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Structural Change and the Competitiveness of EU Member States

Jürgen Janger, Werner Hölzl, Serguei Kaniovski, Johannes Kutsam, Michael Peneder, Andreas Reinstaller, Susanne Sieber, Isabel Stadler, Fabian Unterlass

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Abstract

Is structural change and economic specialisation associated with developments of competitiveness as defined by the ability to raise standards of living and employment, while maintaining sustainable external balances? To assess this relationship for the EU countries, we develop a set of indicators to monitor structural change and economic specialisation between and within sectors. We apply both descriptive statistics and econometric analysis to test whether this indicator set is linked to competitiveness. Our results lend support to the view that indicators of structural change, patterns of specialisation in both industry and trade as well as of sectoral upgrading can shed light on firm capabilities, prospects for growth and how to cope with adjustment pressure in the wake of rising competition. It provides a balanced picture of the competitive strengths and weaknesses of EU countries across both manufacturing and services.

Please refer to: Juergen.Janger@wifo.ac.at

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1030 Wien, Arsenal, Objekt 20 • Tel. (+43 1) 798 26 01-0 • Fax (+43 1) 798 93 86 • http://www.wifo.ac.at/ • Verlags- und Herstellungsort: Wien

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Structural Change and the Competitiveness of EU Member States

Final Report – CR 2011

JÜRGEN JANGER (COORDINATION), WERNER HÖLZL, SERGUEI KANIOVSKI, JOHANNES KUTSAM, MICHAEL PENEDER, ANDREAS REINSTALLER, SUSANNE SIEBER, ISABEL STADLER, FABIAN UNTERLASS

Research Assistance: Dagmar Guttmann, Kathrin Hranyai, Irene Langer, Elisabeth Neppl, Eva Sokoll

Scientific Advisors: Heinz Hollenstein, Marzenna Weresa

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CONTENT

1. EXECUTIVE SUMMARY

- We develop a set of indicators to monitor structural change between and within sectors and to monitor their corresponding specialisation patterns with the objective of assessing the competitiveness of EU Member States. We define competitiveness as the ability to raise standards of living and employment, while maintaining a sustainable environment and sustainable external balances. The analysis in this report is directly relevant for the ability to raise standards of living and employment, and indirectly for the sustainability of external balances, while environmental sustainability plays a minor role.
- The set of indicators demonstrates that indicators of structural change, patterns of specialisation in both industry and trade specialisation as well as of sectoral upgrading can shed light on firm capabilities, prospects for growth and how to cope with adjustment pressure in the wake of rising competition. It provides a balanced picture of the competitive strengths and weaknesses of EU Member States across both manufacturing and services. The industrial classifications selected complement each other well, and thus their joint use allows a fair assessment of countries.
- The indicators we found to be most useful or interesting for manufacturing only, at the detailed 3-digit NACE-classification level, are the following:
    - Relative Value Added (RVA) of technology driven and of labour-intensive&low-skill industries
    - Share of exports in high price and low price segments of technology-driven and labour-intensive industries
    - Share of exports to BRIC countries by industry type (technology-driven)
- The indicators we found to be most useful or interesting for manufacturing and services combined, at the broad 2-digit NACE-classification level, are the following:
    - Revealed Comparative Advantage (RCA) of sectors characterised by either high or low innovation and education intensity
    - R&D decomposition indicators, i.e. indicators which split the business enterprise R&D intensity of a country into an average effect and into a country-specific effect
    - Firm demography indicators such as the share of high growth firms or net entry of firms in highly innovative sectors
- We interpret our set of indicators to be informative about both the current and future competitiveness of EU member states, i.e. reflecting both current and future firm and country performance, while e.g. the Innovation Union Scoreboard's indicator set focuses more on potential future performance.
- Competitiveness can be sustained in different industries or sectors. There is not only one single recipe (industrial structure) that enables economies to grow and to create more and better jobs. However, in less knowledge-intensive industries, the task of maintaining competitiveness is more difficult. Specialisation in "traditional" structures requires either high product quality or high R&D intensity to sustain competitiveness. At the same time, trade specialisation in knowledge-intensive manufacturing industries should not be taken as a reflection of underlying firm capabilities without examining indicators such as product quality or R&D intensity to reveal in which part

of the value chain (R&D to assembly) countries specialise. The reverse holds true for value added specialisation in knowledge-intensive services sectors.

- Business cycles have a strong short-run impact on knowledge intensive industries and an even stronger impact on industries characterised by a low educational intensity. They also have a long-run persistent effect on performance, which is however smaller. This effect is more accentuated in sectors with higher technology intensity than in other sectors. Our findings therefore support arguments in favour of supporting these sectors during sharp economic downturns.
- Based on a limited set of indicators available until the end of 2010, the economic crisis of the years 2008 and 2009 seems to have had only a limited impact on structural change and patters of specialisation. Of course, for some countries intentional, policy-driven structural change will be a major pathway out of the difficult economic situation the economic crisis has brought upon them.

- The evolution of broad structural aggregates (agriculture, manufacturing, services) is very much in line with the level of economic development: EU countries with lower levels of GDP per capita feature also higher shares in agriculture and manufacturing than EU countries with higher per capita income.
- During the time under consideration, the EU taken as a whole expanded its world market share, while the US and Japan saw declines and China saw a massive rise in world market shares. This may to some extent reflect the globalisation of the value chain. Within the EU, the export share of capital intensive industries is increasing at the fastest rate. The share of labour-intensive industries in exports is declining, but not in domestic production as measured by value added.
- Technology-driven industries feature much higher shares in exports to fast growing emerging economies than industries characterised by low innovative activity; overall, the export intensity of technology-driven industries - the relationship between the export share and the value added share - is much higher than the one of labour-intensive industries.

- Forming country groups that share similar characteristics of structural change and specialisation patterns considerably helps to structure and interpret the information gained. Based on a statistical analysis we have identified the following four groups:
    - Group 1: Countries with high levels of GDP per capita, featuring specialisation in knowledge-intensive sectors and/or above average country specific R&D intensity, and above average export product quality, including Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Netherlands, Sweden, United Kingdom
    - Group 2: Countries with high levels of GDP per capita, featuring specialisation in labour-intensive sectors, and/or average country specific R&D intensity and product quality, including Cyprus, Greece, Italy, Luxembourg, Portugal, Spain
    - Group 3: Countries with moderate levels of GDP per capita, featuring trade specialisation in knowledge-intensive sectors and/or below average R&D effect and product quality, including Czech Republic, Hungary, Malta, Poland, Slovakia, Slovenia

    - Group 4: Countries with moderate levels of GDP per capita, featuring specialisation in labour-intensive sectors and/or below average R&D effect and product quality, including Bulgaria, Estonia, Latvia, Lithuania, Romania.
- Country groups 1 and 3 both show trade specialisation in knowledge-intensive industries, and usually group 3 is similar to group 1 when examining other structure indicators. Group 2 is similar to group 4, showing specialisation in labour-intensive industries and sectors characterised by low innovation intensity.
- In terms of change, group 1 specialises further in technology-driven industries and highly innovative sectors, while group 2 gains relative shares in sectors featuring high educational intensity. Group 3 and 4 show massive drops in trade specialisation in labour-intensive industries and similarly strong but opposed trends in trade and industry specialisation in technology-driven industries. Overall, the change profiles of group 1 and 3 are similar in direction (but not extent), as are those for group 2 and 4.
- Based on several indicators of structural change and specialisation, Groups 3 and 4 are catching-up with group 1 – with the exception of R&D - while group 2 is on average falling further behind group 1.
- The top EU countries are usually faring better across a range of indicators than the best extra-EU countries (e.g. Japan, Switzerland, US, Korea), the latter are however usually doing better than the EU average and slightly better than group 1.
- Finally, the specific industries and sectors selected in each country according to their relative value added and their RCA (highest RVA and RCA, top-winning and –losing RVA and RCA) bring the indicators to life. They hold the key to valuable information about a country's competitive strengths and weaknesses, its dynamic specialisation patterns and its ability to defend its strongholds.
- In terms of policy analysis, a word of caution is necessary: while analysis of structural change can be very powerful in assessing the competitiveness of countries, it should not be used directly for policy recommendations. It is a very good starting point, but more analysis is necessary to identify the policy levers available to contribute to structural change or to sectoral upgrading. Moreover, sectoral policy interventions will usually not be the main outcome of the exercise, as structural change can rarely be administered like a funding programme; rather it needs a broad mix of policies, including reforms of framework conditions such as product market regulation, innovation finance, education and training etc.
- In terms of very broad policy statements, country groups 2 and 4 could benefit both from structural change and sectoral upgrading (or structural change between and within), country group 3 mainly from sectoral upgrading and country group 1 can be split in countries which could focus either on structural change or on sectoral upgrading.
- Some individual indicators can be used to shape policy: e.g., from the R&D decomposition the focus of research policy becomes apparent – is low R&D intensity a problem of structure or of intensity? This leads to very different sets of policies, one focusing on supporting the rise in R&D intensity, the other one addressing structural change more broadly. The shares of exports to BRIC may be used by export promotion agencies to provide information to SMEs.

2. INTRODUCTION

The EU2020 strategy is an ambitious reform agenda, aiming at improving Europe's growth performance while fostering social inclusion and environmental sustainability. The ambitions reflect the grand challenges lying ahead of Europe, be they, among others, maintaining Europe's economic performance in the face of globalization or effectively acting against climate change. As an element of improved economic co-ordination between the EU Member States and sharing of best practice models, the successor to the Lisbon Strategy puts increased emphasis on the reform packages of EU Member States by setting national goals in various areas and by stepping up efforts to monitor Member States' performance. Economic performance ultimately hinges on the competitive performance of firms and industries. As a consequence, monitoring economic aggregates on their own may fail to provide the necessary information to guide enterprise and industrial policies such as the EU's flagship initiative "An industrial policy for the globalisation era". One of its key actions is that the Commission reports on changes in Europe's and Member State's competitiveness, industrial policies and performances on an annual basis. This is based on article 173 of the Lisbon Treaty, which stipulates that "The Union and the Member States shall ensure that the conditions necessary for the competitiveness of the Union's industry exist."… "the Member States shall consult each other in liaison with the Commission and, where necessary, shall coordinate their action. The Commission may take any useful initiative to promote such coordination, in particular initiatives aiming at the establishment of guidelines and indicators, the organisation of exchange of best practice, and the preparation of the necessary elements for periodic monitoring and evaluation."

The explicit call to provide for the preparation of necessary elements for to monitoring competitiveness provides a strong impetus to analyse the links between competitiveness and structural change and to distil a set of indicators suitable for the monitoring ofto monitor Member States' structural change.

The objectives of this study are threefold:

- To provide an up to date review of the link between structural change and competitiveness
- To identify indicators of structural change potentially suitable for the monitoring of structural change at the level of the EU and the Member States, building on existing work by WIFO
- Using these indicators, to provide data illustrating trends in structural change for the EU and its Member States

We start with a survey of the available literature in chapter 3. In chapter 4, we describe our criteria for choosing indicators and databases and present the broad set of indicators. In chapter 5, we apply these indicators to the EU as a whole, its Member States and where available some typical non-EU benchmark countries. Chapter 6 carries the analysis from chapter 5 one step further by investigating the links between structural change and competitiveness econometrically. While in chapter 6 we try to eliminate the effect of the business cycle on the relationship between structural change and competitiveness, we focus on precisely this effect of the business cycle on sectoral performance in chapter 7. In chapter 8, we test a new taxonomy to complement our existing ones. Chapter 9 concludes on the suitability of the indicators for policy analysis.

3. STRUCTURAL CHANGE, INDUSTRIAL SPECIALISATION AND COMPETITIVENESS: A BRIEF SURVEY

What do international comparisons of industrial structure and structural change reveal about the underlying competitive strengths and weaknesses of European countries?

We first define the terms competitiveness and structural change. For the purpose of this study, we define competitiveness as relating to the ability of an economy to increase growth, job creation and productivity in a sustainable way while the goods and services produced meet the test of international markets. This definition is broadly speaking adopted by the Competitiveness Reports of the European Commission (see, e.g., European Commission, 1998) and by the literature on competitiveness (see, e.g. Boltho, 1996, and Aiginger, 1998). We cannot contribute to the analysis of competitiveness in all its meanings; in particular the environmental sustainability issue plays a minor role.

By structural change, we understand the change in the production shares of sectors at varying levels of disaggregation. In turn this change gives rise to a particular industrial structure or sectoral composition in the economies under review at any given point in time. The concept of structural change was always closely associated with economic development, since even today developing economies move from a high share of agricultural production to manufacturing and ultimately services, illustrating both the impact of differential technological progress and hence productivity growth as well as varying sectoral income elasticities (for recent surveys, see Krüger, 2008; Silva and Teixeira, 2008).

We will not limit ourselves to just the three aforementioned sectors but use much finer sectoral disaggregations for both manufacturing and services. Moreover, we will refer to structural change between sectors as being the shifting of production shares between sectors and to structural change within sectors as being the shifting of production shares of firms within sectors, indicating either firm entry and exit from a sector or differential firm expansion.

What can structural change between and within sectors, which in turn gives rise to specific industrial structures, tell us about developments in the competitive performance of countries as defined above?

3.1. Industrial structure as an indicator of firm capabilities

First, while they are not the only drivers of structural change and hence determinants of industrial structure, technological development and innovative ability are important in this regard, as argued both empirically and theoretically (see Dosi and Nelson, 2010, for an account from on evolutionary perspective, and Ngai and Pissarides, 2007, for a multisector endogenous growth model). Larger technological opportunities and faster learning can accelerate the process of structural change and lead to an earlier emergence of new industries (Krüger, 2008); "the processes of knowledge accumulation and diffusion involve winners and losers, changing distributions of competitive abilities across different firms, and, with that, changing industrial structures (Dosi and Nelson, 2010, p. 53).

More broadly, even though there is considerable firm heterogeneity within sectors, firms usually need certain competencies or production factors to be able to produce a particular good and/or service. In turn it is these very goods/services that define to which sector a firm statistically belongs. Put differently, the requirements for firm competitiveness differ to a certain extent by sector. E.g., specialisations of a country in sectors that are usually characterised by high innovative activity indicate that firms in this country are capable of engaging in innovative activity.

The use of aggregated industrial classifications based on outputs implies that we study industry groupings which are collections of many markets. However, if technology, market

environments as well as competitive behaviour are much more similar within than between the industry groupings then it should be clear that grouping based on outputs does provide important information on the underlying dynamics of structural change. The factors determining specialisation patterns are tangible and intangible resources. In modern economies these are not primarily linked to natural resources but to the knowledge base of an economy and the quality of a differentiated labour force.

As a consequence linking sectoral composition to competitiveness developments requires sectoral classifications which aim to identify crucial production factors, or other factors which could provide information about the competitive environment of a sector such as the range of options available to firms to create competitive advantages. Such sectoral classifications will be described below when the set of indicators is presented.

Domestic industrial and trade specialisation are linked in open economies, as growth in output and the creation of jobs requires industries to be competitive on an international scale. Otherwise, imports would increase, thereby dampening the prospects for job creation in domestic firms. While traditional trade theory explains trade specialisation as resulting from differences in factor endowments by countries, the technology gap model points towards technology gaps as the main source of trade flows. Contrary to the Solow-Swan growth model, in which technology is perceived as a public good, the technology gap model maintains that technology does not hold all the public good characteristics because it is partly appropriable and set in organisations and firms (Fagerberg, 1994, Fagerberg et al., 1994). Thus, imitating a new technology takes time. This mirrors the role of differential technological capabilities for domestic industrial evolution and implies that in particular for large countries, industrial specialisation should actually be close to trade specialisation, while in small countries due to their small market size there may be firms exporting very high shares of their total production.

Trade structure differences between countries will also increase with differences in their income level. In their model of horizontal differentiation, Helpman and Krugman (1985) explain that the more dissimilar the country's demand and per capita incomes are, the less important horizontal intra-industry trade will be. Countries with similar income levels will specialise in different varieties of the same product, gaining from economies of scale.

3.2. Industrial structure as an indicator for differential overall growth prospects

Second, the sectoral composition as a result of structural change may be associated with competitiveness as industries differ in their contribution to overall economic performance (cf. Peneder, 2003). Industrial structures are presumed to be beneficial to economic performance the more they

- support the accumulation of knowledge and create positive externalities,
- correspond to the distribution of comparative advantage and dynamic economies of scale, and
- allow for product differentiation.

Applying dynamic macro-panel estimations, Peneder (2003) obtained the result that certain types of industries (like technology-driven and high skill intensive industries) systematically achieve higher rates of productivity growth and expansion of aggregate output than others. Fagerberg (2000, p. 1) finds that "countries that have managed to increase their presence in the technologically most progressive industry of [the period under review] (electronics) have experienced higher productivity growth than other countries".

Some academics have focused their empirical work on the relationship between trade structure and growth. In order to prove that trade structure 'matters for growth', Amable (2000) finds that countries with a higher degree of specialisation at the inter-industry level

have enjoyed faster productivity growth than less specialised countries. Bensidoun, Gaulier and Unal-Kesenci (2001) find strong evidence that specialisation in products facing a dynamic international demand has a positive effect on growth, because increased competition results in efficiency improvements. Linking product quality to a country's trade pattern, Hausman et al. (2007) conclude that an economy is better off when it produces goods that it can export to richer countries. If countries that are stuck with lower-income goods are able to overcome this problem (through policies), i.e. change their trade structure, they will exhibit higher economic growth. [1]

In conclusion, the empirical evidence suggests that structural change towards specific industries can be conducive to aggregate growth. Again, sectoral classifications are needed that capture these issues. Overall, the sectoral composition of an economy can provide clues about the underlying competitiveness of its firms, the potential for economy-wide growth triggered by knowledge spillovers, the ability to reap growth opportunities in emerging industries and the flexibility of an economy to shift productive resources to new uses, often implying new combinations of productive factors, hence requiring some form of innovation.

3.3. Structural change within sectors as an indicator of competitive developments

Structural change between sectors leading to industrial specialisation indicative of firm capabilities is only one component of the link between structural change and competitiveness. Structural change at the firm level may not shift sectoral shares, but nevertheless structurally change a sector if firms structurally upgrade their capabilities by absorbing or developing new technologies or production routines, or if new, more innovative firms enter a sector. Looking only at sectoral shares may hide the underlying dynamics of firm capabilities, in particular, when countries differ in their level of development. The increasing geographical dislocation of supply chains means that countries far from the technological frontier can show high shares in technology-driven industries, when firms from countries close to the technological frontier have established assembly plants in the countries far from the frontier.

Moreover, firm level heterogeneity in each sector means that innovative firms can be found in all sectors, and countries may feature a high share of innovative firms in a sector whose world- or European-wide distribution displays a low share of innovative firms (see (Peneder, 2010). Hence advanced countries may feature high economic performance even though they are specialised in "traditional industries" (cf. Peneder, 1999).

Therefore, any monitoring of industrial structure has to pay close attention to structural upgrading within sectors. One way to examine structural change within sectors in the absence of a full sample of firm-level data is to investigate the development of export quality.

Grossman and Helpman (1991, 1994) were the first to integrate theories of endogenous growth (where technological change is no longer exogenous, but explained within the model) into trade theory. They developed a two-country model of endogenous innovation and imitation, where the 'North' creates the next generation of technology intensive products by means of R & D investments, and southern entrepreneurs invest in learning the production process developed in the 'North'. In this model, the authors maintain that every product exists on a quality ladder, and that technologies below the current 'state-of-the-art' may have already become obsolete while others above it have yet to be discovered. One important assumption of their model is that, once the 'South' is able to imitate the new technology, the entire production of this good moves to the 'South'. As a result, northern profit maximising

[1] Saviotti and Pyka (2004) emphasize the role of new industries in structural change and economic development. However, quantifying this driving force of structural change in an appropriate way is not possible using industry classifications

firms are forced to innovate and bring out the next generation of high-technology products in order to escape low cost competition from the 'South', setting in motion a perpetual innovation process. Within the framework of this model, firms are continually racing to bring out the next generation of products, but the actual success of innovations may vary across industries and over time. Aiginger (2000) argues that a position on the higher rungs of the quality ladder is a necessary precondition for high cost producers (for example, Western Europe) to remain competitive in the international marketplace.

The empirical literature on the quality of exports has shown that such phenomena have indeed been widespread as advanced countries try to cope with the adjustment pressure from rising emerging economies. Focusing on trade between China and developed countries, Schott (2008) finds that they overlap in terms of export mix, but that over time this overlap gets less in terms of export prices, suggesting that developed (high-wage) countries compete with developing (low-wage) countries by raising their exports´ quality.

