in time. The balance sheet must follow the following formula: Assets = Liabilities + Shareholders' Equity.</p> <p>BSI statistics refer to either the aggregated or the consolidated balance sheet of the Monetary Financial Institutions (MFI) sector. The aggregated balance sheet is the sum of the balance sheets of all the MFIs resident in the euro area. The consolidated balance sheet is obtained by netting the aggregated balance sheet positions between MFIs in the euro area. The consolidated balance sheet provides the basis for the regular analysis of euro area monetary aggregates and counterparts.</p> <p>The sector non-financial corporations consists of institutional units whose distributive and financial transactions are distinct from those of their owners and which are market producers, whose principal activity is the production of goods and non-financial services.</p> <p>The growth rate computations refer to an index of notional stocks, rather than to the stock data directly. The index of notional stocks is computed as a chain index <math>I(t)=I(t-1) \times [1+F(t)/S(t-1)]</math>, where <math>F(t)</math> are transactions during the period and <math>S(t-1)</math> are stocks at the end of the previous period.</p> <p>Data collections are based on a census rather than a sample.</p> <p><i>Source: ECB, Federal Reserve, Bank of Japan</i></p>
Bank nonperforming loans to total gross loans	<p>Bank nonperforming loans to total gross loans are the value of nonperforming loans divided by the total value of the loan portfolio (including nonperforming loans before the deduction of specific loan-loss provisions). The loan amount recorded as nonperforming should be the gross value of the loan as recorded on the balance sheet, not just the amount that is overdue.</p> <p>Nonperforming loan is a sum of borrowed money upon which the debtor has not made scheduled payments for at least 90 days.</p>

	<i>Source: World Bank</i>
Percentage of non-performing loans by sector of activity	<p>Percentage of non-performing loans by sector of activity are the values of nonperforming loans divided by the total value of the loans in a breakdown by sector of activity (industry, construction, services and real estate) and the non-performing loan is a sum of borrowed money upon which the debtor has not made a schedules payments for at least 90 days.</p> <p><i>Source: Bank of Spain</i></p>
Extra and intra EU trade	<p>International trade in goods statistics cover both extra- and intra-EU trade: Extra-EU trade statistics cover the trading of goods between Member States and a non-member countries. Intra-EU trade statistics cover the trading of goods between Member States. "Goods" means all movable property including electricity measured in volume indices (2000=100).</p> <p><i>Source: Eurostat, CPB World Trade Monitor</i></p>
EU unit price of exports	<p>Unit value is the expenditure or value of production of an item divided by the quantity.</p> <p>Foreign trade unit value indices are indicators describing price dynamics of exported and imported goods. The export/import unit value index characterises changes in the price level of exported and imported goods within the reporting period against the base period. The unit value index is a “price” index that measures average value changes in a heterogeneous cluster of units. Therefore, it may be influenced by changes both in the composition of this cluster and in individual prices.</p> <p>Indices are calculated by Eurostat, using a common methodology and computer programs: monthly raw data are processed at the most detailed level in order to calculate elementary unit-values defined by trade value/quantity. These unit-values are divided by the average unit-value of the previous year to obtain elementary unit-value indices, from which outliers are detected and removed. Elementary unit-value indices are then aggregated over countries and commodities, by using the Laspeyres, Paasche and Fisher formulae. Finally, the Fisher unit-value indices are chained back to the reference year (2000=100) and are used to approximate the import and export price movements. Value-indices are calculated as the percentage change between the trade value of the current month and the average monthly trade value of the previous year. These value indices are used to derive volume indices as follows: value index = unit-value index x volume index. The growth rates of unit-value and volume indices enable the user to decompose value changes into price and volume components.</p> <p><i>Source: Eurostat</i></p>
Export revenue / operating average ratio of SMEs	<p>Export revenue divided by the operating average ratio of SMEs</p> <p>Revenue is calculated by multiplying the price at which goods or services are sold by the number of units or amount sold. It is the “top line” or “gross income” figure from which costs are subtracted to determine net income.</p> <p>Operating ratio shows the efficiency of a company’s management by comparing operating expenses to net sales or revenue. The smaller the ratio, the greater the organization’s ability to generate profit if revenues decrease.</p> <p>Operating expenses refer to the on-going cost of running a product, business or system and is a category of expenditure that a company</p>

	<p>incurs as a result of performing its normal business operations.</p> <p><i>Source: AMADEUS, own calculations</i></p>
Exports of environmental goods	<p>Intra- and extra-EU-27 exports of goods from ‘eco-industries’ divided by total intra- and extra-EU-27 exports of goods (in nominal values).</p> <p>The notion of ‘eco-industry’ refers to sectors whose products measure, prevent, limit, minimise or correct environmental damage. The trade codes considered to cover eco-industry goods are those identified in the <a href="#">Ecorys study on the ‘Competitiveness of the EU eco-industry’</a> (pages 190/191) of 22 October 2009, carried out for DG Enterprise and Industry.</p> <p>Due to the reclassification of the Comext products codes, please find the updated list below (TABLE: Comext eco-products codes and descriptions)</p> <p><i>Source: European Commission (DG Enterprise and Industry) calculations on the basis of Eurostat/COMEXT data</i></p>
Current account adjustment (% GDP)	<p>Current account adjustment is expressed as the ratio between net balance of payments and Gross Domestic Product main components at current prices.</p> <p>The balance of payments (BoP) is a statistical statement that systematically summarises, over a given period of time, all the transactions of an economy with the rest of the world. The balance of payments records all economic transactions undertaken between the residents and non-residents of a country during a given period. A transaction is defined in the BPM5 as an economic flow that reflects the creation, transformation, exchange, transfer, or extinction of economic value and involves changes in ownership of goods and/or financial assets, the provision of services, or the provision of labour and capital.</p> <p>Gross Domestic Product (GDP) is the monetary value of all the finished goods and services produced within a country's borders in a specific time period, though GDP is usually calculated on an annual basis. It includes all of private and public consumption, government outlays, investments and exports less imports that occur within a defined territory.</p> <p><i>Source: Eurostat</i></p>
Change in demand for skills in the manufacturing sector between 2010 and 2020	<p>Comparison of change in demand for skills between 2010 and 2020 in manufacturing sector with distinction for food, drink and tobacco, engineering and rest of manufacturing, dynamics manufacturing was also compared with change in all sectors.</p> <p><i>Source: CEDEFOP</i></p>
Skill and labour shortages in European manufacturing companies	<p>Skill and labour shortage in European manufacturing companies expressed as percentage excess of demand over supply of available workforce with distinction between skilled and low skilled and unskilled.</p> <p>Labour shortage indicator (LCI) shows proportion of manufacturing companies that consider labour shortages, regardless of skill level, being a factor so severe that it may limit their production.</p> <p><i>Source: Eurofund, “European Company Survey”</i> <i>European Commission “Business Survey”</i></p>



Unit labour cost	<p>Unit labour costs (ULC) measure the average cost of labour per unit of output and are calculated as the ratio of total labour costs to real output.</p> <p>In broad terms, unit labour costs show how much output an economy receives relative to wages, or labour cost per unit of output. ULCs can be calculated as the ratio of labour compensation to real GDP. It is also the equivalent of the ratio between labour compensation per labour input (per hour or per employee) worked and labour productivity.</p> <p><i>Source: OECD</i></p>
Fixed capital formation	<p>Evolution of investment components in the EU is measured by the evolutions of the <b>gross fixed capital formation (GFCF)</b> where GFCF consists of resident producers' investments, deducting disposals, in fixed assets during a given period. It also includes certain additions to the value of non-produced assets realized by producers or institutional units. Fixed assets are tangible or intangible assets produced as outputs from production processes that are used repeatedly, or continuously, for more than one year. Data have been seasonally adjusted and adjusted by working days in millions of national currency, chain-linked volumes, reference year 2005.</p> <p><i>Source: Ameco</i></p>
Real effective exchange rate	<p>Nominal effective exchange rate deflated by nominal unit labour costs (total economy) relative to a panel of 36 countries (EU-27 + 9 other industrial countries: Australia, Canada, United States, Japan, Norway, New Zealand, Mexico, Switzerland, and Turkey). 1999=100 for all countries. A rise in the index suggests deterioration in competitiveness. The figure for each country is calculated against the rest of the countries belonging to the panel. The EU aggregate figure is calculated against the non-EU-27 countries belonging to the panel.</p> <p><i>Source: European Commission (DG ECFIN)</i></p>
Manufacturing and Construction (as % of GDP at factor costs)	<p>Share of manufacturing and construction in Member States' total value added (based on Gross value added at basic prices).</p> <p><i>Source: Eurostat</i></p>
Country share in EU manufacturing	<p>Share of manufacturing value added by Member State in total EU manufacturing value-added.</p> <p><i>Source: Eurostat</i></p>
Innovation Union Scoreboard	<p>Composite indicator built on the basis of 24 indicators (0=lowest possible performance, 1=maximum possible performance).</p> <p><i>Source: Innovation Union Scoreboard 2013; European Commission</i></p>
Energy intensity in industry (including construction) and the energy sector	<p>Energy consumption in kg of oil equivalent per euro of gross value-added (chain-linked volumes, reference year 2000, at 2000 exchange rates).</p> <p>Due to data availability and to the structure of the Eurostat database on energy and national accounts and of European Economic Area greenhouse gas inventories, the indicators of energy and carbon intensity include a broader, consistent definition of industry and provide information for all Member States (with the exception of Malta) for the most recent available year. Both aggregates (energy consumption and emissions) are related to the consistent gross value added data at constant prices (2000 as the reference year).</p> <p>For ease of comparability between sectors and countries, energy intensity is measured as the ratio between consumption and total gross value added in the energy sector and industry (including construction</p>

	<p>and the non-energy sector). In particular, energy intensity calculations refer to final energy consumption in industry (including construction), final non-energy consumption (i.e. for chemical reduction activities) and consumption in the energy sector.</p> <p>Energy consumption refers to: B_101800 - Final energy consumption in industry (including construction) + B_101600 - Final Non-energy consumption + B_101300 - Consumption in Energy Sector.</p> <p>GVA refers to NACE sections C: Mining and Quarrying, D: Manufacturing, E: Electricity, Gas and Water Supply and F: Construction.</p> <p><i>Source: Eurostat ('environment and energy' and 'national accounts')</i></p>
<b>Innovative industrial policy</b>	
Labour productivity per hour worked	<p>Gross Domestic Product in Purchasing Power Standards per hour worked relative to EU-27 (EU-27=100)</p> <p><i>Source: Eurostat</i></p>
Labour productivity per person employed	<p>Gross Domestic Product in Purchasing Power Standards per person employed relative to EU-27 (EU-27=100)</p> <p><i>Source: Eurostat</i></p>
Unit labour costs in manufacturing	<p>Development (2000=100) of the following ratio: Total compensation of employees in manufacturing (in nominal values) divided by total valued added in manufacturing (in constant prices).</p> <p><i>Source: OECD</i></p>
Tertiary graduates in science and technology per 1000 of population aged 20-29	<p>Number of new science and technology graduates (levels 5 and 6 of the International Standard Classification of Education-ISCED97) divided by 20-29 years old population and then multiplying by 1000.</p> <p>The term 'science' includes the following fields of education (ISCED): life sciences, physical sciences, mathematics, statistics and computing, while technology refers to graduates in engineering, manufacturing and construction.</p> <p>The indicator includes new tertiary graduates in a calendar year from both public and private institutions completing graduate and post graduate studies compared to the age group of 20-29 years old population that corresponds to the typical graduation age in most countries.</p> <p><i>Source: Eurostat</i></p>
R&D performed by businesses	<p>The indicator covers all expenditures for R&amp;D performed within the business enterprise sector (BERD) on the national territory during a given period, regardless of the source of funds.</p> <p>The data on this indicator are gathered by Eurostat which applies the guidelines laid out in the Frascati Manual, the 'Proposed standard practice for surveys of research and experimental development' (OECD, 2002).</p> <p>Note: Gross domestic expenditure on R&amp;D is composed of Business enterprise expenditure on R&amp;D, Higher education expenditure on R&amp;D, Government expenditure on R&amp;D and Private non-profit expenditure on R&amp;D.</p> <p><i>Source: Eurostat</i></p>
Public R&D expenditure	<p>The indicator covers all R&amp;D expenditures in the government sector (GOVERD) and the higher education sector (HERD).</p>