Studying the impact of Chinese import competition on twelve European countries, Bloom et al. (2011) show that two effects are at work. Within firms an increase in R&D, patenting, IT and total factor productivity can be observed. Between firms Chinese import competition drives reallocation of employment towards more innovative and technology advanced firms. Martin and Méjean (2011) examine the impact of low-wage countries´ competition on the quality of high-wage countries' exports using French firm-level data. They find that one fifth of the increasing specialization of France in high quality goods can be attributed to the competition with low-wage countries, limiting the market share loss of France in international trade.

Khandelwal (2010) uses US product-level import data to show that developed countries can insulate themselves in long-ladder markets from the 'South' by drawing on their comparative advantage in production factors such as skills, capital or technology and specialize at the top of the quality ladder. However, countries in short-ladder markets are directly exposed to the competition with the 'South' as quality upgrading is infeasible.

In conclusion, the perspective of structural change within sectors helps us to interpret the meaning of "between"-change indicators. It is a necessary supplement to tracking a country's industrial structure over time. In the words of Silva and Teixeira (2008, p. 291): "Structural change analysis comes to the fore as a powerful analytical tool that is capable of establishing links between changes at the level of microstructures and higher-level changes, while providing, at the same time, a more realistic account of the process of technology adoption and its effects on the economy, by emphasizing the sequential and path-dependent nature of economic change."

4. MONITORING STRUCTURAL CHANGE AND INDUSTRIAL SPECIALISATION: SUGGESTING A SET OF INDICATORS

4.1. Indicator and database selection criteria

According to our survey of the links, we suggest indicators to monitor structural change between and within sectors suitable to be associated with underlying developments in competitiveness. The overall objective for the indicators is to capture

- Structural change "between" sectors:
  - Direction of change, sectoral composition as an indicator for firm capabilities
  - Direction of change, sectoral composition as an indicator for potential of economy-wide growth
  - Ability to move into growth areas (reaping growth opportunities) or broad "niches" (smart specialisation)
- Structural change "within" sectors:
  - Upgrading of sectors in the face of adjustment pressure
  - Ability to defend "strongholds" (persistent specialisation)

Further critical issues are:

- Data Availability:
  - Country coverage: as the purpose of the present report is a monitoring of all the EU Member States, data sources with wide country coverage will be prioritized.
  - Regular update of databases: the report was constructed with a view to a yearly monitoring against the background of Europe 2020, hence databases were prioritized which are likely to be maintained over the next ten years.
  - Level of aggregation: the higher the level of disaggregation, the more sectoral statistics matches proper, "real-world" markets. However, with the exception of foreign trade indicators, there is a substantial trade off with data availability – the higher the level of disaggregation, the more difficult it becomes to obtain internationally comparable data.
  - Timeliness: as structural change is usually slow in comparison with the movement of macro-economic aggregates, timeliness of data ranks below the criteria for database and indicator selection above; however, for this report timeliness is very important, as illustrating the impact of the crisis can provide valuable information.
- Balance between manufacturing and services: due to the high share of services in the EU's countries, it is imperative to appropriately reflect the structure of the services sector, in domestic as well as in trade indictors.
- Balance between input- and output-indicators: even though monitoring of structural change involves by definition output indicators such as production shares or export quality, input indicators can play a valuable role. Moreover, as we use sectoral classifications drawing on input criteria such educational intensity, we can combine input and output aspects in one indicator (see below).
- Balance between domestic economy & foreign trade indicators:

- Trade indicators are indicators which are very sensitive to changes in competitive position. Compared to domestic production, which is often distorted by local demand conditions, trade data provide timely signals of shifts in the balance of competitive strengths and weaknesses.
- Trade statistics are less blurred by national conventions and accounting systems, and are available at a disaggregated level.
- However, trade indicators mirror only part of a country's economic structure and are particularly prone to reach misleading conclusions concerning the match between indicators of sectoral composition and underlying firm capabilities, as a result of the internationalisation of the supply chain.

- Focus on country monitoring: according with the report's intended use for country monitoring within the EU2020 strategy, indicators will be prioritized which show a country's relative position to other countries, rather than a country's absolute value.

4.2. Industrial and sectoral taxonomies used for this report

As mentioned above, linking industrial structure to competitiveness requires sectoral classifications which go beyond the official NACE classification. The latter basically establishes industries and sectors based on what they produce, while we need information on how they produce, incorporating an input perspective into output indicators. Below, we briefly describe the taxonomies used for this report while full details including the lists of sectors are in the technical appendix. Throughout the report, "industries" refer to the NACE-3-digit level of disaggregation, while "sectors" refer to the NACE-2-digit level of disaggregation.[2]

4.2.1. Classification of manufacturing industries according to factor input combinations and strategic investment ("Factor-Input")

This classification groups individual industries according to their typical combinations of factor inputs, in order to reveal information about differences across industries with regard to the dominant modes of creating competitive advantage in specific marketplaces. In particular, the typology is directed towards distinction between (i) exogenously given competitive advantages based on factor endowments and (ii) endogenously created advantages based on strategic investment in intangible assets such as marketing and innovation.

The economic rationale for this typology is based upon the emphasis on irreversible investments or so called 'sunk costs' as a means of increasing differentiation and thereby moving away from pure cost competition. Sunk costs can either be exogenously determined by technology (involving investment in physical capital) or endogenously by the strategic decisions of firms to invest in intangible assets such as technological expertise or the creation of brands and goodwill. The purpose of irreversible investment for example in advertising and research is to raise perceived quality and thus enhance the consumer's willingness to pay for a particular product, thereby also reducing its substitutability.

The typology groups manufacturing industries at the 3-digit NACE-level in five industry types according to the traditional factor intensities of labour and capital and additionally takes into account the inputs spent on research and development as well as advertising. A residual fifth category, labelled mainstream, uses factor inputs in similar proportions to total manufacturing. The five types are thus

[2] However, we will contrast „industry specialisation" with „trade specialisation", the first referring to specialisation measured by domestic value added data, the second by exports data.

- Technology-driven industries (TD)
- Marketing-driven industries (MD)
- Mainstream manufacturing (MM)
- Capital-intensive Industries (CI)
- Labour-intensive Industries (LI)

For details and a full list of the industry classification, see the technical appendix as well as Peneder (2002).

4.2.2. Classification of manufacturing industries according to the employment of skilled labour ("skill")

This taxonomy is only used to provide further detail as regards the factor-input taxonomy, namely to split labour-intensive industries into low-skill labour-intensive industries and the remaining rest of the labour-intensive industries. It basically discriminates between industries according to their employment of skilled labour. Industry types are

- Low skill
- Medium-skill blue collar
- Medium-skill white collar
- High skill

For details and a full list of the industry classification, see the technical appendix as well as Peneder (2002).

4.2.3. Classification of manufacturing industries according to elasticity of exports with respect to quality ("revealed quality elasticity", "RQE")

This classification groups manufacturing industries at the 3-digit NACE-level according to the importance of quality competition. In homogeneous markets, consumers and firms buy the goods from the cheapest source; any firm which undercuts the price will boost demand for its products (demand is price elastic). On the contrary, in heterogeneous markets, goods are differentiated by locations and product characteristics. The heterogeneity may come from a variety of tastes or specific demand characteristics. If prices are important in an industry, countries with high prices should sell small quantities and those with low prices should sell large quantities. On the other hand, if countries charge high prices and are nevertheless able to sell large quantities, the product must have some specificity (design, service, reliability etc.) which creates a willingness to pay. In this classification, this simple idea is applied to the existing trade data and industries are split into three groups:

- High RQE, in which quality is revealed to play an important role
- Moderate RQE, with moderate quality elasticity
- Low RQE, in which price dominates

For details and a full list of the industry classification, see the technical appendix as well as Aiginger (2000).

4.2.4. Classification of sectors according to educational intensity ("EDU")

This classification groups manufacturing and services sectors at the NACE-2-digit-level by educational intensity in the following five groups:

- High educational intensity
- Medium-high educational intensity
- Medium educational intensity
- Medium-low educational intensity
- Low educational intensity

"The economic interpretation of education emphasizes its nature as a special input to production."... "The literature reveals at least three causal links, by which schooling relates to future earnings: first, through the acquisition of cognitive and social skills (human capital theory); second, by sorting high- and low-productivity personnel into appropriate jobs (signalling and screening); and third, by increasing a society's capacity for innovation and the diffusion of new ideas (knowledge spillovers). Taken together, the three mechanisms support the conclusion that educational attainment is a valid measure of the productive capabilities available in the human resource base of a firm, sector or country. The theoretical literature also provides various explanations for the sector specificity of educational intensity. Assuming that factor and product markets are perfectly competitive, the most straightforward explanation of variations in the demand for educated personnel are intrinsic differences in the technology of production, which determines the marginal product, and together with input prices the factor shares of distinct skill classes. For a given level of output, the respective ratio of wages to labour productivity is therefore the immediate criterion in selecting skill standards for heterogeneous types of labour. From the perspective of a human resource manager, the required skill standards therefore depend on the characteristics of the technology and labour markets, which correlate with sector-specific contexts." (Kegels et al., 2008, p. 21)

For details and a full list of the sector classification, see the technical appendix as well as Peneder (2007).

4.2.5. Classification of sectors according to innovation intensity (distribution of innovative firms) ("INNO")

This classification groups manufacturing and services sectors at the NACE-2-digit-level by innovation intensity in the following five groups:

- High innovation intensity
- Medium-high innovation intensity
- Medium innovation intensity
- Medium-low innovation intensity
- Low innovation intensity

Measures of R & D relate to the inputs to innovation. Due to the inherent uncertainties of research, R & D inputs do not necessarily correspond to innovation output. Most recently, firm level indicators have been available through the Community Innovation Surveys (CIS), which provide direct measures of innovation performance. Peneder (2010) developed a new set of sectoral classifications based on these micro-data. Taking account of the heterogeneous nature of innovation behaviour among individual firms the new taxonomies are derived from the distribution of distinct firm types within the sectors. The outcome is a set of integrated classifications, which focus on (i) the kind of entrepreneurship; (ii) technological opportunity; (iii) appropriability conditions; (iv) the cumulativeness of knowledge; and (v) a final characterisation in terms of the sectors' overall innovation intensity, which will be used for this report.

For details and a full list of the sector classification, see the technical appendix as well as (Peneder, 2010).

4.3. Country group selection

As the 27 EU Member States are quite heterogeneous, we group countries by similar characteristics in terms of industrial structure and structural change. This facilitates the interpretation of data and provides a basis for policy analysis. Our country groups are inspired by the paper by Reinstaller and Unterlass (2011), but we have refined country group membership according to the indicators presented below, meaning that our country groups are built on the basis of the calculated indicators.

Basically, in Reinstaller and Unterlass (2011) countries are classified by their direct and indirect R&D intensity, indirect referring to R&D embodied in intermediate inputs. Indirect R&D intensity is further split in domestic and foreign R&D components. Finally, GDP per capita is used as an additional criterion. This approach is informative for structural change and economic structure as technological capabilities – proxied by direct and indirect R&D intensity – are partly driving structural change, as outlined in our survey of the literature. Reinstaller and Unterlass (2011) establish five groups of countries, group 1 featuring high direct and indirect R&D intensity, group 2 average direct and indirect R&D intensity, group 3 technology users with technology intensive industries (i.e., high indirect foreign R&D intensity), group 4 higher income countries with below average direct and indirect R&D intensity and group 5 lower income countries with below average direct and indirect R&D intensity.

We reduce these groups to 4 groups, merging essentially the first 2 and broadening the classification criteria to reflect our choice of indicators. Our final groups are

- Group 1: Higher income countries with specialisation in knowledge-intensive sectors, including Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Netherlands, Sweden, United Kingdom.
- Group 2: Higher income countries with specialisation in less knowledge-intensive sectors, including Cyprus, Greece, Italy, Luxembourg, Portugal, Spain.
- Group 3: Lower income countries with trade specialisation in technologically-progressive sectors including Czech Republic, Hungary, Malta, Poland, Slovakia, Slovenia.
- Group 4: Lower income countries with specialisation in less knowledge-intensive sectors, including Bulgaria, Estonia, Latvia, Lithuania, Romania.

Group averages are weighted averages (weighting depends on the indicator and can be e.g. value added of manufacturing). To give an order of magnitude, in terms of GDP based on power purchasing parities in the year 2010, group 1 amounts to 62% of the EU 27 GDP, group 2 to 26%, group 3 to 9 and group 4 to 3%. This implies that group 1 will have a tendency to be close to the EU average.

4.4. Indicators

Here we briefly present the full set of indicators, indicating which competitiveness-relevant element of structural change they elucidate as well as some features of the data in a summary table (Table 1) at the end of this subchapter (databases used, country coverage, years available). Technical details are in the appendix. Most of the indicators show the countries relative to the EU average. The precise number of countries the EU average consists of is given in Table 1 and in the technical appendix.

4.4.1. Indicators for monitoring structural change between sectors ("inter-industry upgrading")

- Industrial Specialisation:
    - Value added shares of manufacturing industries and both manufacturing and services sectors relative to the EU average, by industry and sector type (RVA, relative value added): this indicator calculates the share of an industry or a sector in the total value added of a country relative to the share of the same industry or sector in the total of the EU.
    - For extra-EU comparison, absolute value added shares of sectors will be calculated as well by sector type (VA shares).

- Trade Specialisation:
    - Revealed comparative advantage (RCA) for manufacturing industries, by industry type: this indicator shows the market share of an industry relative to the market share of the country under review in total EU exports and may thus be called "normalised market share" – a market share in an industry above the average market share of the country in total EU exports indicates positive trade specialisation in that sector. The RCA by RQE-industry type defines quality competition as an intrinsic characteristic of an industry (not changing over time or across countries) and could also be called "indicator on inter industry quality upgrading".
    - Revealed comparative advantage for manufacturing and services sectors (RCA, MS), by sector type: great effort was devoted to constructing an RCA measure which shows specialisation in both manufacturing and services by sector type
    - World market share (WMS) of broad services sectors and of manufacturing industries, by industry type: for extra-EU comparison, simple market shares in world exports are calculated.
    - Share of exports of manufacturing industries to Brazil, Russia, India and China (BRIC), by industry type: the BRIC are a proxy for fast growing emerging countries; as a result, this indicator shows in addition to the described implications of trade specialisation for competitiveness growth opportunities resulting from demand.

Overall, this first subset of indicators shows whether economic structures change towards more knowledge-intense and more quality-elastic industries as an indicator for growth potential; and which growth opportunities arise from any externalities and firm capabilities indicated by industrial and trade specialisation. Of course some indicators such as the share of exports to the BRIC are also interesting at the aggregate level and hence will be reported along with performance by sector and industry type.

- Business demographics: We report three indicators of business demographics and dynamics:
    - Relative business fluctuation (RBF), by sector type, calculated as the sum of the birth and death rates of firms relative to the average of the EU 27.
    - Relative net entry (RNE), by sector type: the annual growth in the population of active firms relative to the EU 27.
    - Share of high growth firms (HGF), by sector type: the share of high growth firms in the population of firms is calculated based on employment and turnover, relative to the EU.

Business demography indicators are linked with structural change and specialisation patterns; reporting them by sector type provides additional information on the growth prospects of a country, e.g. if firms predominantly enter highly innovative sectors or rather sectors characterised by low innovative activity. But it needs to be taken into account that most firm births and firm exits take place on the competitive fringe (e.g. Santarelli and Vivarelli, 2007).

4.4.2. Indicators for monitoring structural change within sectors ("intra-industry upgrading")

- "Quality specialisation": A method is developed based on Aiginger (2000) and more recent papers (see technical appendix) to divide the exports of each industry in a high, medium and low quality segment.
    - The share of exports of manufacturing industries in the high price segment, by industry type.
    - The share of exports of manufacturing industries in the low price segment.

The share of exports by price segment is a proper indicator of firm capabilities; its change over time reflects efforts by firms to upgrade their products in the face of international competition, hence pointing to the ability of countries to cope with global trade adjustment pressure, not by shifting production to other sectors, but by climbing up the quality ladder within industries.[3] Of course, this will be easier in industries with a higher potential for product differentiation.

4.4.3. Indicators showing both within and between changes

- Structurally adjusted R&D intensity of the business sector: We split Business Enterprise R&D Intensity (BERD – R&D expenditure as a share of value added) into two components:
    - First, the expected R&D intensity of a country given its industrial structure and R&D intensities of sectors averaged across a set of benchmark countries – i.e. this "sector effect" shows the R&D intensity of a country if given its industrial structure all of its sectors feature average R&D intensities.
    - Second, a pure country effect reflecting the structurally adjusted R&D performance of the business sector, i.e. the gap between actual R&D intensity and the expected R&D intensity (the sector effect) – the country effect shows if countries manage to achieve higher R&D intensities than the typical sectoral average.
    - In addition, the change over time between two aggregate R&D intensities can be split into the effect of structural change – e.g., R&D intensity increases due to a shift to sectors which feature higher R&D intensities – and into the effect of sectoral R&D intensities, e.g. R&D intensity increases because more R&D is spent in given sectors.

  The sector effect is thus a typical "between" indicator, indicating sectoral composition of an economy, while the country effect is a typical "within" indicator, indicating how firms over time actually change their R&D behaviour, possibly as a reaction to technological opportunities, or to intensifying trade pressure. Considerable effort was devoted to compiling a country set as large as possible.

- Structurally adjusted energy intensity of the business sector: we split energy intensity into a sector effect and a country effect, exactly the same way as we do the R&D decomposition.
  The difficulty here is that monetary values have to put in relationship with physical quantities. To compare countries, sectoral value added has to be converted in comparable real quantities, which is a difficult exercise given the lack of appropriate sectoral power purchasing exchange rates. Any outcome of this indicator has to be interpreted with great care and considerable margins of error should be assumed.
- Relative Labour Productivity (RLP), by sector type
    - The indicator RLP growth calculates labour productivity growth in a sector relative to country productivity growth and compares it to the same relationship for the EU as a whole.
    - The indicator RLP level does the same for the level of labour productivity.

Labour productivity developments by sector type indicate both sectoral upgrading ("within" effect) and also point to growth prospects by any differential labour productivity between different sector types, e.g. high RLP growth in highly innovative sectors would point to success with innovation-based growth strategies. However, as with energy intensity, we face

[3] In principle, one should be able to find high correlations between quality indicators and productivity levels.

serious problems concerning the international comparability of sectoral value added; and, as we doubt that the EU KLEMS database will continue to be updated, we cannot calculate labour productivity in terms of valued added per hour worked but rather per employee. This leads us to interpret this indicator with great care. RLP level will only be reported in terms of the position of a country within a quintile; RLP growth will be shown to be positive, negative or neutral, indicating that labour productivity growth in a sector type is higher or lower than or approximately equal to the EU average.

4.4.4. Identifying selected sectors by RVA and RCA

To further gain knowledge on country strengths and weaknesses, the ability to defend strongholds and to move into growth areas, we depart from our taxonomy approach and select individual industries and sectors by various criteria:

- 3 sectors/5 industries with highest RVA/RCA in the most recent year of the time series
- 3 sectors/5 industries with top Winning and losing RVA/RCA
- For the first group, we will also show the RVA and RCA over time as well as their position in price segments.

In a dynamic perspective, economies of scale generate self-reinforcing feedback mechanisms, path dependency and - like a "river that digs its own bed deeper" - first mover advantages come into existence. Lead-time then enables fast moving firms to top the learning curve and reinforce the productivity advantage. Hence, we expect persistence or even reinforcing specialisation; decreasing specialisation in the "top" sectors and industries would point to competitive weaknesses. Of course, this is a very simple approach; it does however add to our knowledge about country economies and makes the monitoring exercise less abstract.