	<i>Source: Eurostat</i>
Key enabling technologies (KETs)	<p>KETs are composed of six core technologies: micro-/nanoelectronics, nanotechnology, photonics, advanced materials, industrial biotechnology and advanced manufacturing technologies.</p> <p><i>Source: Calculations by European Commission/ZEW/NIW based on Patstat and UN Comtrade data</i></p>
<b>Export performance</b>	
Total exports as % of GDP	<p>Value of Intra and Extra EU exports by Member State as % of GDP.</p> <p><i>Source: Eurostat</i></p>
Country share of total EU goods and services exports	<p>International trade in goods and services covers both extra- and intra-EU trade. Extra-EU trade statistics cover the trading of goods between Member States and non-member countries. Intra-EU trade statistics cover the trading of goods between Member States. ‘Goods’ means all movable property including electricity.</p> <p><i>Source: Eurostat</i></p>
Domestic value added of exports	<p>Value Added Export Ratio – Total domestic value added share of gross exports, %.</p> <p><i>Source: OECD – WTO; TiVA (Trade in Value Added)</i></p>
Knowledge intensive exports	<p>Export values of Non-financial knowledge intensive services divided by total exports of services, and export values of Medium and Hi-tech goods divided by total exports of goods.</p> <p><u>Non-financial knowledge intensive services</u></p> <p>Following the same definition as that used in the Innovation Union Scoreboard, Non-financial knowledge intensive services (NFKIS) include the following: passenger and freight services for air and sea transport, space transport, communications services, insurance services, computer services, operational leasing services, legal, accounting, management consulting and public relations, advertising, market research and public opinion polling, research and development, architectural, engineering, and other technical business services.</p> <p><i>Source: data are calculated from the United Nations Balance of Payments (exports of services)</i></p> <p><u>Medium and Hi-Tech goods</u></p> <p>Following the same definition as that used in the Innovation Union Scoreboard, Medium and Hi-Tech goods (MHT) include (SITC rev 3 code in brackets): Synthetic and other man-made fibres suitable for spinning (266-267), Alcohols, phenols, Carboxylic acids and their derivatives (512-513), Radioactive and associated materials (525), Pigments, paints, varnishes and related materials (533), Medicinal and pharmaceutical products (54), Perfumery, cosmetic or toilet preparations (553-554), fertilisers (562), plastics (57-58), Insecticides, rodenticides, fungicides, herbicides, anti-sprouting products and plant-growth regulators, disinfectants and similar products (591), Explosives and pyrotechnic products (593), Prepared additives for mineral oils and the like; prepared liquids for hydraulic transmission; anti-freezing preparations and prepared de-icing fluids; lubricating preparations (597), miscellaneous chemical products n.e.s. (598), articles of rubber, n.e.s. (629), fabrics, woven, of man-made textile materials (not including narrow or special fabrics) (653), Pig-iron and the like, ingots and other primary forms, tubes, pipes, hollow profiles, pipe fittings of</p>

	<p>iron or steel (671-672-679), power-generating machinery and equipment and machinery specialised for particular industries (71-72), machine tools except parts (731-733-737), general industrial machinery and equipment, n.e.s. (74), office machines and automatic data-processing machines (75), telecommunications and sound-recording and reproducing apparatus and equipment (76), electrical machinery, apparatus and appliances, n.e.s., and electrical parts (77), road vehicles (including air-cushion vehicles) (78), other transport equipment (79), sanitary, plumbing and heating fixtures and fittings, n.e.s. (812), professional, scientific and controlling instruments and apparatus, n.e.s. (87), photographic apparatus, equipment and supplies and optical goods, n.e.s.; watches and clocks (88) and miscellaneous manufactured articles, n.e.s. (89).</p> <p><i>Source: data are compiled from the UN database Comtrade (exports of goods).</i></p>
Knowledge-intensive services exports as % of total services exports:	<p>Numerator: Exports of knowledge-intensive services are measured by the sum of credits in EBOPS (Extended Balance of Payments Services Classification) 207, 208, 211, 212, 218, 228, 229, 245, 253, 260, 263, 272, 274, 278, 279, 280 and 284.</p> <p>Denominator: Total services exports as measured by credits in EBOPS 200</p> <p>The indicator measures the competitiveness of the knowledge-intensive services sector. Knowledge-intensive services are defined as NACE classes 61-62 and 64-72. These can be related to the above-mentioned EBOPS classes using the correspondence table between NACE, ISIC and EBOPS as provided in the UN Manual on Statistics of International Trade in Services (UN, 2002).</p> <p><i>Source: UN, Eurostat</i></p>
Share of high-tech exports	<p>Share (in %) of intra- and extra-EU-27 exports of all high technology products in total intra- and extra-EU-27 exports.</p> <p>High technology products comprise: Aerospace, Computers office machines, Electronics-telecommunications, Pharmacy, Scientific instruments, Electrical machinery, Chemistry, Non-electrical machinery, Armament.</p> <p><i>Source: Eurostat</i></p>
<b>Business Environment and entrepreneurship</b>	
Business environment score	<p>Score calculated from Doing business data with seven indicators: Starting a business, Dealing with construction permits, Registering property, Getting credit, Protecting investors, Enforcing contracts and Resolving insolvency. Each indicator is normalised to a figure between 0 and 1, where 0 is the worst possible member State performance and 1 the best one. The country score for a given year is the simple average of the seven figures.</p> <p><i>Source: World Bank Doing Business 2013</i></p>
Performance in business environment indicators	<p>Calculation done on the basis of World Bank Doing business data with seven indicators: Starting a business, Dealing with construction permits, Registering property, Getting credit, Protecting investors, Enforcing contracts and Resolving insolvency.</p> <p><i>Source: World Bank Doing Business 2013</i></p>
Electricity prices for medium-sized enterprises	<p>Average national price in Euro per kWh excluding taxes, applicable for the first semester of each year for medium-sized industrial consumers</p>