Table 1: Summary of indicators used to monitor structural change

Structural change between or within	Broad indicator area	Indicator	Level of disaggregation & taxonomy	Database	Country coverage	Time
Monitoring structural change between sectors	Industry specialisation	Relative value added Shares (RVA)	3-digit manufacturing industries, Factor-input & RQE	Eurostat SBS, Census Bureau Annual Survey of Manufactures	EU 27 excl. MT; US	1999-2007; 2008
		RVA	2-digit manufacturing and services sectors, INNO & EDU	Eurostat SBS	EU 27 excl. MT	1999-2007
		Value added shares (VA)	2-digit manufacturing and services sectors, INNO & EDU	EU KLEMS, OECD STAN	EU 27 excl. RO, BG (KLEMS), EU-21 (STAN); US, JP, KR, CH	1999-2007
	Trade specialisation	World export market Share (WMS)	2- and 3-digit manufacturing industries, Factor-input & RQE	UNO Comtrade, Eurostat Comext	EU 27-total, US, JP, BRIC	1999-2009
		WMS	11 broad services sectors	Eurostat BOP, IMF	EU 27-total, US, JP, BRIC	2004-2009
		Revealed comparative advantage (RCA)	2- and 3-digit manufacturing industries, Factor-input & RQE	Eurostat Comext	EU 27	1999-2010
		RCA	11 broad services sectors	Eurostat BOP	EU 27	2004-2009
		RCA	2-digit manufacturing and services sectors, INNO & EDU	Eurostat Comext, BOP	EU 27;excl. GR, IR, MT for INNO & EDU; FI for EDU	2004-2009
		Share of exports to BRIC	3-digit manufacturing industries, Factor-input & RQE	Eurostat Comext	EU 27	1999-2010
	Business demographics	Relative business fluctuation (RBF)	2-digit manufacturing and services sectors, INNO & EDU	Eurostat SBS	EU 27 excl. GR, MT, IR, PL, RO	2006-2007
		Relative net entry (RNE)	2-digit manufacturing and services sectors, INNO & EDU	Eurostat SBS	EU 27 excl. GR, MT, IR, PL, RO	2006-2007
		Share of high growth firms (HGF)	2-digit manufacturing and services sectors, INNO & EDU	Eurostat SBS	16 EU countries	2006-2007
Monitoring structural change within sectors	Quality of exports	Shares in high and low price segments	3-digit manufacturing industries, Factor-input & RQE	Eurostat Comext	EU 27	1999, 2007, 2009
Monitoring structural change within and between sectors	R&D intensity	Decomposition of R&D Intensity in sector and country effect	2-digit manufacturing and services sectors, INNO	OECD STAN, Eurostat BERD	EU 27 excl. LU, US, JP, KR, NO, TR, NZ, AU, CA	1998-2007
	Energy intensity	Decomposition of energy intensity in sector and country effect	9 manufacturing sectors	OECD STAN, Eurostat Energy balance sheets.	17 EU countries	2004-2007
	Labour productivity	Relative labour productivity growth (RLP Growth)	2-digit manufacturing and services sectors, INNO&EDU	EU KLEMS, OECD STAN	EU 27 excl. RO, BG (KLEMS), EU-21 (STAN); US, JP, KR, CH	1999-2007
		Relative labour productivity (RLP Level)	2-digit manufacturing and services sectors, INNO&EDU	EU KLEMS, OECD STAN	EU 27 excl. RO, BG (KLEMS), EU-21 (STAN); US, JP, KR, CH	1999-2007

5. ASSESSMENT OF STRUCTURAL CHANGE IN THE EUROPEAN UNION

In this chapter, we present a few selected figures by indicator, pointing out the main features which differentiate the EU from extra-EU countries, as well as the country groups from each other. Summary tables at the end of this chapter show the full information available by industry and sector type, including the individual countries. At the end of this chapter, a clear picture of the economic structure and trends in structural change across the European Union should emerge. As outlined above, the term "industries" refers to the NACE 3-digit level, while the term "sectors" refers to the NACE 2-digit level. Furthermore, we contrast "industry specialisation" – specialisation measured by domestic value added – with "trade specialisation", specialisation measured by exports.

5.1. Broad pattern of income levels, structural change and economic structure

First, we want to provide a broad picture of income levels and structural change. We show the economic structure of various countries over time and trends in world export market share by industry type. Figure 1 shows GDP per capita relative to the EU27 average for the individual EU 27 countries, a range of non-EU countries and the four country groups. The only EU country to be above the level of the US and Switzerland is Luxembourg. The four country groups display a clear hierarchy, with country group 1 top in terms of GDP per capita. This hierarchy is practically reversed for the growth rates of GDP per capita, with the exception of the growth rate country group 2 which is below the one of country group 1.

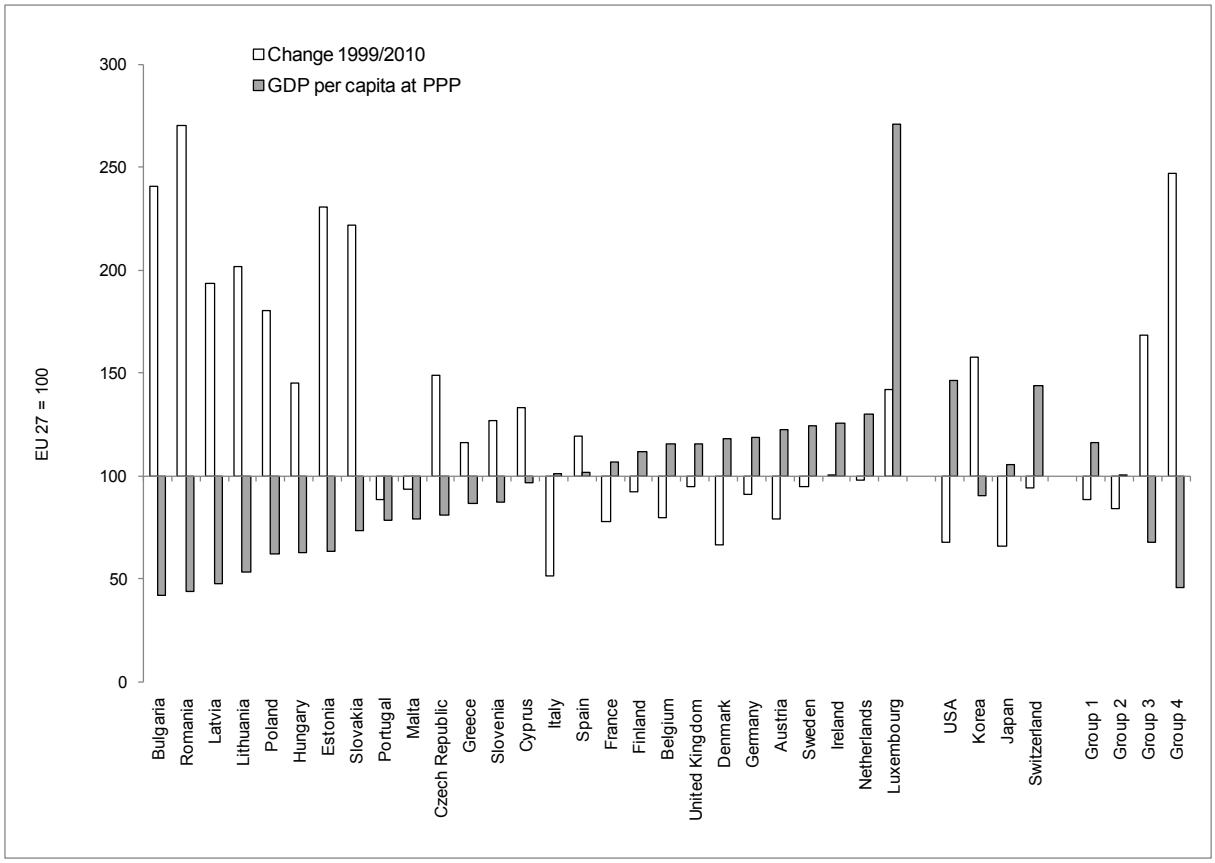
These income levels correlate closely with economic structure measured in broad aggregates, as described by early researchers of structural change (see above, literature survey) (Table 2). Shares of agriculture are lowest in group 1 and highest in group 4; shares of manufacturing are lower in the higher income countries (group 1 and 2) than in the lower income countries (group 3 and 4), while for services, both market and (other) public services, shares are the other way round, again consistent with longstanding accounts of structural change as economies develop. The same picture holds true when comparing the EU 27 with the US (agriculture 1.8 vs. 1.1%, manufacturing 17.2 vs. 13.7%, market services 49.5. vs. 52.1%, other (public) services 22 vs. 24.8%).

As the indicators below mainly focus on the distribution of production within the broad aggregates shown in Table 2, it is informative to investigate the shares of the broad aggregates in GDP, hence providing an order of magnitude to manufacturing and services. It is noteworthy that the manufacturing sector in Cyprus, Greece and Luxembourg is very small, at below 10%. Table 2 also points to the fact that structural change is considerable even over a relatively short time span of 8 years. In 1999, agriculture in Romania and Bulgaria was as big as or even bigger than manufacturing in the Netherlands and Denmark today (approx 15%). Within 8 years, agriculture's share dropped by approx. 7 percentage points. Irelands share of manufacturing dropped by 12 percentage points, the UK's by 6. Romania's and Bulgaria's share of manufacturing increased, consistent with theory, while Germany's and Austria's increase against economic prediction is probably due to their export success in the wake of increased price competitiveness and an advantageous structure of international demand for machinery and equipment.

The change between 2007 and 2010 sheds light on the impact of the crisis. Consistent with the usual sectoral swings caused by the business cycle, higher-volatility-manufacturing lost shares to public services, while market services were broadly stable. It is interesting to see that in Greece, Portugal, Ireland and Hungary manufacturing increased during the crisis. Most countries with a big construction sector before the crisis considerably reduced the share of this sector during the crisis (e.g., Ireland and the three Baltic States, but not Romania and Bulgaria). Jorgenson and Timmer (2011) conclude in their recent survey on structural change

that the classic separation in the three sectors agriculture, manufacturing and services has lost importance and that a new secular feature is the heterogeneity of the market services sector, where the distribution sector dynamically increases productivity whereas the other market services such as personal, finance and business services feature low productivity growth.

Figure 1: GDP per capita at PPP, relative to EU 27 and year-to-year percentage changes, 2010 against 1999



Source: Eurostat (AMECO).

Table 2: Value added share, 2007

	Agriculture			Manufacturing			Mining&Energy			Construction			Market Services			Other services		
Country	2007	Change 2007-1999	Change 2010*-2007	2007	Change 2007-1999	Change 2010*-2007	2007	Change 2007-1999	Change 2010*-2007	2007	Change 2007-1999	Change 2010*-2007	2007	Change 2007-1999	Change 2010*-2007	2007	Change 2007-1999	Change 2010*-2007
Austria	1.76	-0.36	-0.22	20.44	0.41	-1.26	2.72	-0.28	0.37	6.96	-0.87	-0.06	47.75	2.23	-0.41	20.37	-1.13	1.57
Belgium 1)	0.89	-0.41	-0.21	16.34	-2.92	-2.34	2.21	-0.65	0.11	5.24	0.22	0.15	52.26	3.32	-0.03	23.06	0.45	2.33
Bulgaria 2)	6.33	-9.97	0.96	18.51	1.62	-0.79	6.78	-0.16	-0.78	7.23	2.19	1.20	46.20	6.18	-0.89	14.95	0.15	0.30
Cyprus 1)	2.20	-1.79	0.10	7.48	-2.84	-0.56	2.46	0.30	-0.09	9.10	1.84	-0.81	55.86	1.27	-0.54	22.90	1.22	1.91
Czech Republic 1)	2.46	-1.39	-0.20	26.56	0.00	-3.01	5.47	0.22	1.32	6.42	-0.55	0.94	42.38	1.40	0.08	16.69	0.32	0.87
Denmark	1.18	-1.19	0.07	14.09	-2.45	-1.64	5.89	2.01	-0.55	5.66	0.04	-1.40	46.91	2.76	0.53	26.28	-1.17	2.98
Estonia	3.17	-1.26	0.30	16.73	0.00	0.02	3.97	-0.65	1.96	9.46	3.90	-3.77	50.53	-0.13	-1.49	16.13	-1.85	2.97
Finland	3.01	-0.47	-0.12	24.25	-1.35	-5.44	2.62	0.23	0.92	6.94	0.83	-0.32	41.88	0.88	2.01	21.30	-0.13	2.95
France 1)	2.22	-0.83	-0.47	12.53	-3.64	-1.87	1.79	-0.13	0.02	6.31	1.21	0.17	52.28	3.32	0.75	24.87	0.07	1.39
Germany	0.96	-0.27	-0.09	23.85	1.42	-3.15	2.65	0.22	0.40	4.03	-1.47	0.11	46.74	0.82	0.90	21.76	-0.72	1.84
Greece	3.47	-3.16	-0.21	9.27	-1.92	1.50	3.10	0.29	-0.03	6.56	-0.52	-2.50	54.46	3.42	-0.70	23.15	1.90	1.94
Hungary	3.97	-1.80	-0.48	22.20	-0.36	0.78	2.97	-1.15	0.79	4.61	0.06	-0.66	43.84	3.03	-0.10	22.41	0.23	-0.34
Ireland 1)	1.43	-2.18	-0.45	21.87	-12.51	2.34	2.13	0.71	-0.04	9.73	3.08	-4.12	46.16	8.37	-1.74	18.68	2.54	4.01
Italy	2.08	-0.97	-0.18	19.19	-2.10	-2.41	2.45	-0.24	0.12	6.16	1.19	-0.19	50.29	1.86	0.27	19.84	0.25	2.39
Latvia 1)	3.58	-0.36	-0.29	11.39	-2.64	-1.45	2.85	-1.45	1.23	9.01	2.59	-2.39	54.09	4.77	-0.03	19.07	-2.91	2.92
Lithuania 1)	3.94	-3.33	-0.58	18.61	0.77	-2.23	3.77	-0.94	0.41	10.24	2.66	-3.83	47.14	7.48	1.48	16.28	-6.64	4.75
Luxembourg	0.40	-0.41	-0.10	9.16	-2.33	-2.36	1.49	0.06	-0.22	5.59	-0.51	-0.68	68.39	4.50	2.10	14.97	-1.31	1.26
Malta	2.40	-0.29	-0.50	15.87	-4.28	-2.46	1.97	-0.30	0.94	3.99	0.17	-0.40	48.45	-1.45	-0.08	27.31	6.16	2.51
Netherlands	2.09	-0.59	-0.14	14.16	-1.55	-0.97	5.05	1.69	0.19	5.57	0.01	-0.27	50.06	-0.65	-1.84	23.07	1.08	3.02
Poland	4.35	-0.91	-2.82	19.02	-0.09	0.16	5.61	0.00	-2.52	7.18	-1.03	-0.28	45.78	1.55	1.57	18.06	0.47	3.89
Portugal	2.48	-1.54	1.05	14.69	-3.42	3.89	3.53	0.41	2.60	6.85	-0.51	0.10	48.88	4.08	-3.42	23.56	0.98	-4.23
Romania 2)	6.51	-7.87	0.93	23.61	1.95	-1.18	3.85	-2.43	-0.44	10.30	4.91	1.62	41.10	1.07	-1.10	14.64	2.37	0.17
Slovakia	4.06	-0.69	-0.21	23.84	-0.53	-3.23	6.37	1.04	-1.21	8.19	2.59	0.81	41.66	-1.94	1.70	15.88	-0.47	2.15
Slovenia	2.51	-0.85	-0.10	23.46	-2.27	-2.82	3.26	-0.02	0.33	7.89	0.73	-1.18	44.30	3.59	1.11	18.58	-1.18	2.66
Spain 1)	2.90	-1.62	-0.23	15.08	-3.87	-2.30	2.39	-0.24	0.29	11.96	4.02	-1.10	47.46	1.64	1.14	20.21	0.07	2.20
Sweden 1)	1.72	-0.56	0.06	19.64	-2.15	-4.11	3.27	0.54	0.65	5.33	1.01	-0.10	45.28	0.54	1.41	24.78	0.63	2.09
United Kingdom	0.69	-0.43	0.05	12.36	-6.03	-0.85	4.21	0.24	-0.04	6.45	1.30	-0.30	53.26	2.90	0.98	23.03	2.02	0.16
EU 27 1)	1.83	-0.66	-0.17	17.24	-2.44	-2.31	3.06	0.19	0.10	6.42	0.80	-0.08	49.48	2.05	0.73	21.97	0.08	1.72
USA 1)	1.13	-0.09	-0.09	13.74	-3.00	-1.04	3.20	0.77	0.01	4.99	0.10	-0.94	52.13	1.29	0.05	24.82	0.92	2.00
Korea 1)	2.88	-2.16	-0.28	27.28	0.12	0.46	2.42	-0.41	-0.37	7.43	-0.30	-0.49	39.81	-0.54	-0.36	20.18	3.28	1.05
Japan 2)	1.38	-0.40	0.05	20.57	-0.63	-1.13	2.00	-0.83	-0.18	5.93	-1.41	0.07	46.61	1.61	0.38	23.51	1.66	0.82
Switzerland 2)	1.21	-0.37	0.06	20.13	0.46	0.09	2.15	-0.77	-0.02	5.42	-0.05	0.02	52.12	0.95	-0.26	18.98	-0.22	0.11
Group 1	1.36	-0.53	-0.15	17.21	-2.35	-2.04	3.05	0.26	0.18	5.58	0.20	-0.12	49.81	2.07	0.60	22.98	0.36	1.54
Group 2	2.50	-1.41	-0.12	16.45	-2.83	-1.65	2.54	-0.15	0.33	8.37	1.97	-0.69	49.71	2.07	0.29	20.44	0.35	1.84
Group 3	3.82	-1.10	-1.63	21.49	-0.27	-0.80	5.16	-0.03	-1.06	6.77	-0.38	-0.04	44.45	1.48	1.03	18.31	0.30	2.50
Group 4	5.83	-6.95	0.66	20.91	1.35	-1.17	4.36	-1.67	-0.18	9.56	3.93	0.41	44.09	2.94	-0.73	15.25	0.40	1.02

Group 1: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Netherlands, Sweden, United Kingdom. - Group 2: Cyprus, Greece, Italy, Luxembourg, Portugal, Spain.- Group 3: Czech Republic, Hungary, Malta, Poland, Slovakia, Slovenia. - Group 4: Bulgaria, Estonia, Latvia, Lithuania, Romania. - * 2010 or latest available. - 1) 2009 against 2007. - 2) 2008 against 2007.

Source: Eurostat, OECD.

Turning to trade specialisation and structural change in trade specialisation, Figure 2 compares world market shares of the EU 27 (extra-EU exports only) with the exports of the US, Japan, China and the aggregate of Brazil, Russia and India (BRI), in both manufacturing and services.[4] Table 3 provides more detail and the change in percentage points with respect to 1999 and 2007, again allowing for some conclusions about the impact from the crisis in terms of trade structure.

At the level of total manufacturing, the EU 27 could even increase its market share by 2.5 percentage points to 22.1% between 1999 and 2009, while the US and Japan both massively lost market share, by 6.6 and 4.3 percentage points to 12.2 and 7.6%, respectively. China dramatically increased its share of manufacturing exports to almost 17% by 11.2 percentage points, while the other BRIC countries showed much slower growth. In terms of trade specialisation, the EU has gained more than 5 percentage points in its market share in exports by technology-driven industries, in which it is now specialised as opposed to 1999: like the US and Japan, the EU achieves a higher market share in technology-driven industries than in total. Only mainstream manufacturing industries feature an even higher market share, but the dynamics over the time period (1999-2009) investigated are much less pronounced. The second strongest growing industry type by market share are the capital-intensive industries, where the EU is not specialised but will be so soon when current trends continue. By contrast, the market share of labour-intensive industries is dropping quickly, along with the market share by marketing-driven industries.

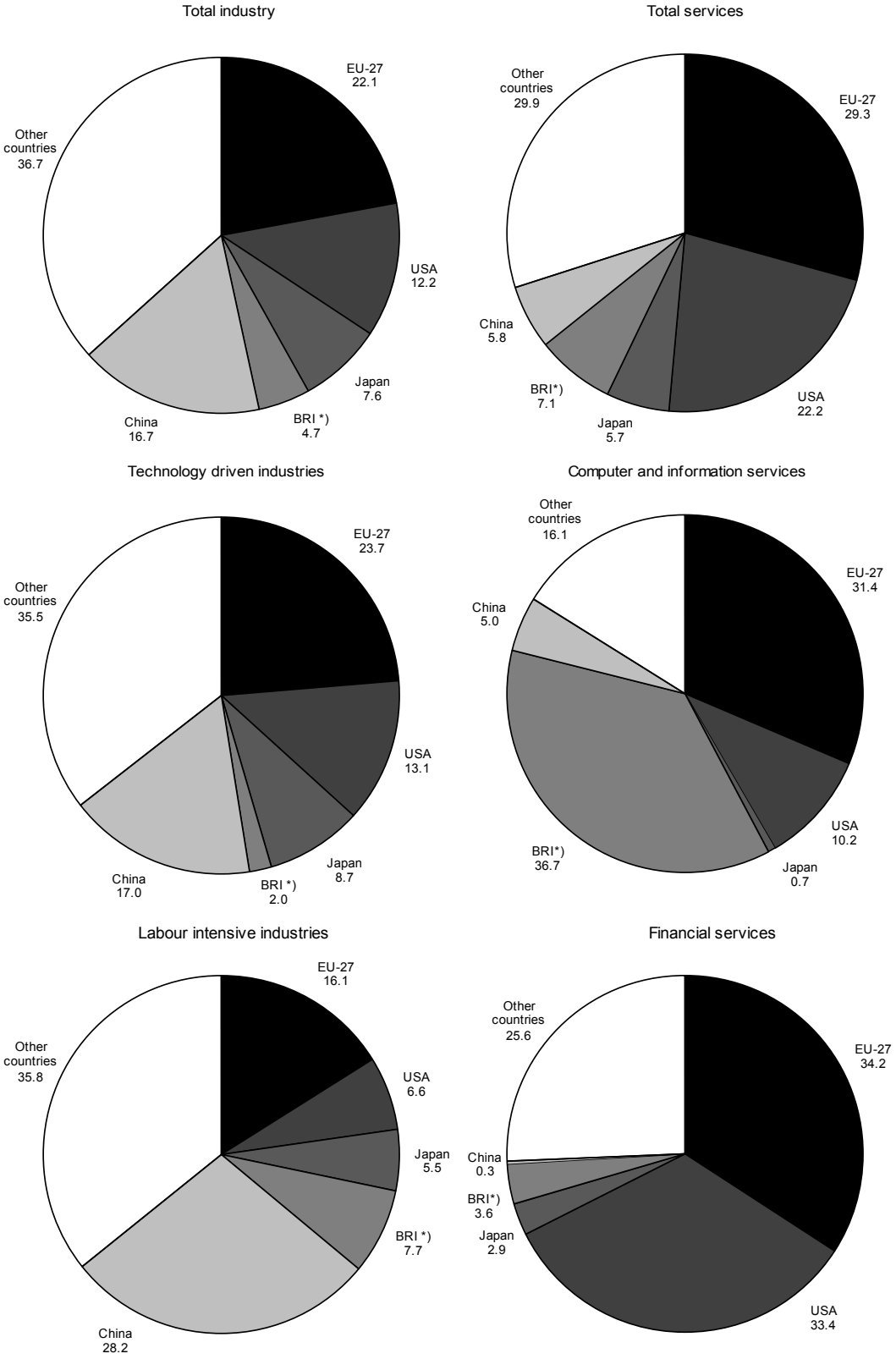
The crisis hit particularly labour-intensive and marketing-driven industries, while EU 27 technology-driven and capital intense industries gained export market shares between 2007 and 2009. In capital intense industries, wage costs play a minor role in comparison with labour-intensive industries which might explain their performance.

The match between, e.g. the world export market shares of the US and Japan and GDP per capita (Figure 1) is much less pronounced than in the case of value added indicators which should lead us to interpret links between trade structure and competitiveness - when defined as the ability to sustainably raise income levels – with care. It is likely that the complexities of global commerce where the design, manufacturing and assembly of products often involve several countries affect the US and Japan's trade statistics more than the EU's. The rapidly deteriorating performance of the latter countries in technology-driven industries is probably among other reasons due to shifting assembly of products to China, artificially blowing up China's exports and the imports of the US and Japan, as was demonstrated for Apple's iphone (Xing and Detert, 2010). The US has also been known for preferring non-trade ways for gaining from international economic activity, such as setting up subsidiaries and starting up local production (European Commission, 1998). Furthermore, one of the main drivers of the EU export performance, Germany, compensated weak domestic demand by exports whereas the US' strong domestic demand performance (at least up to 2007) led to rising imports.

Turning to services exports, the EU's performance is less positive given a drop in market share by 1.8 percentage points between 2004 and 2009. Overall service market share developments are however much more stable than manufacturing. The "old" advanced countries or regions such as the EU, the US and Japan hold up their export market shares much better in comparison with the BRIC, China manages only 5.8%, increasing by 1.5 percentage points (about as much as India's market share gain to 4%). China achieves substantial market shares only in construction, whereas India features a considerable 35.5% market share in computer services.

[4] Specialisation does not refer to revealed comparative advantage but simply to which industry types achieve higher export shares than the total of all industries in a country on average.

Figure 2: World export market share as percent, 2009



Source: UNO (Comtrade), Eurostat (Comext, EBOP). – Excluding intra-EU exports, for world definition see technical appendix - *) Brazil, Russia, India.

Table 3: World export market share as percent 2009, and change 2007/2009 and 1999 (2004)/2009 in percentage points

	EU27			USA			Japan			Brasilien			Russland			Indien			China		
	2009	Change 2007	Change 1999	2009	Change 2007	Change 1999	2009	Change 2007	Change 1999	2009	Change 2007	Change 1999	2009	Change 2007	Change 1999	2009	Change 2007	Change 1999	2009	Change 2007	Change 1999
Total industry	22.1	0.4	2.5	12.2	-0.9	-6.6	7.6	-0.8	-4.3	1.5	0.0	0.4	1.1	-0.2	0.3	2.1	0.6	1.1	16.7	1.8	11.2
Mainstream industries	26.0	-0.3	1.8	13.6	-0.2	-5.9	9.4	-1.0	-4.1	1.0	-0.1	0.2	0.6	0.0	0.1	1.3	0.2	0.7	18.7	2.1	12.6
Labour-intensive industries	16.1	-1.7	-2.2	6.6	-0.8	-4.4	5.5	0.1	-2.3	0.7	-0.4	-0.1	0.7	-0.2	0.0	6.3	2.3	2.8	28.2	2.9	16.6
Capital-intensive industries	21.1	1.0	3.2	13.5	0.4	-5.7	8.5	0.5	-1.3	2.0	0.0	0.0	3.3	-0.8	0.3	1.8	0.2	0.9	6.9	-1.3	3.9
Marketing-driven industries	19.2	-1.2	-0.9	11.3	0.3	-3.0	2.0	-0.3	-1.9	4.8	0.3	1.9	0.9	0.2	0.4	2.0	-0.1	0.5	16.2	0.6	6.4
Technology-driven industries	23.7	1.9	5.3	13.1	-2.4	-9.2	8.7	-1.6	-6.8	0.8	-0.1	0.2	0.3	0.0	0.1	1.0	0.5	0.8	17.0	2.9	13.9
High RQE	27.5	1.1	3.0	13.4	-2.5	-7.5	8.7	-1.8	-4.5	1.1	-0.2	0.2	0.3	0.0	0.1	2.7	1.1	1.5	13.9	1.9	8.7
Medium RQE	20.0	-0.4	4.7	10.6	0.1	-7.5	6.3	0.1	-5.0	1.8	0.2	0.9	0.8	0.0	0.3	1.4	0.2	0.7	22.1	2.7	16.6
Low RQE	16.5	0.4	-0.3	12.0	0.4	-4.1	7.3	-0.1	-3.0	1.9	0.0	0.1	2.4	-0.6	0.3	1.8	0.2	0.9	15.7	0.4	9.4
	2009	Change 2007	Change 2004	2009	Change 2007	Change 2004	2009	Change 2007	Change 2004	2009	Change 2007	Change 2004	2009	Change 2007	Change 2004	2009	Change 2007	Change 2004	2009	Change 2007	Change 2004
Total services	29.3	-1.6	-1.8	22.2	0.6	-0.7	5.7	0.0	-0.9	1.2	0.2	0.4	1.9	0.1	0.4	4.0	0.2	1.4	5.8	0.3	1.5
Transportation	32.2	-0.4	-1.5	13.3	0.5	-0.8	6.8	-1.3	-2.6	0.9	0.8	0.7	2.7	0.4	0.4	2.4	0.6	1.1	5.1	-1.0	1.6
Travel	19.6	-1.9	-1.9	25.0	0.2	-1.1	2.1	0.2	-1.0	1.1	1.0	0.9	1.9	0.0	0.4	2.3	0.1	0.6	8.2	0.5	1.0
Communications services	30.1	-0.4	-1.6	18.8	-0.1	-0.1	1.3	0.1	-0.4	0.7	0.6	0.9	2.6	-0.2	0.8	2.8	-2.4	-1.4	2.4	-0.2	0.7
Construction services	37.5	-2.9	-1.7	10.4	-0.4	-0.4	19.1	0.5	-3.5	0.0	0.0	0.0	5.0	-1.2	-0.2	1.3	-0.1	-0.4	14.5	4.8	9.7
Insurance services	36.0	-2.8	-2.1	25.6	4.5	4.5	1.5	-1.1	-1.6	0.7	1.1	0.3	0.8	0.0	0.1	2.7	-0.3	0.2	2.8	1.0	1.7
Financial services	34.2	-2.9	-4.7	33.4	2.8	3.9	2.9	-0.2	-1.8	0.9	0.5	0.4	0.6	0.0	0.3	2.1	0.4	1.7	0.3	0.1	0.2
Computer and information services	31.4	-1.6	-4.4	10.2	-0.9	-1.7	0.7	-0.2	-1.2	0.2	0.1	0.1	1.0	0.0	0.5	35.5	0.8	6.5	5.0	0.9	2.0
Royalties and license fees	22.0	-2.0	-1.8	56.5	2.0	2.7	13.6	-1.3	-1.2	0.3	0.2	0.1	0.3	0.1	0.1	0.1	0.0	0.1	0.3	0.0	0.0
Other business services	34.1	-1.8	-2.0	15.2	0.8	-3.2	7.2	1.2	1.1	2.4	2.0	1.4	1.9	0.2	0.8	2.3	-1.5	0.0	7.7	0.4	2.2
Personal, cultural, recreational services	23.8	1.3	-7.3	50.3	0.9	15.0	0.6	0.1	0.3	0.3	0.3	0.2	1.3	0.3	0.5	1.8	0.1	1.6	0.4	-0.7	0.2
Government services. n.i.e.	22.7	-1.5	-7.8	45.8	0.0	11.2	5.1	0.7	-2.3	3.1	2.8	2.7	1.0	0.4	0.7	0.8	0.2	-0.1	2.0	0.8	0.9

Source: UNO (Comtrade), Eurostat (Comext, EBOP). – Excluding intra-EU exports, for world definition see technical appendix.

We now turn to examining structural change between and within industries at a more disaggregated level, pointing out the relative specialisation of the EU, country groups and individual countries and the ability to upgrade existing sectors and industries.

5.2. Structural change between industries

As most indicators are relative to the EU, we first show the absolute shares of the EU itself to examine their level and change over time (Table 4). The trade indicators here include intra-EU exports and cannot be compared to the market shares above, which are based on extra-EU exports only to avoid blowing up the EU's market share by intra-EU trade. Overall, changes in export shares are not that large with the exception of exports in capital-intensive industries so that movements of individual countries in the position on the relative indicators can mostly be interpreted as caused by the countries themselves rather than being the result of the EU aggregate changing considerably, caused e.g. by strong movements of a few large countries.

It is furthermore interesting to see that in exports, technology-driven, capital-intensive and high RQE industries as well as high INNO sectors achieve much higher shares than in value added. Hence, for international markets, ways to safeguard competitive advantage in terms of compensating rising wage costs (by rising capital intensity, research and innovation, product quality, etc.) matter much more than for domestic valued added shares.

Table 4: Summary table – EU 27, shares as percent and change in percentage points

	Value added share		Export shares (%)		Share of export to BRIC in total exports (%)	
	2007	Change 2007/1999	2010	Change 2010/1999	2010	Change 2010/1999
Factor inputs						
Mainstream industries	25.5	0.7	21.7	-0.5	2.1	1.3
Labour-intensive industries	19.0	0.5	9.1	-2.4	0.6	0.4
Capital- intensive industries	14.2	1.1	22.9	5.0	1.3	1.0
Marketing-driven industries	20.8	-1.5	12.7	-0.3	0.6	0.3
Technology-driven industries	20.6	-0.8	33.6	-1.7	2.4	1.5
Revealed quality elasticity						
High RQE	37.5	0.0	46.5	-1.5	4.0	2.6
Medium RQE	36.3	-0.9	26.8	-0.7	1.4	0.9
Low RQE	26.2	0.9	26.7	2.2	1.6	1.0
INNOTYPE			2009	Change 2009/2004		
High	10.6	-0.1	27.1	-0.6		
Med-high	16.1	-0.4	41.0	-1.2		
Med	19.0	0.8	17.2	0.9		
Med-low	8.8	-0.7	7.9	0.8		
Low	16.8	1.4	6.8	0.2		
EDUTYPE						
High	17.1	2.1	13.4	1.5		
Med-high	7.0	-0.8	28.6	1.2		
Med	36.0	-2.2	24.1	-2.6		
Med-low	13.5	0.0	8.4	0.3		
Low	26.3	0.9	25.4	-0.4		

Source: Eurostat (SBS, Comext). - Export data including intra-EU exports.

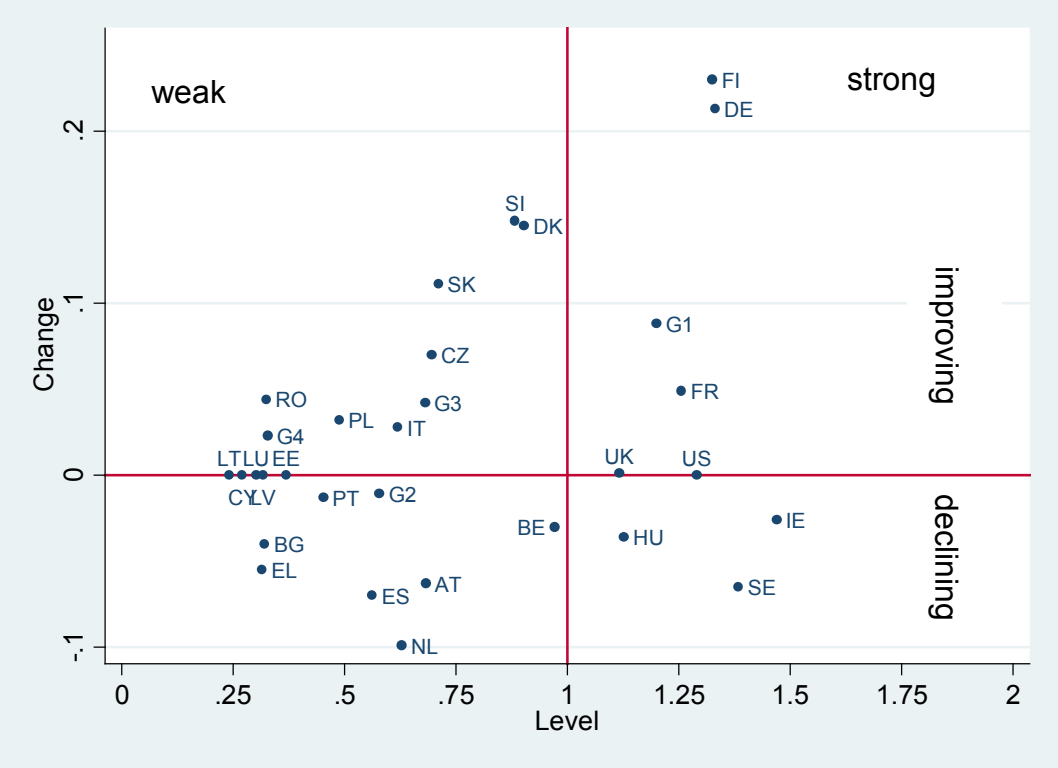
In this chapter we present a few selected indicators in figures which contrast the change and the level of the countries' indicator values with the average of the EU. Countries can be in one of four areas, i) strong and improving – meaning level and change values above the EU average, in the top right of the figure; ii) strong and declining – meaning level values above the EU average and change values below the EU average, in the bottom right of the figure; iii) weak and improving – meaning level values below the EU average and change values below

the EU average, in the top left of the figure; and finally, iv) weak and declining – meaning level and change values below the EU average. A full set of the data for each indicator by industry and/or sector type can be found in the annex tables to chapter 5.

Industry specialisation and structural change

Figure 3 compares the change and the level of relative valued added (RVA) in technology-driven industries. The share of technology-driven industries in the US is approx. 1.3 times higher than in the EU, but below the values of Ireland, Sweden, Germany and Finland. Group 1 is in the strong and improving area, while group 3 and 4 are in the weak improving one and group 2 is situated in the weak and declining area, pointing to "catching-up" tendencies for group 3 and 4. The level of group 3 is above the one of group 2 and 4. Lithuania, Cyprus and Luxembourg feature the lowest country shares, while Finland and Germany improve most and the Netherlands, Spain, Austria and Sweden lose most. Overall, however, change is slow compared with trade indicators (see below).

Figure 3: Change (1999/2007) vs. level (2007) of relative value added (RVA) in technology-driven industries



Note: No data available for MT, change for CY, EE, LV, LT, LU, MT, US not available. The intersection of the horizontal and the vertical line represents the EU-average.

Source: Eurostat (SBS).

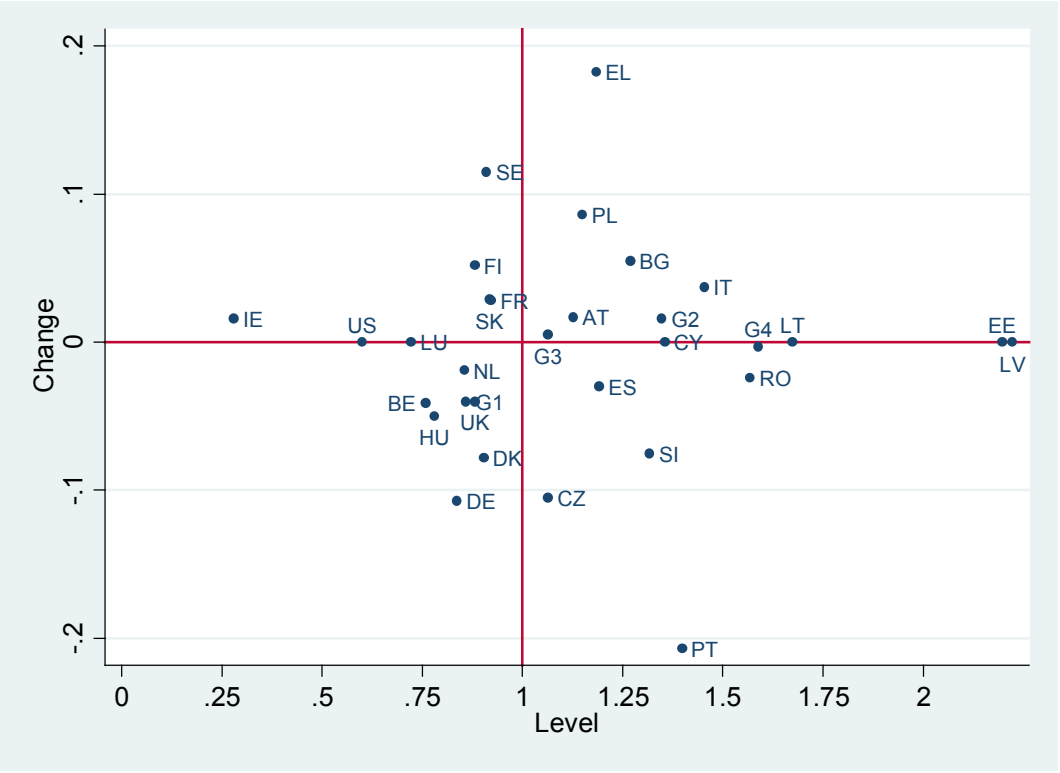
Figure 4 presents relative valued added in labour-intensive industries. It can almost be interpreted as the flipside of Figure 3, relative value added in technology-driven industries. The US is below the EU average, only above the level of Ireland. Country group 1 is in the weak and declining area, while the other three groups are in the strong area, mostly stable with the exception of country group 2 which is specialising in labour-intensive industries. Estonia and Latvia feature the highest shares, while Germany and the Czech Republic lose most, Greece and Sweden gain most.

To shed more light on the nature of labour-intensive industries, we have combined this industry type with the low-skill industries from the skill-intensity taxonomy. The resulting sub-set of the labour-intensive industries – labour-intensive and low-skill – basically amplifies differences between country group 1 and the other three. Country group 1 members such as Austria, who are specialised in labour-intensive industries, show negative specialisation in the low-skill subset, whereas other countries such as Bulgaria or Portugal show much higher relative values in this subset (full data are in Table 6).

As regards the other industry types, in mainstream manufacturing there is less variation between the groups, as would be expected, since this industry type uses a balanced mix of input factors, hence not giving a particular advantage to any factor which might lead to some countries being particularly specialised in mainstream manufacturing. Only group 4 is clearly below the average, while group 1 is slightly below and 2 and 3 are slightly above.