	<p>(annual consumption between 500 and 2000 MWh). The indicator does not cover small enterprises for reasons of data availability, nor large enterprises, since the latter often have individual contracts with energy providers. Prices refer to the second half of the year.</p> <p><i>Source: Eurostat</i></p>
Satisfaction with the quality of infrastructure	<p>Average mark given by business executives in a World Economic Forum survey to the quality of rail, roads, ports and airports (1 = underdeveloped; 7 = extensive and efficient by international standards).</p> <p><i>Source: Global Competitiveness Report 2013-14 of the World Economic Forum.</i></p>
Access to bank lending for SMEs	<p>Score calculated from the Eurobarometer survey data with six indicators expressed as the percentage of respondents to the following questions: Net increase in the need for bank loans in the past six months; Not applying for a loan in the past six months for fear of rejection; Applying for a loan in the past six months but being rejected, or rejecting the offer because of too high costs; Net improvement in the availability of loans in the past six months; Net increase in the size of bank loans in the past six months; Net improved willingness of banks to provide a loan in the past six months. 0 indicates the worst possible situation and 1 the best possible one.</p> <p><i>Source: Flash Eurobarometer</i></p>
Investment in equipment, as % of GDP	<p>Gross fixed capital formation at current prices - equipment (UIGE; 3 years aggregate) divided by Gross domestic product at current market prices (UVGD; 3 years aggregate).</p> <p><i>Source: AMECO, Eurostat</i></p>
Labour productivity in manufacturing per person employed	<p>Gross value added in Purchasing Power Standards per person employed</p> <p><i>Source: Eurostat</i></p>
Percentage of employees in manufacturing with high educational attainment	<p>Data are calculated from the annual labour force survey using the International Standard Classification of Education (ISCED), levels 5 and 6 – i.e. employees in manufacturing with first and second stages of tertiary education.</p> <p><i>Source: Eurostat</i></p>
Starting a business (days)	<p>Time needed to start a business, recorded in calendar days. It is the median duration that incorporation lawyers indicate as necessary. It is assumed that the minimum time required for each procedure is one day.</p> <p><i>Source: World Bank Doing Business 2013</i></p>
Enterprise survival rate after 2 years	<p>Number of enterprises started in year <math>t</math> and which still existed in year <math>(t+2)</math>, divided by the total number of enterprises that started in year <math>t</math></p> <p><i>Source: Eurostat</i></p>
Business churn	<p>Sum of the number of enterprise starts and exits (“births” plus “deaths”) in the reference period (year <math>t</math>), divided by the total number of enterprises active in year <math>t</math>.</p> <p><i>Source: Business Demography (Eurostat)</i></p>
Share of high-growth enterprises	<p>Enterprises with average annualised growth greater than 20 % in the number of employees, over a three-year period, and with ten or more employees at the beginning of the observation period, divided by the total number of active enterprises at the beginning of the three year</p>

	<p>period.</p> <p><i>Source : Eurostat</i></p>
Venture capital	<p>Venture Capital: Data measure all venture capital investment as a percentage of GDP.</p> <p><i>Source: European Private Equity and Venture Capital Association (EVCA)</i></p>
Licenses	<p>The indicator measures the time (in days) required to obtain licenses following the Commission's methodology and models, i.e.: the licenses required for 5 'benchmark' model companies: Hotel with a restaurant, Plumbing company, Wholesale or retail distributor, Manufacturer of steel products, Manufacturer of small IT devices.</p> <p><i>Source: Graph adapted by the European Commission based on the study: Business Dynamics: Start-ups, Business Transfers and Bankruptcy, Final Report, January 2011</i></p>
Infrastructure expenditures per inhabitant	<p>Sum of investment and maintenance expenditures on rail, road, inland waterways, maritime ports and airports infrastructure.</p> <p><i>Source: OECD International Transport Forum Statistics</i></p>
Availability of high-speed broadband infrastructure	<p>Percentage of broadband lines with speed above 10 Mbps</p> <p><i>Source: European Commission, DG INFSO Communications Committee Working Document</i></p>
Services in the overall economy	<p>Share of economic sectors in total gross value added (at basic prices) belonging to the NACE categories: A+B; C+D+E; F; G+H+I; J; K; L+M+N+O+P+Q</p> <p><i>Source: Eurostat, National Accounts</i></p>
<b><i>Sustainable industry</i></b>	
Employment in knowledge-intensive activities (manufacturing and services) as % of total employment	<p>Employment in knowledge-intensive activities (manufacturing and services) as a % of total employment where knowledge-intensive activities have been classified by Eurostat:</p> <p>Knowledge-Intensive Activities (KIAs) are defined as economic sectors in which more than 33 % of the employed labour force has completed academic-oriented tertiary education (i.e. at ISCED 5 and 6 levels). They cover all sectors in the economy, including manufacturing and services sectors, and can be defined at two and three-digit levels of the statistical classification of economic activities.</p> <p><i>Source: Eurostat, Innovation Union Scoreboard</i></p>
License and patent revenues from abroad as % of GDP	<p>The export part of international transactions in royalties and license fees.</p> <p><i>Source: Eurostat, Innovation Union Scoreboard</i></p>
Energy intensity in industry (including construction) and the energy sector	<p>Energy consumption in kg of oil equivalent per euro of gross value-added (chain-linked volumes, reference year 2000, at 2000 exchange rates).</p> <p>Due to data availability and to the structure of the Eurostat database on energy and national accounts and of European Economic Area greenhouse gas inventories, the indicators of energy and carbon intensity include a broader, consistent definition of industry and provide information for all Member States (with the exception of Malta) for the most recent available year. Both aggregates (energy consumption and emissions) are related to the consistent gross value added data at constant prices (2000 as the reference year).</p>