Turning to capital-intensive industries, group 1 and 2 feature negative, group 3 and 4 positive specialisation. This reflects the higher importance of capital accumulation in the growth patterns of catching-up countries. We expect a different picture in trade indicators, as there the reduced importance of wage costs might imply positive trade specialisation for richer countries.

Figure 4: Change (1999/2007) vs. level (2007) of relative value added (RVA) in labour-intensive industries



Note: No data available for MT, change for CY, EE, LV, LT, LU, MT, US not available, change in relative value added (RVA) of GR was cut to a half to improve the graphical representation. The intersection of the horizontal and the vertical line represents the EU-average.

Source: Eurostat (SBS).

In marketing-driven industries, group 1 and 3 are below, while group 2 is a little bit above and group 4 considerably above the EU average. This contrasts with the intended grouping of these industries to show potential for endogenous strategic product differentiation by way of creating sunk costs in advertising. The reason for this can be seen in the share of food and clothes (e.g. footwear) industries in this subset of industries. In the US, on which this taxonomy is based, these industries are marketing-driven – think Kellogs and Nike, but in

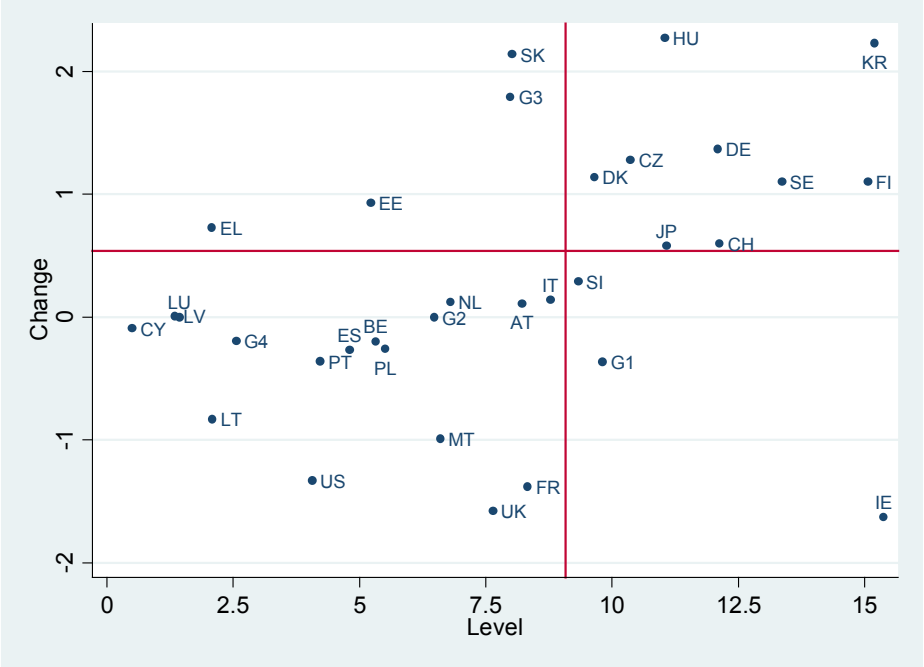
group 4 they are more likely to reflect low labour costs and hence assembly lines for products designed elsewhere (shoes – Romania achieves an RVA of 6 in the footwear industry) and/or basic production for the home market. We would expect to find a somewhat different picture for marketing-driven industries in trade indicators, similar to capital-intensive industries, where international demand usually matters more than domestic demand.

Using the RQE taxonomy basically provides a similar picture, with country group 1 specialised in high RQE sectors and country groups 3 and 4 in low RQE sectors. However, the extent of specialisation is much lower, showing RVA close to 1 for a range of industry types.

Figure 5 and Figure 6 show the value added shares of high INNO and high EDU sectors, hence representing services sectors in addition to manufacturing (full data are in Table 7 and Table 8). Classic "manufacturing" countries such as Germany, Japan and Korea are much better in the INNO taxonomy than in the EDU one, where classic "services" countries such as Great Britain excel. This is because in the INNO taxonomy, the highly innovative sectors are basically the "high-tech" sectors 30 to 33 (computers, communication equipment...), machinery (29) and software (72) as well as R&D (73); in the EDU taxonomy, the only manufacturing sector classified as high EDU is sector 30 (computers), whereas the other ones are services sectors (65 financial intermediation, 72 and 73 as above and 74 business services). Probably the way innovation is measured in the CIS (on which the INNO taxonomy is based) leads to a higher distribution of innovative firms in manufacturing sectors than in services sectors; whereas the shares of highly educated employees are on average higher in innovative services than in manufacturing, because there production processes usually imply substantial shares of blue collar workers.

Overall, Korea, Japan and Switzerland feature a higher share of high INNO sectors than the EU, while the US shows a lower share; country group position is similar to the RVA indicator for technology-driven industries: group 1 is strong but declining, whereas country group 3 is weak but improving quickly, group 2 and 4 are like the US in the weak and declining area. Only Switzerland has a higher share of value added in the high EDU sectors than the EU; group 1 is strong and improving, groups 3 and 4 are weak and improving, group 2 is weak and declining, however in terms of level still ahead of groups 3 and 4.

Figure 5: Change (1999/2007) vs. level (2007) of value added (shares) in high-innovation sectors



Note: Change in value added share of IE was cut to a third to improve the graphical representation. The intersection of the horizontal and the vertical line represents the EU-25.

Source: OECD (STAN), EU KLEMS.

Figure 6: Change (1999/2007) vs. level (2007) of value added (shares) in high-education sectors

Note: Change in value added share of GB was reduced by a factor of 1.8 to improve the graphical representation. The intersection of the horizontal and the vertical line represents the EU-25.

Source: OECD (STAN), EU KLEMS.

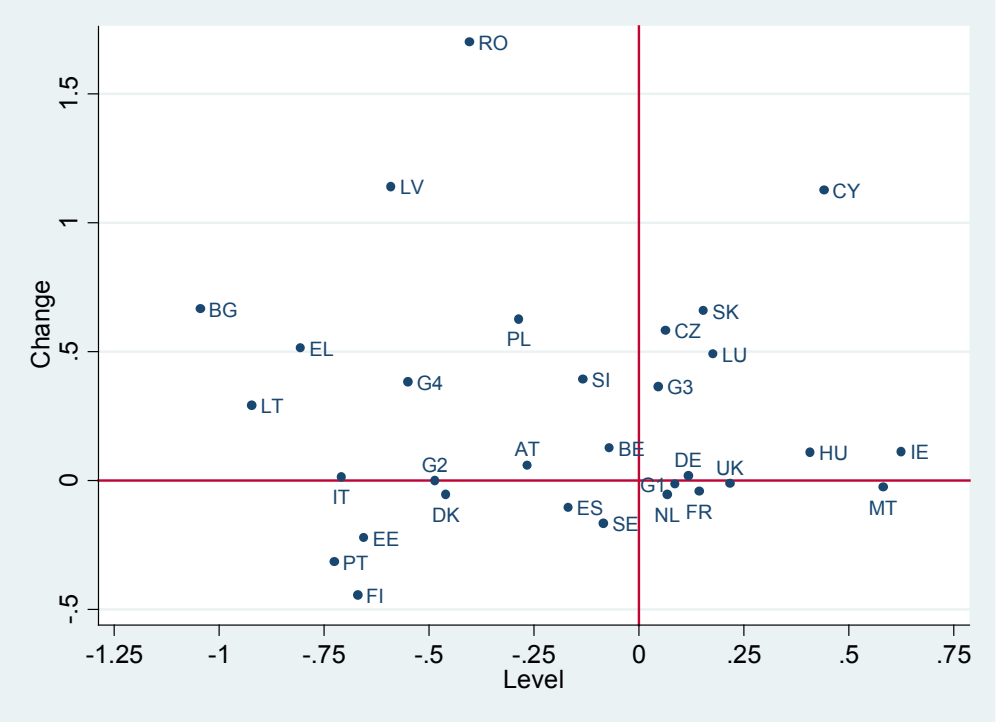
The shares in low INNO and low EDU are similar to the pattern of shares in labour-intensive industries, with group 1 and the US featuring low shares.

Trade specialisation and structural change

We proceed in the same order as with industry specialisation, showing first the indicators at the 3-digit level and then for the 2-digit level, including services. As our trade data for manufacturing go up to 2010, we will report two sets of figures, the first one to illustrate change over the total time period (1999-2010) and the second to illustrate changes during the crisis years (2007-2010). Full data tables are again in the appendix to this chapter.

Figure 7 positions countries and groups according to their revealed comparative advantage in technology-driven industries (Table 9). In contrast with relative value added, group 3 achieves positive and improving specialisation in technology-driven industries, while group 1 is positive and stable; this relationship is mirrored by group 2 and 4, both in the weak area, but group 4 improving while group 2 is stable. Group 3 thus seems to be well integrated with the supply chains of advanced firms in group 1, as is well known for example in the automobile industry. Group 3 may thus be seen as a form of "China" of the EU. It remains to be seen whether trade specialisation is a predictor of future industry specialisation as measured by value added shares.

Figure 7: Change (1999/2010) vs. level (2010) of revealed comparative advantage (RCA) in technology-driven industries



Note: The intersection of the horizontal and vertical line in the origin represents the EU-average.

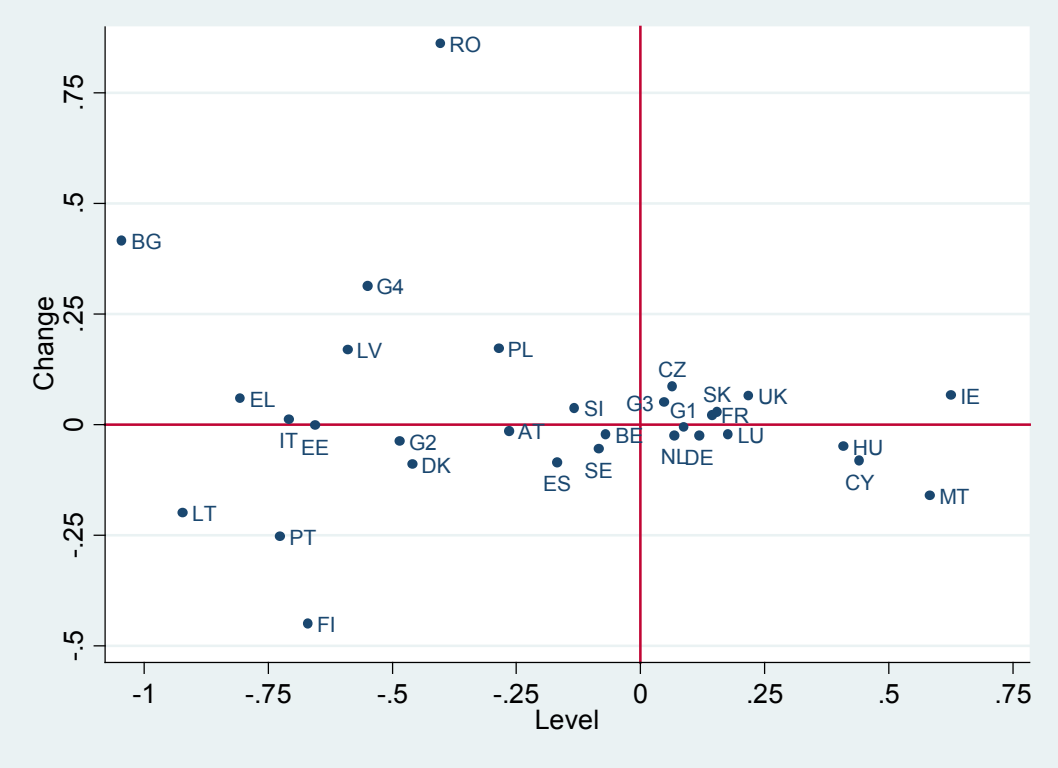
Source: Eurostat (Comext). - Including intra-EU exports.

Ireland and Malta feature the highest shares of exports by technology-driven industries, Bulgaria and Lithuania the lowest; Romania, Latvia and Cyprus are improving, Finland and Portugal declining most rapidly.

Figure 8 repeats the exercise for the crisis years 2007 to 2010. With the exception of Romania and Bulgaria (and hence group 4) as well as Finland, changes are much smaller than in the total time period, whereas a big impact of the crisis would point to larger changes in a short time period: most countries are grouped much closer to the zero change line and keep their change trend, with the exception of Cyprus. The Finnish decline is caused by industry 322 (TV, radio transmitter, line telephony), most likely reflecting Nokia's troubles with smartphones and not the global financial crisis. As a consequence, the crisis seems to have accelerated structural change towards technology-driven industries in Romania and Bulgaria, however this assessment would need more thorough investigation.

Figure 9 shows RCA in labour-intensive industries. As with relative value added, this figure is almost the "opposite" of RCA in technology-driven industries. Group 1 is weak and stable, while the other groups are all strong with the same order (highest level group 4, then group 2, then group 3) but declining; the change of RCA of group 3 and 4 is substantial. Estonia, Latvia and Romania feature the highest, Ireland and Malta the lowest levels; Spain and Denmark grow most, Malta and Cyprus least. Looking at the development during the crisis (Figure 10), the change is again much smaller than during the whole period and most countries keep their trend with the exception of Malta, indicating that the impact of the crisis on trade specialisation was limited.[5]

Figure 8: Change (2007/2010) vs. level (2010) of revealed comparative advantage (RCA) in technology-driven industries

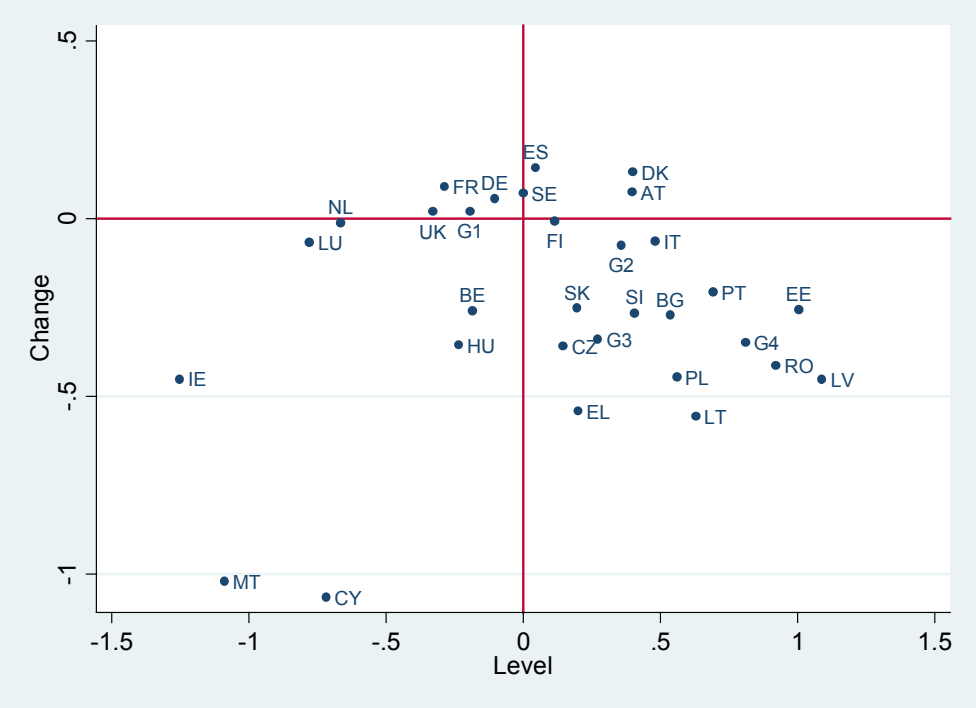


Note: The intersection of the horizontal and vertical line in the origin represents the EU-average.

Source: Eurostat (Comext). - Including intra-EU exports.

[5] When interpreting the figures, care should be taken to examine the spread of the y-axis, i.e.the magnitude of the change – making that spread equal across figures would compress the figures too much.

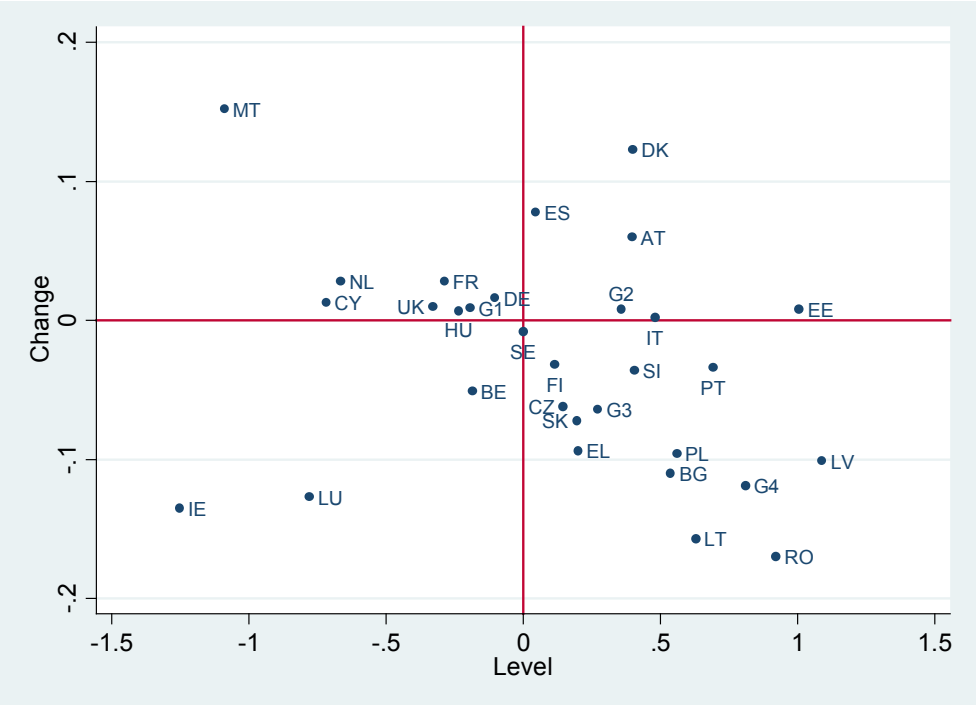
Figure 9: Change (1999/2010) vs. level (2010) of revealed comparative advantage (RCA) in labour-intensive industries



Note: Level of revealed comparative advantages (RCA) of IE was reduced by a factor of 1.5 to improve the graphical representation. The intersection of the horizontal and the vertical line in the origin represents the EU-average.

Source: Eurostat (Comext). - Including intra-EU exports.

Figure 10: Change (2007/2010) vs. level (2010) of revealed comparative advantage (RCA) in labour-intensive industries



Note: Level of revealed comparative advantages (RCA) of IE was reduced by a factor of 1.5 to improve the graphical representation, the intersection of the horizontal and vertical line in the origin represents the EU-average.

Source: Eurostat (Comext). - Including intra-EU exports.

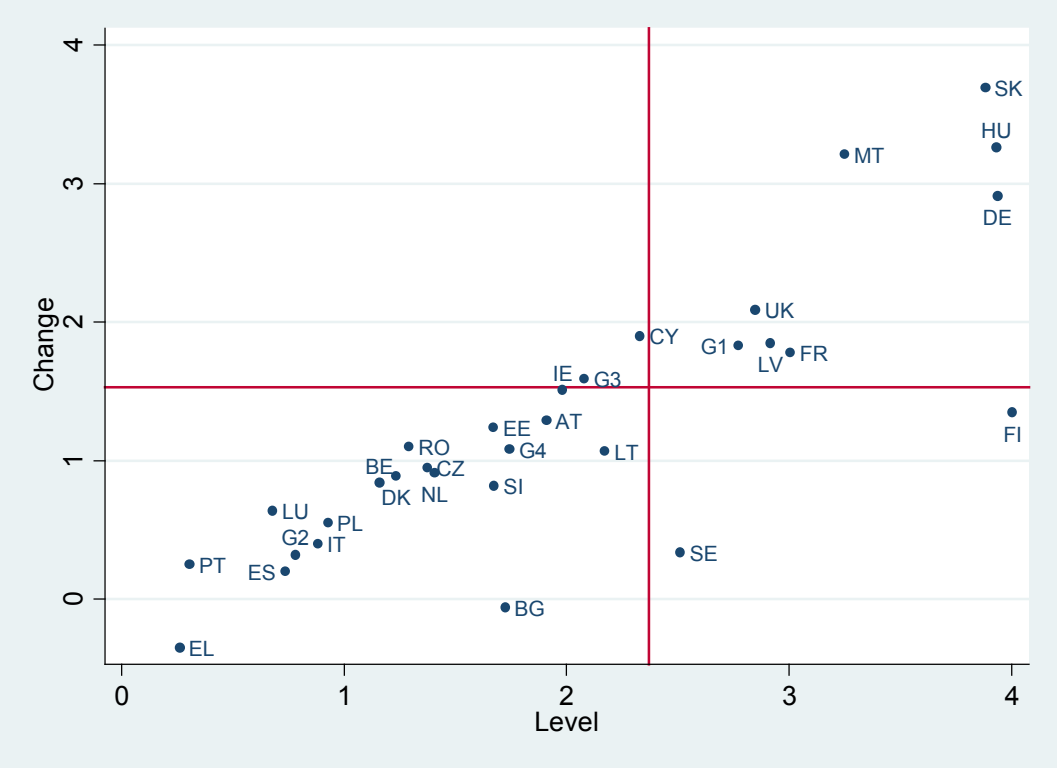
Concerning other industries types, mainstream manufacturing shows approx. the same pattern as in the value added indicator (corresponding to the relationship of this industry type at the EU level between value added and export shares). Marketing-driven and capital-intensive industries show different patterns, as hypothesized. In marketing-driven industries, only group 2 now shows positive specialisation, pointing to the success of Italian, Spanish, Greek, Portuguese and Cypriot brands in such industries as food and clothes (all of these countries achieve a positive specialisation in marketing-driven industries). In capital-intensive industries, group 1 and 2 now show (slightly) positive specialisations, while group 3 shows a negative specialisation.