	<p>For ease of comparability between sectors and countries, energy intensity is measured as the ratio between consumption and total gross value added in the energy sector and industry (including construction and the non-energy sector). In particular, energy intensity calculations refer to final energy consumption in industry (including construction), final non-energy consumption (i.e. for chemical reduction activities) and consumption in the energy sector.</p> <p>Energy consumption refers to: B_101800 - Final energy consumption in industry (including construction) + B_101600 - Final Non-energy consumption + B_101300 - Consumption in Energy Sector.</p> <p>GVA refers to NACE sections C: Mining and Quarrying, D: Manufacturing, E: Electricity, Gas and Water Supply and F: Construction.</p> <p><i>Source: Eurostat ("environment and energy" and "national accounts")</i></p>
CO2 intensity in industry (including construction) and the energy sector	<p>CO2 emissions in kg per euro of gross value-added (chain-linked volumes, reference year 2000, at 2000 exchange rates).</p> <p>The carbon intensity indicator refers to CO2 emissions in industry (including construction), from industrial processes and from solvent and other product use in industry, and CO2 emissions from energy industries.</p> <p><i>Source: European Environmental Agency – for the figures on the CO2 emissions. The relevant categories are 1.A.1. (Energy Industries) + 1.A.2 (Manufacturing Industries and Construction) + 2. (Industrial Processes) + 3 (Solvent and Other Product Use). Eurostat – for the figures regarding GVA. GVA refers to NACE sections C: Mining and Quarrying, D: Manufacturing, E: Electricity, Gas and Water Supply and F: Construction.</i></p>
Environment Protection Expenditures in industry (% of GDP)	<p>The Classification of Environmental Protection Activities (CEPA 2000) distinguishes nine environmental domains: protection of ambient air and climate; wastewater management; waste management; protection and remediation of soil, groundwater and surface water; noise and vibration abatement; protection of biodiversity and landscape; protection against radiation; research and development and other environmental protection activities. Industry excludes recycling.</p> <p><i>Source: Eurostat</i></p>
<b>Public administration</b>	
Government effectiveness	<p>Government effectiveness captures perceptions of the quality of the public service, its degree of independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies (scale 0 to 100, 100 = best).</p> <p><i>Source: World Bank – Worldwide Governance Indicators (2010; 2011)</i></p>
Incidence of innovations in public administrations, by type (%)	<p>Indicator based on the answers to the following three questions:</p> <p>Q1. Since January 2008, did your organisation introduce any new or significantly improved services?</p> <p>Q5. Since January 2008, did your organisation introduce any new or significantly improved methods of communicating your activities to the public such as:</p> <ul style="list-style-type: none"> <li>• New and improved methods of promoting your organisation</li> </ul>

	<p>or your services;</p> <ul style="list-style-type: none"> <li>• New or improved methods of influencing the behaviour of users, citizens or others;</li> <li>• First time commercialisation (for sale) of services or goods?</li> </ul> <p>Q6. Since January 2008, did your organisation introduce any new or significantly improved processes or organisational methods, such as:</p> <ul style="list-style-type: none"> <li>• New or improved methods of providing services or interacting with your users;</li> <li>• New or improved delivery or logistics systems for your inputs;</li> <li>• New or improved supporting activities such as maintenance systems, purchasing, accounting of computing systems, etc.;</li> <li>• New or improved management systems;</li> <li>• New or improved methods of organising work responsibilities of decision making?</li> </ul> <p>Survey covered 4000 randomly selected public administration organisations with at least 10 employees ((defined as NACE 84.11 (General public administration activities) and NACE 84.12 (Regulation of the activities of providing healthcare, education, cultural services and other social services, excluding social security)) in EU27, Norway and Switzerland.</p> <p><i>Source: European Public Sector Innovation Scoreboard 2013 based on Innobarometer 2010</i></p>
Government procurement as driver of business innovation	<p>The indicator is constructed by calculating the share of “Yes” out of all responses to the following question: Since January 2009, did the public procurement activities of your company include the possibility to sell one of your innovations to the government (i.e. new or significantly improved products or services)? Answer categories: Yes / No / [DK/NA]</p> <p>Survey of 9500 randomly selected businesses employing 1 or more persons in the manufacturing (NACE.C), retail (NACE.G), services (NACE.I/J/K/H) and industry (NACE.B/D/E/F) in EU27, Croatia, Iceland, Former Yugoslav Republic of Macedonia, Norway, Switzerland and Turkey.</p> <p><i>Source: European Public Sector Innovation Scoreboard (2013) based on Innobarometer 2011</i></p>
Time required and cost to start-up a company	<p>Time required to start a business is the number of calendar days needed to complete the procedures to legally operate a business. If a procedure can be speeded up at additional cost, the fastest procedure, independent of cost, is chosen.</p> <p>Cost to register a business is normalized by presenting it as a percentage of gross national income (GNI) per capita.</p> <p><i>Source: World Bank Doing Business 2013</i></p>
Number of Hours to Comply Across the European Union	<p>Time is recorded in hours per year. The indicator measures the time taken to prepare, file and pay three major types of taxes and contributions: the corporate income tax, value added or sales tax, and labour taxes, including payroll taxes and social contributions.</p> <p><i>Source: European Commission based on the study PWC, Paying Taxes 2012, The Global Picture</i></p>

Financial obstacles of SMEs for receiving a bank loan across Euro area countries	<p>Every six months European Central Bank assess the latest developments of the financial conditions of firms in the euro area but conducting Survey on the access to finance of SMEs in the euro area (SAFE). The survey covers micro, small, medium-sized and large firms and it provides evidence on the financing conditions faced by SMEs compared with those of large firms during the past six months. Information on financial obstacles of SMEs for receiving a bank loan across Euro Area is derived from SAFE in particular from the number of positive responses to questions:</p> <p>Q7A. Application to external finance in the past 6 months – euro area</p> <ul style="list-style-type: none"> <li>• Did not apply because of possible rejection</li> </ul> <p>Q7B. Application success in the past 6 months – euro area</p> <ul style="list-style-type: none"> <li>• Applied but refused because cost too high</li> <li>• Applied but was rejected</li> <li>• Applied but got limited part of it</li> </ul> <p>Source: ECB</p>
Interest rates for one-year loans up to EUR 1 million	<p>Annualized agreed rate/narrowly defined effective rate for the amount up to EUR 1 million issued to counterpart sector of non-financial corporations on loans other than revolving loans and overdrafts, convenience and extended credit card debt maturing up to 1 year.</p> <p>Source: ECB</p>
Legal and regulatory framework	<p>Average evaluation (0 = negative; 10 = positive) of the statement ‘<i>The legal and regulatory framework encourages the competitiveness of enterprises</i>’ in an IMD survey of businesspeople.</p> <p>Source: IMD (International Institute for Management Development)</p>
Burden of government regulation	<p>Average mark given by business executives in a World Economic Forum survey to the question ‘<i>How burdensome is it for businesses in your country to comply with governmental administrative requirements (e.g., permits, regulations, reporting)?</i>’ (1 = extremely burdensome; 7 = not burdensome at all)</p> <p>Source: Global Competitiveness Report 2013-14 of the World Economic Forum</p>
E-government usage by enterprises	<p>Share of enterprises using the internet to interact with public authorities (i.e. having used the Internet for one or more of the following activities: obtaining information, downloading forms, filling-in web-forms, full electronic case handling). Data are expressed in % of enterprises with 10 or more persons employed and belonging to the NACE 2.0 sections C, D, E, F, H, I, J, L, division 69-74 and group 95.1.</p> <p>Source: Eurostat, Survey on ICT usage and e-commerce in enterprises</p>
Tax compliance burden across the EU (number of hours to pay taxes)	<p>Number of hours a company operating in the same conditions would need to spend to comply with tax regulations in the Member States in 2013</p> <p>Source: World Bank Group “Paying Taxes 2013 The global picture”</p>
Number of hours it takes to prepare, file and pay three major types of taxes	<p>Time to prepare and pay taxes is the time, in hours per year, it takes to prepare, file, and pay (or withhold) three major types of taxes: the corporate income tax, the value added or sales tax, and labor taxes, including payroll taxes and social security contributions.</p> <p>Source: World Bank Group “Paying Taxes 2013 The global picture”</p>

<b>Finance and Investment</b>	
Early stage financing	<p>The indicator measures early stage financing as % of GDP. Venture capital investment data are broken down into ‘early stage’ (seed and start-up) and ‘expansion and replacement’ capital. Seed capital is defined as financing provided to research, assess and develop an initial concept before a business has reached the start-up phase. Start-up is defined as financing provided for product development and initial marketing, manufacturing and sales.</p> <p><i>Source: Eurostat, using data from the European Private Equity and Venture Capital Association (EVCA).</i></p>
Time taken for payments by public authorities	<p>Effective payment duration in days.</p> <p><i>Source: European payment Index by Intrum Justitia</i></p>
Loans to non-financial corporations in the euro are (EUR 1 billion, last three months)	<p>Cumulative annual flows of bank loans to non-financial institutions from March<sub>(t)</sub> to February<sub>(t+2)</sub> as % of outstanding volumes at March<sub>(t)</sub>.</p> <p><i>Source: ECB – Monetary financial Institutions Balance Sheet Items Statistics</i></p>
The top 10 European countries for FDI	<p>Based on Ernst &amp; Young’s European Investment Monitor, the database tracks FDI projects that have resulted in new facilities and the creation of new jobs. An investment in a company is normally included if the foreign investor has more than 10% of its equity and a voice in its management. FDI includes equity capital, reinvested earnings and intra-company loans.</p> <p><i>Source: Ernst &amp; Young’s 2012 European attractiveness survey</i></p>
<b>Skills and productivity</b>	
Skill and labour shortages in European manufacturing companies	<p>Skill and labour shortage in European manufacturing companies expressed as percentage excess of demand over supply of available workforce with distinction between skilled and low skilled and unskilled.</p> <p>Labour shortage indicator (LCI) shows proportion of manufacturing companies that consider labour shortages, regardless of skill level, being a factor so severe that it may limit their production.</p> <p><i>Source: Eurofund, “European Company Survey”</i></p> <p><i>European Commission “Business Survey”</i></p>
Proportion of workers in the manufacturing who feel under- or over-qualified for their current duties in 2005 and 2010	<p>Comparison across EU-27 and country by country of the percentage of workers employed in manufacturing who feel that they are under or over-qualified for their current duties.</p> <p><i>Source: Eurofund “Fifth European Working Conditions”</i></p>
Percentage of workforce who feel under qualified for their current duty	<p>Comparison across manufacturing subsectors of the percentage of workers employed who feel that they are under qualified for their current duties.</p> <p>Answer to the Question 60 of the survey: Which of the following alternatives would best describe your skills in your own work?</p> <ul style="list-style-type: none"> <li>1 - I need further training to cope well with my duties</li> <li>2 - My present skills correspond well with my duties</li> <li>3 - I have the skills to cope with more demanding duties</li> <li>8 - DK/no opinion (spontaneous)</li> <li>9 - Refusal (spontaneous)</li> </ul>