Country group specialisation in high-RQE industries relative to low-RQE industries corresponds to the contrast between technology-driven and labour-intensive industries, with group 1 and 3 positive in high RQE and only group 1 negative in low RQE.

Figure 11 shows exports to Brazil, Russia, India and China (BRIC) in technology-driven industries as a share of total exports to the BRIC. Technology-driven industries are the main industry type in exports to BRIC, accounting for 33.7% of exports, followed by mainstream manufacturing at 30.1%, capital-intensive industries at 19.2% and labour-intensive as well as marketing-driven industries at around 8% (8.9% and 8.2%). Accordingly, trade specialisation in technology-driven and mainstream manufacturing industries helps with reaping growth opportunities presented by the economic dynamics of the BRIC. As the BRIC are very likely to continue growing at a high pace, this could have significant consequences for trade specialisation and growth prospects triggered by exports. In particular, countries specialised in labour-intensive and marketing-driven industries – e.g., country group 2 (with the exception of Cyprus and Italy, which is specialised in mainstream manufacturing) – may see dampened growth prospects.

Change in exports to BRIC is proportional to level, indicating that in 1999, exports to BRIC were at a very low level. The exceptions are Finland and Sweden, which despite high levels gained before 1999 achieve only slow growth. As with RCA in technology-driven industries, group 1 and 3 are improving, while group 4 and 2 are declining. Finland and Germany have the highest levels, closely followed by Hungary and Slovakia, while Greece and Portugal have the lowest ones. The full data is in Table 10.

Figure 11: Change (1999/2010) in percentage points vs. level (2010) of exports to BRIC in total exports in technology-driven industries as shares in %

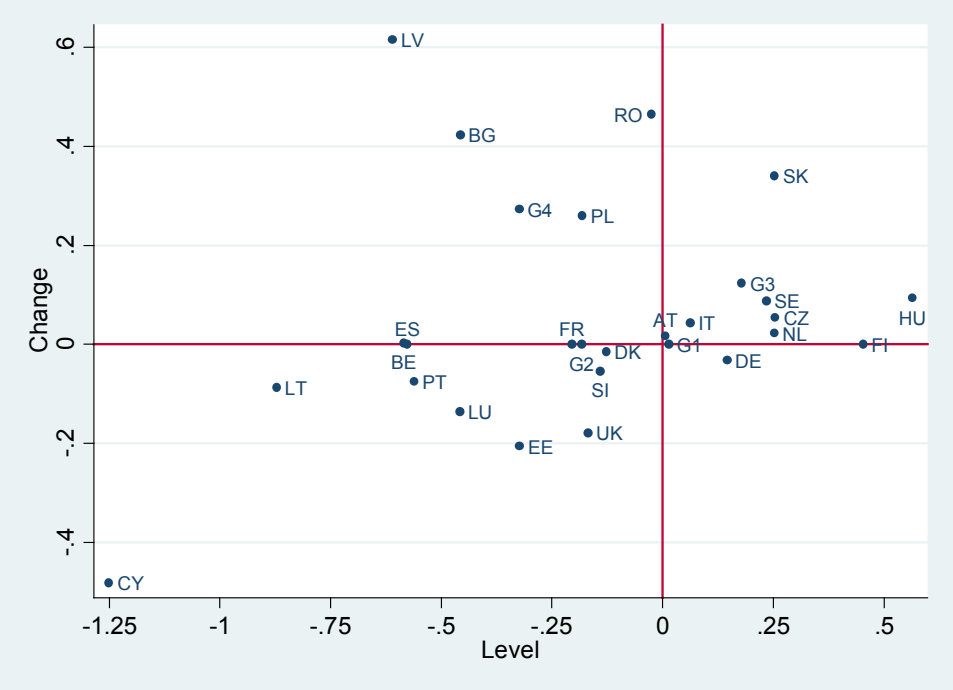


Note: Level of export shares to BRIC in total exports of LT, LV was reduced by a factor of 1.7 to improve the graphical representation. The intersection of the horizontal and the vertical line represents the EU 27.

Source: Eurostat (Comext). - Including intra-EU exports.

We now turn to revealed comparative advantage in manufacturing and services sectors, using the INNO and EDU taxonomies to build sector types (Table 11). As with relative value added, the RCA of countries in high INNO sectors shows similar patterns as the RCA of countries in technology-driven industries (Figure 12). Country group 1 and 3 are above average, with group 2 and 4 below average, but group 4 improving. Countrywise, Italy is in the strong and improving area, due to its strong position in machinery. The RCA of countries in high EDU sectors is similar to relative value added quite different to the INNO ranking, as services sectors such as financial intermediation and business services dominate the high EDU sector type (Figure 13). Hence, countries such as Cyprus, Luxembourg and Great Britain top the RCA values in terms of level, while Poland and Romania gain most quickly.

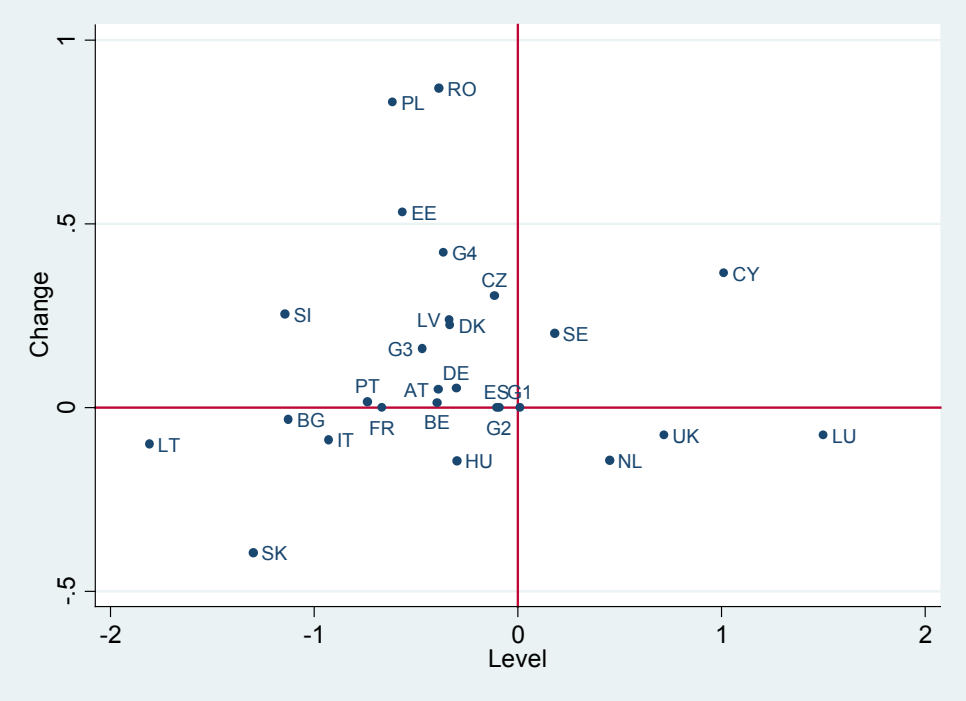
Figure 12: Change (2004/2009) vs. level (2009) of revealed comparative advantage (RCA) in high-innovation sectors



Note: No data available for EL, IE, MT, change for FI, FR, ES, G1, G2 not available. The intersection of the horizontal and the vertical line in the origin represents the EU-average.

Source: Eurostat (Comext). - Including intra-EU exports.

Figure 13: Change (2004/2009) vs. level (2009) of revealed comparative advantages (RCA) in high-education sectors



Note: No data available for FI, EL, IE, MT, change for FR, ES, G1, G2 not available. The intersection of the horizontal and the vertical line in the origin represents the EU-average.

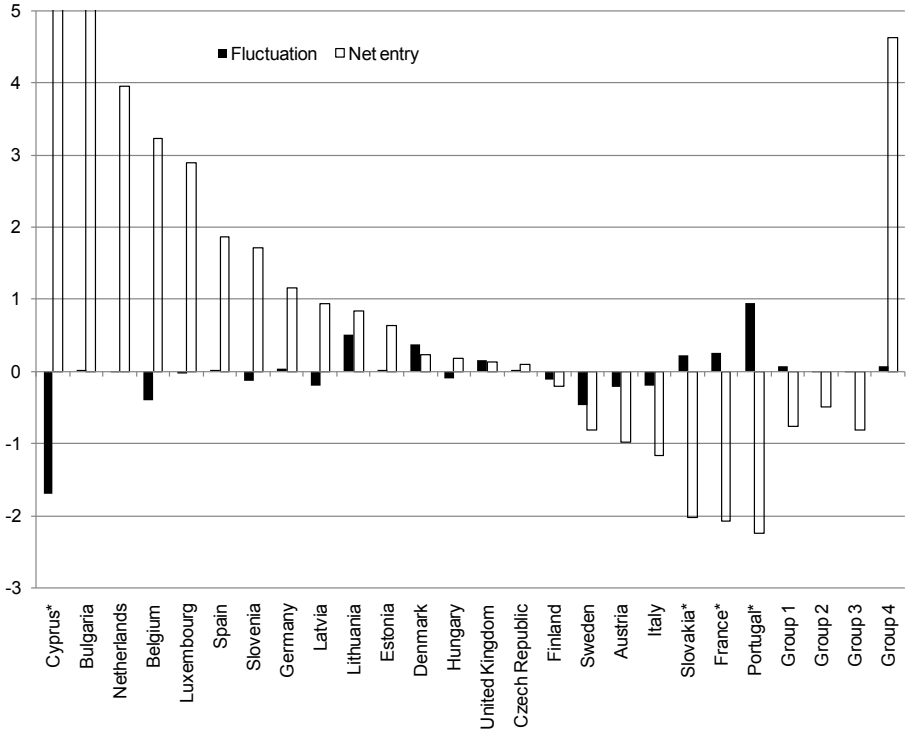
Source: Eurostat (Comext). - Including intra-EU exports.

Firm demography indicators

The fluctuation of firms by sector – the sum of the birth and death rate – relative to the EU average as well as the net entry rate relative to the EU may provide clues as to which sectors face strong business dynamism. High net entry rates in highly innovative sectors would point to vigorous innovative firm activity with the corresponding consequences for growth prospects. The data are however somehow experimental – they are provided by Eurostat not least against the background of Europe 2020 and its goal of high-growth firms, but in most countries only one or two years are available.

Figure 14 shows relative fluctuation and relative net entry. Relative Fluctuation and net entry are calculated differently (see technical appendix) so that their levels should not be compared directly. In both cases, values above 0 mean above the EU average. There is little difference across country groups as regards fluctuation, but group 4 shows high relative net entry, whereas the other groups are below the average. This is consistent with the catching up character of group 4, where usually many new successful businesses are started up. In the other country groups high fluctuation leads mainly to a replacement of existing producers, partly related to entrepreneurial experimentation, partly related to the turbulence of small firms usually found at the competitive fringe of industries.

Figure 14: Relative Fluctuation and net entry in highly innovative sectors, average 2006/07



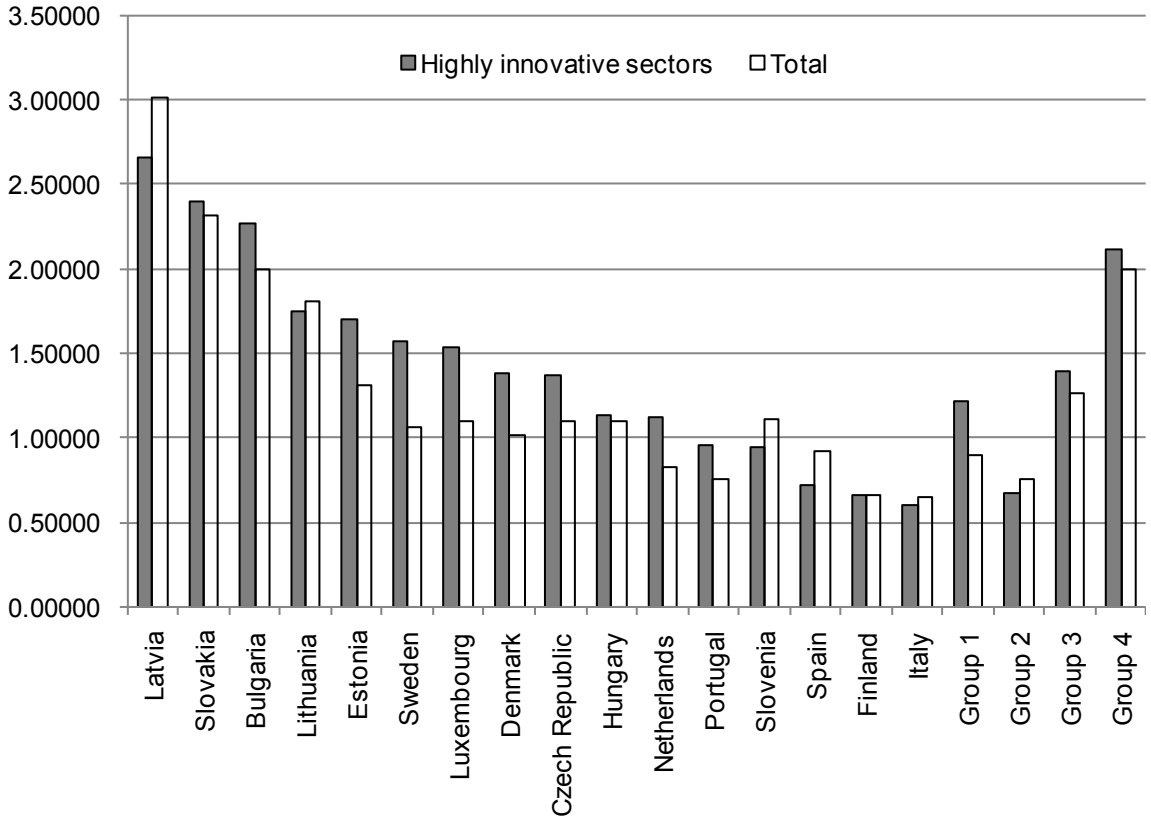
Group 1: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Netherlands, Sweden, United Kingdom. - Group 2: Greece, Italy, Luxembourg, Portugal, Spain. - Group 3: Czech Republic, Hungary, Poland, Slovakia, Slovenia. - Group 4: Bulgaria, Cyprus, Estonia, Latvia, Lithuania, Romania. - *net entry/4

Source: Eurostat (SBS).

High growth firms can be measured in turnover and in employment. Both have drawbacks: turnover figures may be distorted due to different accounting rules and deflators, and their meaning may differ according to whether turnover results from production or trade activity (it may be easy to quickly boost turnover from activities such as wholesale trade). Employment figures may be distorted by different use of part-time work, or temporary work on a leasing

basis. As employment data feature higher country coverage (they include Spain), we opt to present high growth firms measured in employment. Figure 15 shows the share of high growth firms measured by employment. At the moment, 16 countries collect the data (15 as regards high growth firms measured by turnover), but over time country coverage should become much better as the share of high growth firms is a core goal of the EU2020 strategy. In countries close to the technological frontier, we would expect firms to follow innovation-based growth strategies disproportionately, hence we expect to find a higher share of high growth firms in highly innovative sectors, while in countries further away from the frontier firms pursue different growth strategies. Indeed, Figure 15 shows a higher share of high growth firms in highly innovative sectors than in total for group 1 and the opposite picture in group 2. In groups 3 and 4, the share of high growth firms in highly innovative sectors is also higher than in total, but not as much as in group 1; moreover, it is lower than total in the educationally highly intensive sectors (see table 14). Due to a lack of data, we cannot test this for significance though. As for relative net entry, group 4 features the highest share of high-growth firms, consistent with their fast growing economies. Overall, due to the lack of a time series and the reduced country coverage, the firm demography indicators are limited in their explanatory power. As the time series becomes longer and more countries provide firm demography data, this should change. The full data are in annex tables Table 12 to Table 15.

Figure 15: Share of high growth firms relative to EU, measured in employment 2007



Group 1: Denmark, Finland, Netherlands, Sweden. – Group 2: Italy, Luxembourg, Portugal, Spain. - Group 3: Czech Republic, Hungary, Slovakia, Slovenia. - Group 4: Bulgaria, Estonia, Latvia, Lithuania.

Source: Eurostat (SBS).

Summary of "between" indicators

Indicators reflecting structural change and specialisation in industry as well as in foreign trade yield rather clear-cut results. Focusing on the most "demanding" industries and sectors in terms of required firm capabilities (technology-driven, high RQE, high INNO, high EDU), in

both industry and foreign trade and using all four taxonomies at the industry and at the sector level, group 1 achieves above average values in terms of level relative to the EU, while group 2 and 4 achieve below average values. Group 3 is below average in valued added indicators and above average in some trade indicators (technology-driven industries), pointing to the integration of firms located in group 3 with the supply chains of advanced, internationally active firms. In terms of dynamics, group 1 is rather stable, while group 3 and 4 usually improve, pointing to catching up. Group 2 is broadly speaking declining. The high EDU sector type favours countries featuring strong specialisation in innovative or educationally intensive services sectors, while the high INNO sector type is more in line with relative positions in the technology-driven manufacturing industries.

When international comparison is available, the US, Japan, Korea and Switzerland are usually above the average EU-level but below the top EU countries. The picture is almost reversed – for country groups and for non-EU-countries - when instead labour-intensive, low RQE or low INNO and low EDU industries are examined.

Firm demography indicators have limited value due to the nascent character of comparable firm demography data across the EU, which should change for the better over time. The fast growing economies of group 4 feature a high share of high growth firms, relative net entry is in comparison with the total higher in innovative sectors for countries close to the technological frontier (group 1) and lower in countries further away from the frontier (group 4).

5.3. Structural change within industries

Quality content of exports

In this chapter we present only one indicator in a figure which contrasts the change and the level of the countries' share of exports in the low price segment with the average of the EU. Table 17 in the annex also shows the data for share of exports in the high price segment, but we think that the share in the low price segment is most appropriately reflecting country performance in terms of position on the quality ladder and in terms of upgrading over time. This is mainly because some countries achieving high shares of exports in high price segments also display high shares of exports in low price segments, in particular among the new Member States, pointing to quickly changing industrial structures with parts exporting high quality products, but other parts more anchored in the countries' past.

A low share in the low price segment signals a desirable outcome. Therefore, the interpretation of the four areas in Figure 16 differs from the former interpretations of the RVA and RCA indicators. Now countries in the BOTTOM LEFT area of the figure – this means level and change values BELOW the EU average - can be interpreted as strong and improving. The remaining three areas are ii) strong and declining – meaning level values BELOW the EU average and change values ABOVE the EU average, in the top left of the figure; iii) weak and improving – meaning level values ABOVE the EU average and change values ABOVE the EU average, in the bottom left of the figure; and finally, iv) weak and declining – meaning level and change values ABOVE the EU average. A full set of the data including the share in the high price segment can be found in the annex tables Table 16 and Table 17 to chapter 5.