	<i>Source: Eurofund “Fifth European Working Conditions”</i>
Real unit labour cost	<p>Real unit labour cost is the ratio of compensation per employee to nominal GDP per person employed.</p> <p>Source: European Commission (AMECO)</p>
Changes in the annual growth rate of GDP compared to the share of gross fixed capital formation in total GDP	<p>Comparison of the annual growth rate of GDP with the share of gross fixed capital formation in the total GDP (ratio between GFCF and the total GDP). Observed data between 2010 and 2013 have also been compared with economic forecast by DG ECFIN (European Commission). GDP and GFCF have been measured at current prices, EUR in EU-27).</p> <p>Gross domestic product (GDP) is the sum of final uses of goods and services by resident institutional units (final consumption expenditure and gross capital formation), plus exports and minus imports of goods and services. At regional level the expenditure approach is not used in the EU, because there is no data on regional exports and imports.</p> <p>Gross fixed capital formation (GFCF) consists of resident producers’ investments, deducting disposals, in fixed assets during a given period. It also includes certain additions to the value of non-produced assets realized by producers or institutional units. Fixed assets are tangible or intangible assets produced as outputs from production processes that are used repeatedly, or continuously, for more than one year.</p> <p>Source: AMECO, ECFIN economic forecast</p>

## 5.1.1 TABLE: Comext eco-products codes and descriptions

OLD Comext code	NEW Comext code	Product description
84 10 11 00	84 10 11 00	Hydraulic turbines and water wheels, of a power ≤ 1.000 KW (excl. hydraulic power engines and motors of heading 8412)
84 10 12 00	84 10 12 00	Hydraulic turbines and water wheels, of a power > 1.000 KW but ≤ 10.000 KW (excl. hydraulic power engines and motors of heading 8412)
84 10 13 00	84 10 13 00	Hydraulic turbines and water wheels, of a power > 10.000 KW (excl. hydraulic power engines and motors of heading 8412)
84 10 90 90	84 10 90 00	Parts of hydraulic turbines and water wheels n.e.s.; hydraulic turbine regulators
84 13 70 21	84 13 70 21	Submersible pumps, single-stage
84 17 80 90	84 17 80 30	Ovens and furnaces for firing ceramic products
	84 17 80 50	Ovens and furnaces for firing cement, glass or chemical products
	84 17 80 70	Industrial or laboratory furnaces, incl. incinerators, non-electric (excl. for the roasting, melting or other heat treatment of ores, pyrites or metals, bakery ovens, ovens and furnaces for firing ceramic products, ovens and furnaces for firing cement, glass or chemical products, drying ovens and ovens for cracking operations)
84 17 80 10		
84 17 90 00	84 17 90 00	Parts of industrial or laboratory furnaces, non-electric, incl. incinerators, n.e.s.
84 19 11 00	84 19 11 00	Instantaneous gas water heaters (excl. boilers or water heaters for central heating)
84 19 19 00	84 19 19 00	Instantaneous or storage water heaters, non-electric (excl. instantaneous gas water heaters and boilers or water heaters for central heating)
84 21 29 90	84 21 29 00	Machinery and apparatus for filtering or purifying liquids (excl. such machinery and apparatus for water and other beverages, oil or petrol-filters for internal combustion engines and artificial kidneys)
84 21 39 30	84 21 39 20	Machinery and apparatus for filtering or purifying air (excl. isotope separators and intake air filters for internal combustion engines)
84 21 39 71	84 21 39 60	Machinery and apparatus for filtering or purifying gases (other than air), by a catalytic process (excl. isotope separators)
84 21 39 51	84 21 39 80	Machinery and apparatus for filtering and purifying gases (other than air and excl. those which operate using a catalytic process, and isotope separators)
84 21 39 55		
84 21 39 99		
84 21 99 00	84 21 99 00	Parts of machinery and apparatus for filtering or purifying liquids or gases, n.e.s.
85 41 40 00	85 41 40 10	Light emitting diodes
85 41 40 90	85 41 40 90	Photosensitive semiconductor devices, incl. photovoltaic cells
85 41 40 91		
90 26 80 91	90 26 80 20	Electronic instruments or apparatus for measuring or checking variables of liquids or gases, n.e.s.
90 26 80 99	90 26 80 80	Non-electronic instruments or apparatus for measuring or checking variables of liquids or gases, n.e.s.
90 27 10 10	90 27 10 10	Electronic gas or smoke analysis apparatus
90 27 10 90	90 27 10 90	Non-electronic gas or smoke analysis apparatus



### 5.1.2 The country codes used in the tables

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

## 5.2. Methodological note on clustering

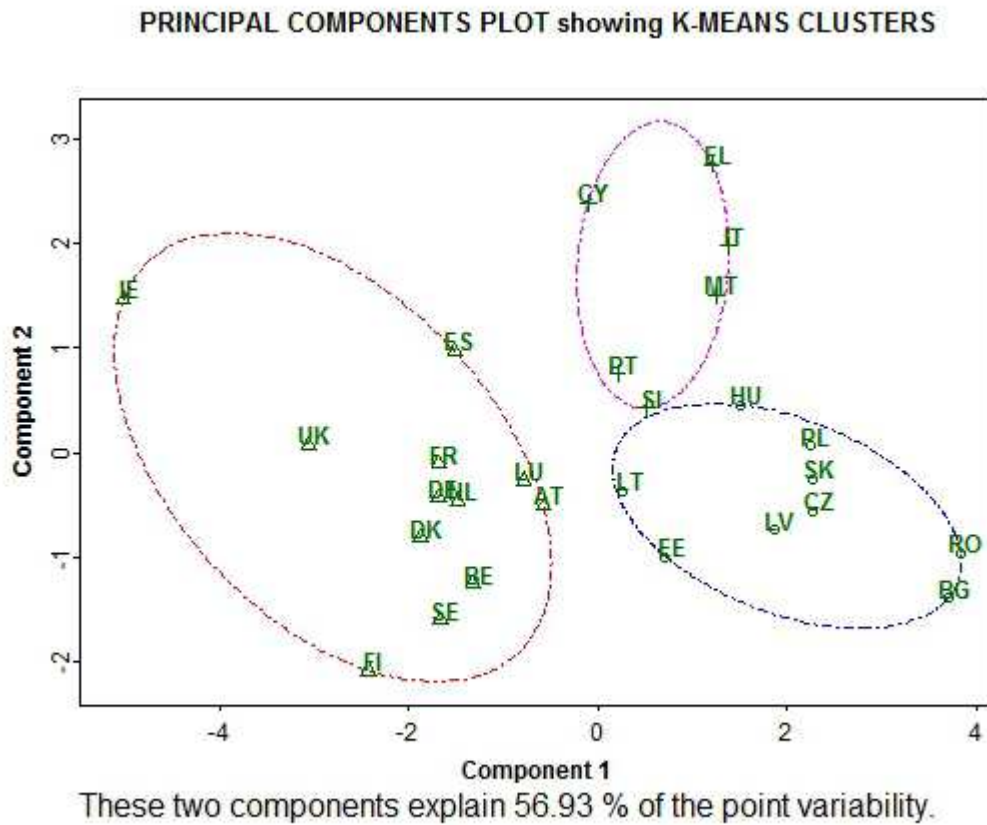
To facilitate the description and analysis of the competitiveness of the Member States, they are classified into performance groups. Their performance is defined by the ten indicators chosen for the scoreboard, with values that are the latest available in the first half of 2013. In order to obtain full datasets missing data have been estimated by an expectation maximisation algorithm.

The cluster analysis has been conducted on a full set of 10 indicators. Although some variables are correlated with each other and are likely to move together, in order not to lose any information contained in the dataset the analysis has been conducted on the full set of indicators. Prior to the analysis the dataset has been standardised.

To gauge the stability of the clustering, a series of different methods were initially used. Each method produced slight variations in the groupings, and the desired number of groups was an influential factor. As a representative example, the clustering in this report has been performed by using the ‘k means’ method that in this case suggests the optimal number of clusters to be three (using the error sum of squares criteria). The figure below depicts the clusters in the space of the first two principal components that are extracted from the dataset.

The first two components account for 56.93% of the variability. The third component (not shown) accounts for 11.46% of the variance explained. Adding the third variable would not change the location of the countries that are on the borders of their clusters. The first component seems not to be driven by any particular variable, although it seems to be most influenced by labour productivity, educational attainment, business environment, infrastructure satisfaction and innovation. Components two and three seem to be influenced by electricity prices and bank lending.

In the case of Croatia, data problems have this time excluded it from the clustering analysis, but for analytical purposes it has been included in the group of catching-up countries, as in many ways it shows similar behaviour.



Source:

Commission calculations.

### 5.3. Methodological note on the introductory graph in the country chapters

The graphs combining the data for each country are intended to show all the chosen competitiveness indicators in a comparable fashion, and in a way that it reflects the position of the country in relation to the EU average and the distribution of other Member States around that average. To observe or compare changes in individual indicators the bar graphs of sections one and three should be used.

The graphs present, for each indicator, the gap between the value of the respective Member State and the EU average. This gap is expressed in terms of standard deviations, which is a common measure of the spread of observations in a distribution (in this case, a measure of the variation of Member State performance around the EU average). This enhances the comparability of the presentation of indicators with different measurement units and distributions across Member States.

$$D_I(C) = \frac{I_C - I_{EU27}}{\sigma_I},$$

Where  $D_I(C)$  is the gap;  $I_C$  is the value of the indicator for each country  $C$ ;  $I_{EU27}$  is the average of the indicator for the EU27 and  $\sigma_I$  the standard deviation of the distribution of country values of the indicator:

$$\sigma_I^2 = \frac{1}{27} \sum_C (I_C - I_{EU27})^2.$$

The quantity  $\sigma_I$  measures the average distance of a Member State to the EU average for the indicator considered.

The data are presented in the country graphs in such a way that a bar pointing to the right always indicates a positive performance. Likewise, a bar pointing to the left always indicates a performance below average. This is straightforward for indicators, e.g. labour productivity, where high values are strived for. However, for those indicators where low values are the objective, the data bars in the graph have been converted so that a positive deviation from the average (bar pointing to the right) represents a *lower* value of the indicator than the average. These conversions enable an easy reading of the country profiles, since all bars presenting positive values in the country profile suggest a level of performance of the respective Member State which is better than the EU average and all bars presenting negative values suggest a level of performance of the respective Member State which is below EU average.

The indicators for which such conversions have been carried out are: (1) energy intensity in industry in kg of oil equivalent per euro of gross value-added at constant prices; (2) carbon intensity per ton of oil equivalent of energy consumption; (3) electricity prices for medium-sized enterprises, (4) time required to start a business; (5) time taken for payments by public authorities.

The indicators for which calculating a gap with the EU average would not be meaningful (exchange rates and trade balances) are quoted in the text. The EU averages used to show the respective standard deviations in the country profiles are the values for the EU as a whole and, hence, weighted averages of Member States performance. For the following indicators, however, unweighted arithmetic averages have been used due to missing EU totals: share of science and technology graduates, satisfaction with quality of infrastructure, legal and regulatory framework, time required to start a business, business environment score, enterprise survival rate, business churn, early stage financing, access to bank lending, duration of payments by public authorities, share of high-growth enterprises as percent of all enterprises.

Data used to show the respective standard deviations in the country profiles are the values for the EU as a whole and, hence, weighted averages of Member States performance where data are available. For the following indicators, however, unweighted arithmetic averages have been used due to missing EU totals: share of science and technology graduates, satisfaction with quality of infrastructure, legal and regulatory framework, time required to start a business, business environment score, enterprise survival rate, business churn, early stage financing, access to bank lending, duration of payments by public authorities, share of high-growth enterprises as percentage of all enterprises.