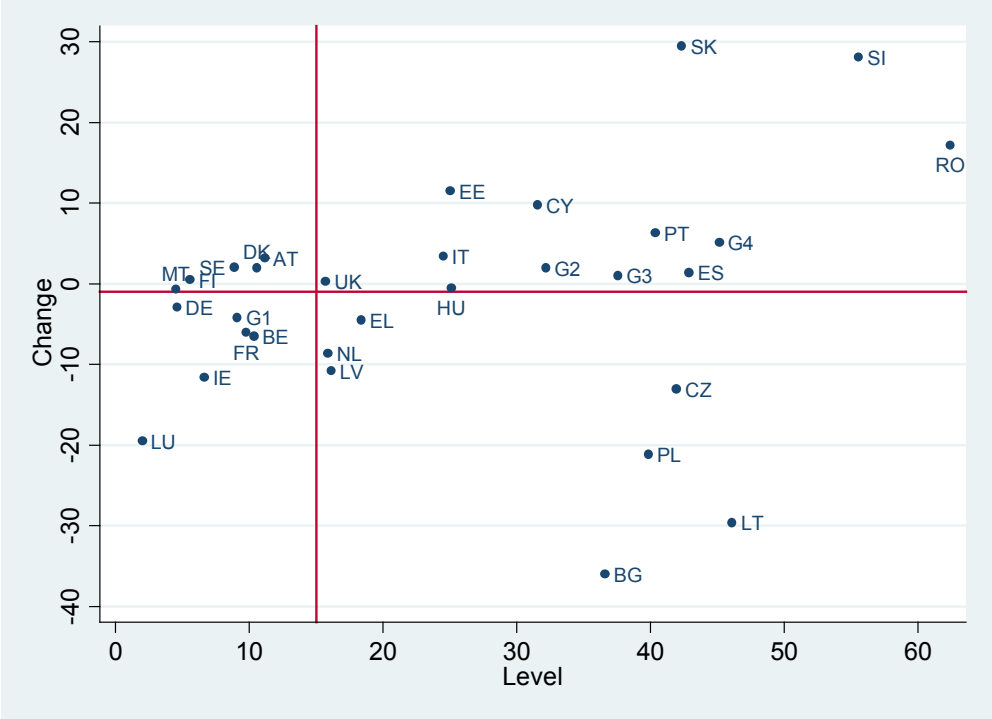
Figure 16 shows the shares in low price segments of technology-driven industries. The usual hierarchy of groups emerges, with group 1 strong and improving and group 2, 3 and 4 weak (and slightly) declining. However, group 2 is in terms of level ahead of group 3 and 4. Luxembourg, Malta and Germany show the lowest levels, but the exports from Luxembourg and Malta are very small, possibly leading to measurement error (see the technical appendix for details of the methodology). The range of change is considerable over time, showing

strong gains and losses for some countries, mostly new Member States, while group 1 countries are rather stable in the strong area. To appropriately interpret the change over time and hence intra-industry quality upgrading, it is best to refer to the measure for total industries (Table 16), which shows practically stable shares for group 1, slightly deteriorating shares for group 2 and strongly improving shares for group 3 and 4. This points to catching-up in group 3 and 4, and problems with competitive adjustment in group 2, hence within-industry indicators reach the same conclusion as between industries indicators in this regard.

Figure 17 repeats the exercise for labour-intensive industries. The main difference is that group 2 is now in the strong area, mainly due to the good performance of Italy, which is just behind Ireland and Italy; and that many more countries now display substantial increases in performance, i.e. a drop in the share of exports in the low-price segment. This shows that many countries react to rising competition in labour-intensive industries from low-wage countries, which is evident in the drop of the EU's market share in this industry type (see Figure 2), by improving the quality of their products. The quality performance in labour-intensive industries also explains how Italy manages to sustain exports in this industry type, and also how Italy achieves relatively high GDP per capita in industrial and sectoral structures which are only poorly associated with firm capabilities. Moreover, even in labour-intensive and low-skill industries, in which Italy is heavily specialised, it seems to be possible to defend competitive advantage in terms of product quality. However, this is of course no guarantee for the future. More generally, the data are in line with evolutionary theories of firm and industrial evolution, according to which technology or routines developed by firms to achieve product quality cannot be copied that easily. A high share of tacit knowledge involved in production – even in e.g. textiles – means that any diffusion of this knowledge is tied learning by doing which implies a learning process during production. Such processes usually take time, just like Italian firms have accumulated their routines and recipes for production over decades. Hence, while competitive pressure is certainly rising and the EU does lose market share in labour-intensive industries, the potential for upgrading by EU firms in all kinds of sectors and the time it takes for firms from emerging countries to reach the same level of firm capabilities should not be underestimated.

Overall, the quality indicators confirm the analysis from the between indicators, i.e. industrial structure can be interpreted as a proxy for competitiveness. However, there are important refinements – some group 1 member countries such as Denmark and Austria, featuring negative specialisation in technology-driven industries, achieve good quality performance; the same holds true for Italy. This points to the fact that competitiveness can be sustained in "traditional" structures, on the condition of high quality.

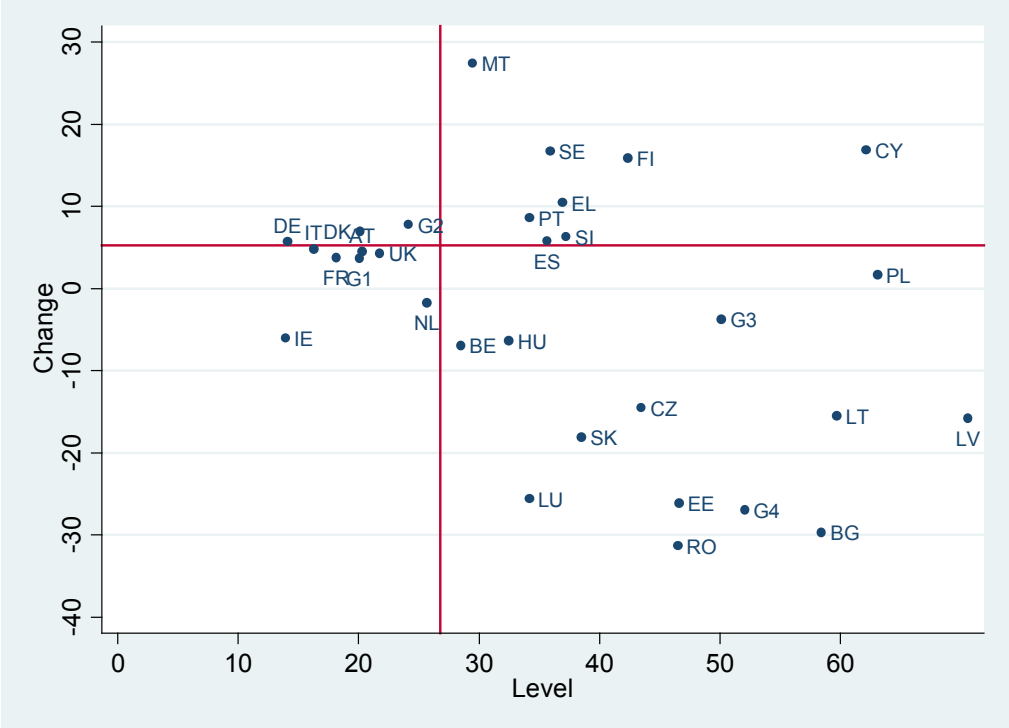
Figure 16: Change (1999/2009) in percentage points vs. level (2009) of low price segments in technology-driven industries as shares in %



Note: The intersection of the horizontal and the vertical line represents the EU 27.

Source: Eurostat (Comext).

Figure 17: Change (1999/2009) in percentage points vs. level (2009) of low price segments in labour-intensive industries as shares in %



Note: The intersection of the horizontal and the vertical line represents the EU 27.

Source: Eurostat (Comext).

5.4. Indicators capturing both within and between effects

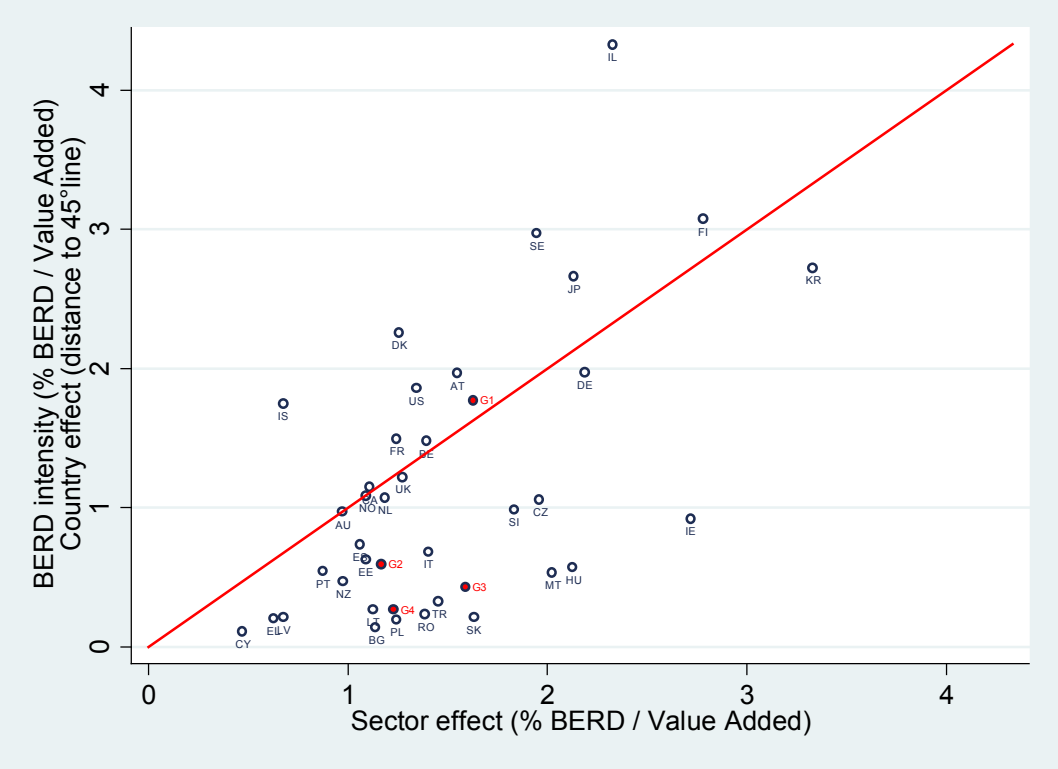
R&D decomposition

Direct comparisons of R&D expenditures relative to GDP are flawed as especially the business R&D expenditures (BERD) are heavily influenced by the industrial structure of each country. This is definitely one area where taking into account structural indicators improves monitoring of economic aggregates. The decomposition of business R&D intensity into a sector effect and a country effect allows for appropriate assessments of the level and change of R&D intensity over time, both showing structural change between sectors and sectoral upgrading in terms of rising (or falling) R&D intensities.

Figure 18 situates all the EU countries with the exception of Luxembourg and a variety of non-EU countries relative to the size of their country and sector effect. Countries above the 45°-line show a positive country effect, meaning that the sum of their sectoral R&D intensities is above the sectoral R&D intensities averaged across a set of benchmark or frontier countries (see technical appendix for details). The size of the country effect corresponds to the vertical distance between the 45°-line and the individual countries. If the country effect of countries is below this line, it is negative, meaning that sectoral R&D intensities are below the average of the benchmark countries. The sector effect (horizontal distance from the origin) reflects the industrial structures of countries, including manufacturing and services sectors. As it is based on average R&D intensities across a set of benchmark countries, it cannot be compared directly to the "between"-analysis above; nevertheless, we find some familiar patterns, both with the between indicators and the quality indicator. Group 1 is above the line, while group 2, 3 and 4 are below the line, in principle lending support to the view that structural specialisation is related to innovative ability or at least to the intensity of R&D investment. The hierarchy among country groups is identical to the quality indicators, where group 2 was ahead of group 3 and 4, contrasting with the between indicators, where group 2 usually is behind group 3.

At the country level, some countries specialised in knowledge-intensive structures such as Ireland and Hungary are well below the line, but some countries featuring less-knowledge intensive structures – e.g. within group 1, Denmark and Austria, feature high R&D intensities. Again, as with quality indicators, this comes as qualifier that while industrial structure is an important analytic tool, it is advisable to complement it with indicators measuring within structural change or sectoral upgrading. By adding within indicators to between indicators, we find important clues as to why countries featuring structures which are only poorly associated with advanced firm capabilities and the potential for future growth prospects manage to sustain high incomes per capita, and the other way around – why countries featuring structures which seem to indicate advanced firm capabilities have not reached a high level of income per capita, an indication that these countries work in less technology intensive value chain segments.

Figure 18: R&D decomposition: country and sector effect 2007



Source: Eurostat, OECD.

Figure 19 plots the changes in the country and sector effect for the old EU-15 Member States, Figure 20 for the new EU-12 Member States and Figure 21 for the non-EU countries. The diverse and combined trajectories of the country and sector effect become clearly visible. They are the combined effect of three different components which are listed in Table 18 in the annex.

The first component corresponds to pure structural change (the "between" component), showing the shifts of value added at the country level while holding the sectoral, average cross-country R&D intensities constant. In the figure, this is indicated by purely horizontal movement;

The second component is pure sectoral R&D intensity change (the "within" component), showing the change in the R&D intensity of the countries' sectors while holding the sectoral, average cross-country value added shares constant. In the figure, this indicated by purely vertical movement;

The third component is the interaction of the within and between component, the product of the difference between country sector R& intensity and average cross-country R&D intensity and the difference between country sector value added shares and average cross-country value added shares. At the sector level, this component is

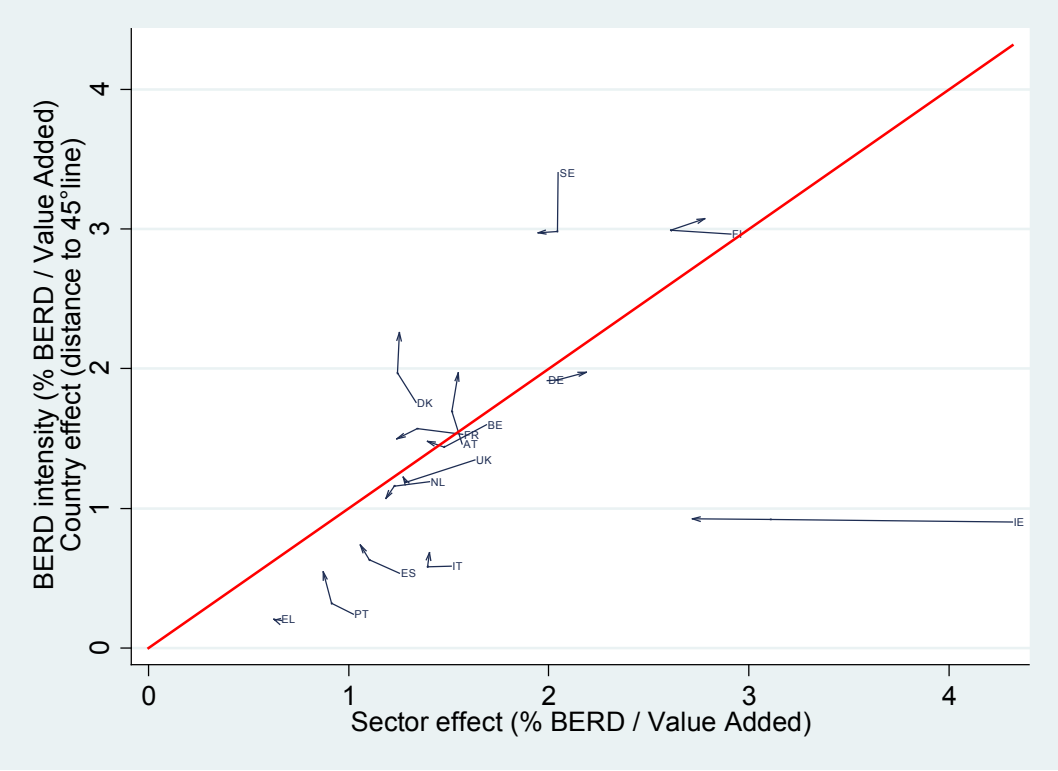
- positive, when
    - both differences are negative - i.e., the country loses value added shares in industries which show below average R&D intensity;
    - both differences are positive – i.e., the country gains value added shares in industries which show above average R&D intensity;

- negative, when
    - the country loses value added share in industries which are above R&D intensity;
    - the country gains value added share in industries which are below R&D intensity;

In the figure, the component is summed over sectors and indicated by diagonal movements.

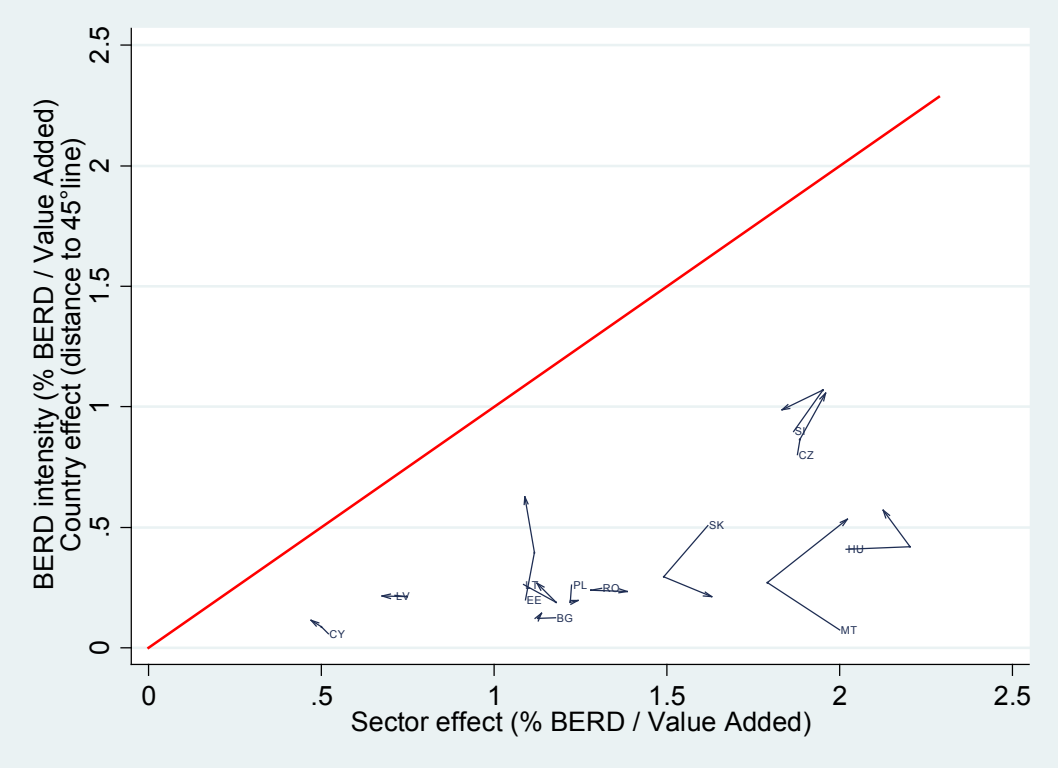
Figures Figure 19 to Figure 21 show that countries move in all possible directions, some featuring rising R&D intensity without much structural change (E.g., Austria, Denmark, Estonia, Malta, Korea), some featuring mainly structural change without changing R&D intensity (e.g., Ireland, Germany, Latvia, Canada), some featuring both changing structures and R&D intensity (e.g., UK, Spain, Portugal, Czech Republic, Israel).

Figure 19: R&D decomposition: Change in country and sector effect, EU-15 (Old Member States), 2007 vs. 2000



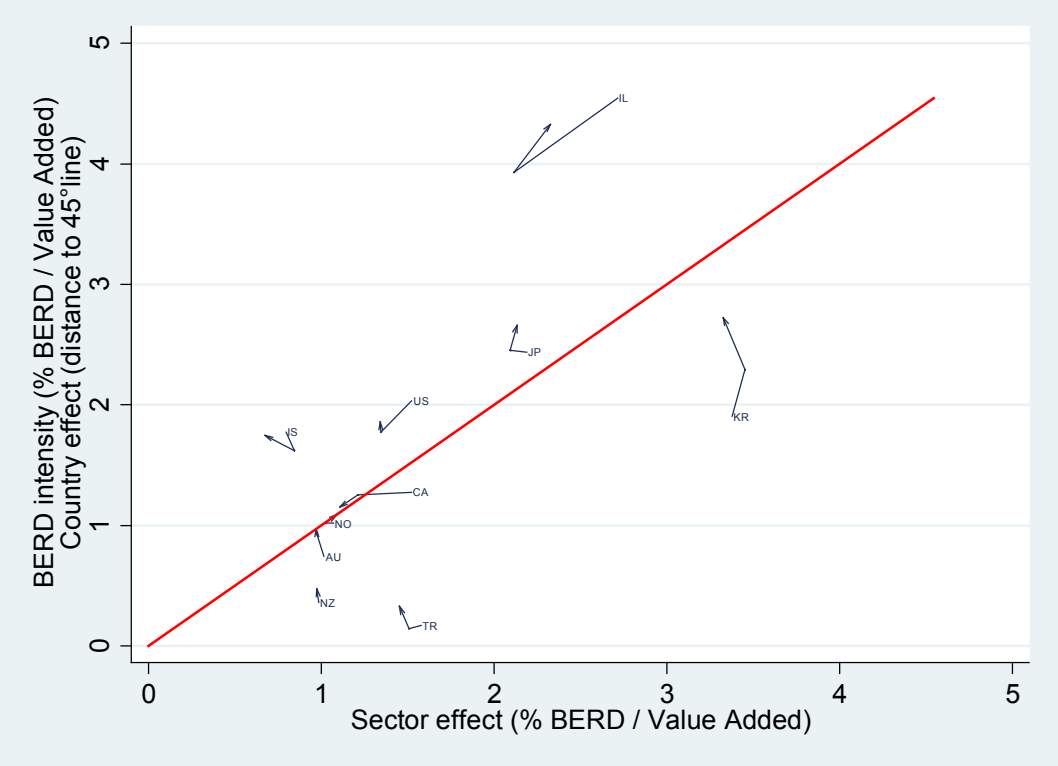
Source: Eurostat, OECD.

Figure 20: R&D decomposition: Change in country and sector effect, EU-12 (New Member States), 2007 vs. 2000



Source: Eurostat, OECD.

Figure 21: R&D decomposition: Change in country and sector effect, non-EU-countries, 2007 vs. 2000



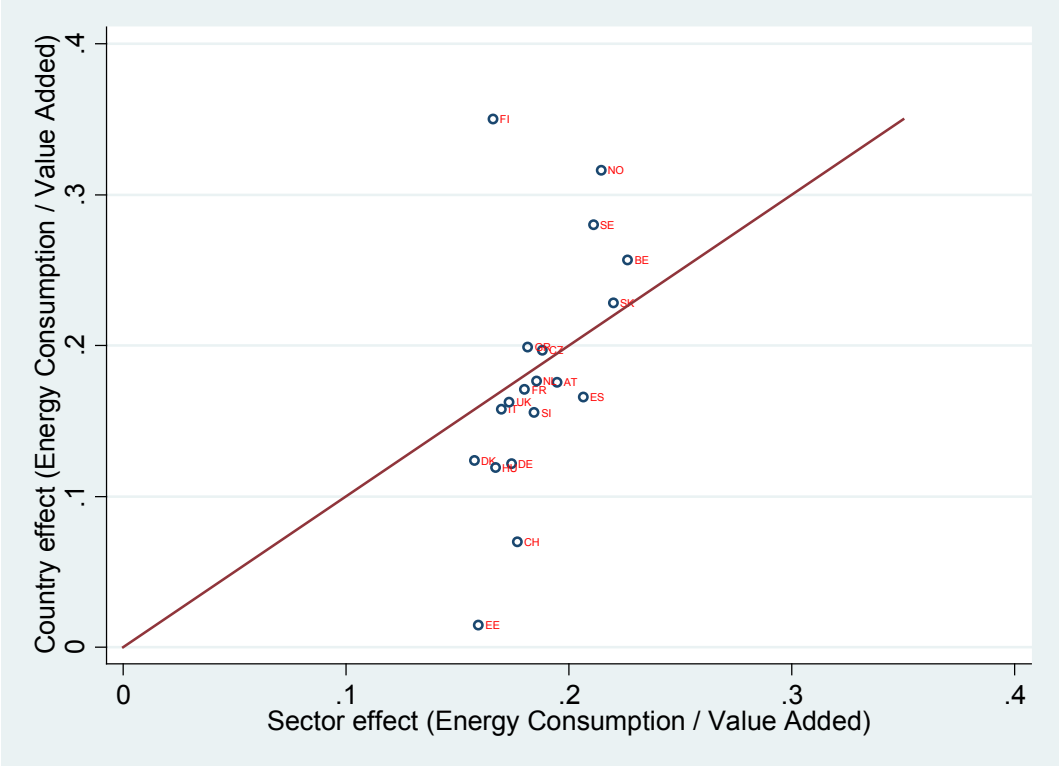
Source: Eurostat, OECD.

In the country annex, we also provide a figure showing these components for individual sectors which in some cases allows for interesting country analysis in terms of revealing country strengths and weaknesses as well as a full table of all the information by country. E.g., in Germany sector 34 – cars and vehicles – shows a strong country effect, as does sector 24 (pharma) and 35 (among others, aircraft and spacecraft) in the UK, 72 (software) in the US and 20-22 (wood and others) in Finland, pointing to well known strengths of these countries.

Energy intensity

We apply the methodology used for R&D intensity to analyse the influence of structural change on the development of energy intensity measured in tons of oil per 1.000 US dollar in power purchasing parities. Aside from the problems inherent in comparing sectoral value added measures across countries, we face additional difficulties in terms of mapping the energy consumption data with NACE-sectors (see technical appendix). Moreover, there are a limited number of sectors which leads to a compressed sector effect in Figure 22, differences between countries mainly arising from the country effect. This reduces the added value of sectoral analysis, as the outcome is similar to aggregate comparisons of energy intensity which don't share the problem of converting sectoral value added in comparable amounts.

Figure 22: Sectoral decomposition of energy intensity (tons of oil per 1.000 US dollar), 2007



Source: Eurostat, OECD.

Relative labour productivity

As mentioned above, calculation of relative labour productivity growth and relative labour productivity levels involved several significant difficulties. In theory, labour productivity should be measured as real value added per hour worked, converting national value added in internationally comparable amounts. Converting value added at the sectoral level is fraught with difficulties. We experimented with OECD aggregate PPPs and KLEMS sectoral PPPs, both of which feature drawbacks and advantages (see technical appendix for a full

discussion), finally deciding in favour of OECD STAN (not least due to its higher likelihood of regular updates), supplementing STAN data with KLEMS data where countries are missing from the STAN database. We chose not to use working hours from KLEMS as an update of KLEMS is very unlikely, implying that we may not have been able to reproduce the analysis for the coming years, which for a monitoring is inadmissible. Instead, we take employees, which is a poor proxy in countries featuring a high share of part-time employees such as the Netherlands.

To signal the potentially large variation of true values around calculated values, we report only three categories for RLP growth – whether growth is above, on par with or below labour productivity growth in the EU. We report the level results for countries as the position of the country in quintiles of the entire distribution of level values across the countries examined.

At the total economy level, our results for RLP growth are in line with the results for GDP per capita growth (see Figure 1), with country group 1 on par with the EU, group 2 below and group 3 and 4 above the EU, indicating their catching up. However, the sectoral disaggregation adds little information which would be of use in interpreting trends in structural change between and within industries (see Table 20 in the annex). We do find that group 1, which is on average specialised in knowledge-intensive industries features higher relative productivity growth to group 2, in line with results from the literature, e.g. Fagerberg (2000) who finds that in his dataset, countries specialised in knowledge-intensive industries manage higher productivity growth than countries which are not.

Our results for the relative level of labour productivity seem to be plausible for some countries and some sectors (e.g., the US and Germany in highly innovative sectors), but implausible for other countries and sectors (e.g., Estonia in medium innovation sectors and Austria in medium-low innovation sectors). We report Table 19 with the results in the annex, but don't think it helps with interpreting trends in structural change.

Summary

In conclusion, while quality and R&D decomposition indicators provide valuable additional information which helps to qualify the information gained by analysis of industrial structure, both sectoral energy intensity and relative labour productivity suffer from severe data problems, even though conceptually appealing.

5.5. Selected Sectors: a brief description

The identification of selected sectors and their fortunes over time are very helpful for the analysis of a particular country. A full list of the identified sectors is in the country annex. Here, we focus on some general insights which emerge from the observation of strong sectors or industries in individual countries, in particular as regards the drivers of specialisation. The two paragraphs below are taken from Competitiveness Report 1998 of the European Commission – we only had to change few industries and countries.[6] This supports the hypothesis of persistent specialisation due to dynamic advantages over time (increasing returns etc.).

Listing the top 5 industries with the highest shares in value added relative to the EU total reveals some pronounced country specific advantages and particular success stories of industrial locations within the EU (see the country annex for a full list of sectors). For example, in interpreting the patterns, different endowments of natural resources can easily be recognised as the underlying causes of the high share of saw milling, planning and

[6] E.g. the manufacture of ships and boats in the UK and in Denmark, as well as consumer electronics in the Netherlands.

impregnation of wood, pulp and paper in Sweden and Finland, articles of wood and cork in Portugal, fish products in Denmark or Spain, and fruit and vegetable oils in Spain and Greece. In addition, the high relative shares of apparel, luggage, handbags and footwear, tanning and articles of fur, ceramic tiles and cutting of stones and similar products in Portugal, Spain, Italy and Greece indicate comparative advantages with regard to labour costs, among others. On the other hand, specific demand conditions can e.g. account for the specialisation in the manufacture of sports goods in Austria (ski).

Besides these examples, the specialisation patterns observed strongly indicate the existence of location specific pools of technological knowledge and marketing skills, and, accordingly, of cluster dynamics, generated and magnified by the interplay of historical circumstances, entrepreneurial achievements and locational advantages as well as sound public policies. Particular examples may be the high share of food processing and games and toys in Denmark; aircraft and spacecraft in the UK and in France; power generation or typical marketing industries, such as detergents, cleaning agents and perfumes in France; communication technologies in both Sweden and Finland; and various types of electrical and mechanical machinery as well as motor vehicles in Germany.

Overall, of the 115 industries across the countries examined, only 26 (23%) lose in terms of relative value added, indicating a loss of specialisation. Concerning top trade industries, there seems to be more movement – 59 out of 135 industries lose specialisation relative to the EU. This is consistent with the information gained above, pointing to higher volatility in exports compared with value added.

A first glance at the development in the shares of exports in the low price segment for the top five industries identified by their valued added share or their RCA reveals some interesting patterns: there seem to be either very low or very high shares, indicating that successful export strategies are either based on price or on quality advantage.

5.6. Summary: Country groups in comparison across indicators

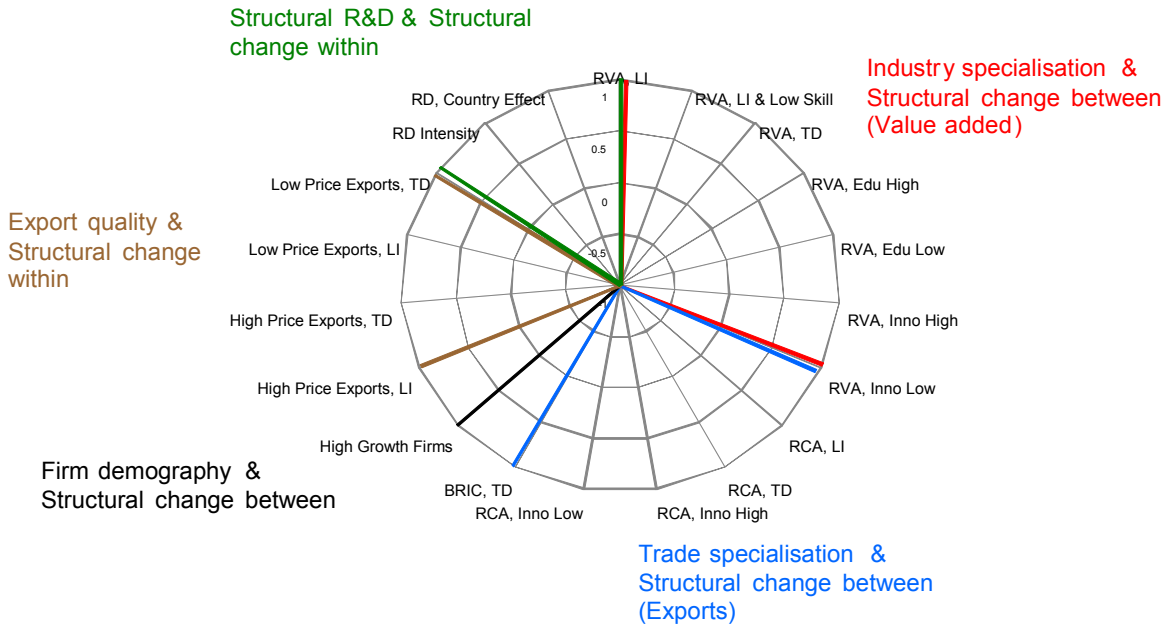
In this subchapter, we employ spider web figures for several country group indicators to provide a summary. We show the level and change of indicators separately, always in standard deviations from the EU average. The same set of indicators will be used for the country profiles to facilitate comparison, but more detail will be provided for the quality indicators. Table 5 presents all the indicators used for the group and country profiles. It already represents a selection of indicators that we think clearly show the salient features of structural change and industrial specialisation and their impact on competitiveness.

Table 5: Indicators for spider figures

Abbreviation	Description	Level (year)	Change (years)
RVA, LI	Value added shares in labour-intensive industries relative to EU 27	2006, 2007 or 2008 depending on data availability	1999/2007
RVA, LI & Low Skill (Country profile only)	Value added shares in labour-intensive and low-skill industries relative to EU 27	2006, 2007 or 2008 depending on data availability	1999/2007
RVA, TD	Value added shares in technology-driven industries relative to EU 27	2006, 2007 or 2008 depending on data availability	1999/2007
RVA, Edu High	Value added shares in high-education sectors relative to EU 27	2006 or 2007 depending on data availability	1999/2007
RVA, Edu Low	Value added shares in low-education sectors relative to EU 27	2006 or 2007 depending on data availability	1999/2007
RVA, Inno High	Value added shares in high-innovation sectors relative to EU 27	2006 or 2007 depending on data availability	1999/2007
RVA, Inno Low	Value added shares in low-innovation sectors relative to EU 27	2006 or 2007 depending on data availability	1999/2007
RCA, LI	Revealed comparative advantage in labour-intensive industries	2010	1999/2010
RCA, TD	Revealed comparative advantage in technology-driven industries	2010	1999/2010
RCA, Inno High	Revealed comparative advantage in high-innovation sectors	2009	-
RCA, Inno Low	Revealed comparative advantage in low-innovation sectors	2009	-
BRIC, TD	Exports to BRIC-countries as a share of total exports by technology-driven industries	2010	1999/2010
High Growth Firms, Inno High	Share of high growth enterprises in the population of active enterprises, measured in employment	2007	-
High Price Exports, LI (country profiles only)	Share of exports in high quality price segments within labour-intensive industries	2009	1999/2009
High Price Exports, TD (country profiles only)	Share of exports in high quality price segments within technology-driven industries	2009	1999/2009
Low Price Exports, LI (country profiles only); inverted	Share of exports in low quality price segments within labour-intensive industries	2009	1999/2009
Low Price Exports, TD; inverted	Share of exports in low quality price segments within technology-driven industries	2009	1999/2009
RD Intensity	Business Enterprise R&D Intensity	2005, 2006 or 2007 depending on data availability	2004/2007
RD, Country Effect	Difference between the structurally adjusted and the actual R&D intensity of the business sector	2005, 2006 or 2007 depending on data availability	2004/2007

Figure 23 shows the position of the indicators by broad indicator area to further facilitate graphical interpretation.

Figure 23: Arrangement of indicators on spider web



Source: WIFO.

The spider webs illustrate the differences and similarities between the country groups. Country groups 1 and 3 are similar in levels of high-INNO and technology-driven trade specialisation. Usually group 3 is closest to group 1 in other structure indicators, with the exception of the R&D country effect, which is particularly low in group 3 (as their sector effect is high) and the share in the low price segment, where group 2 is ahead. Group 2 is similar in levels to group 4, showing pronounced spikes in indicators showing specialisation in labour-intensive, low-INNO, low–EDU industries and sectors. They differ the most as regards the share of high growth firms.

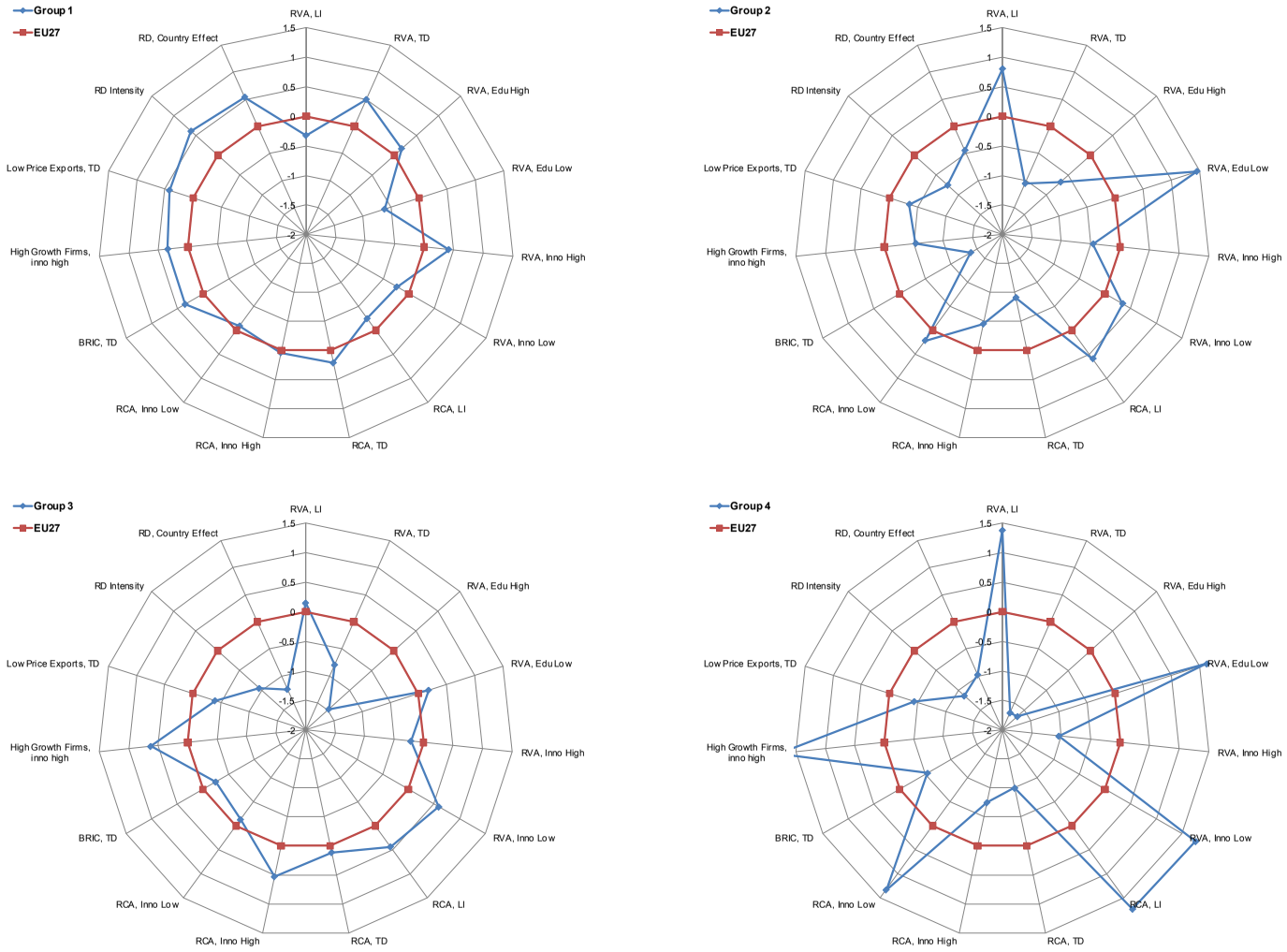
In terms of change, group 1 specialises further in technology-driven industries and high INNO sectors, while group 2 specialises in high EDU sectors. Group 3 and 4 show massive drops in trade specialisation in labour-intensive industries and similarly strong but opposed trends in RVA and RCA of technology-driven industries, with group 4 showing a much stronger rise in high EDU sectors and group 3 in technology-driven industries. Overall, the change profiles of group 1 and 3 are similar in direction, as are group 2 and 4.

Summing up, while group 3 and 4 show visible improvement in structures and in intra-sectoral upgrading, group 2 mostly shows below average levels and change in sectors and industries which require advanced firm capabilities or which signal growth prospects, with the exception of the high EDU sector. Group 1 extends its lead in some indicators such as R&D country effect and relative specialisation in technology-driven industries.

Where international comparison is available, the best countries worldwide (e.g. Japan, Switzerland, US) are usually better than the EU average and slightly above group 1, but below the top EU countries taken individually.

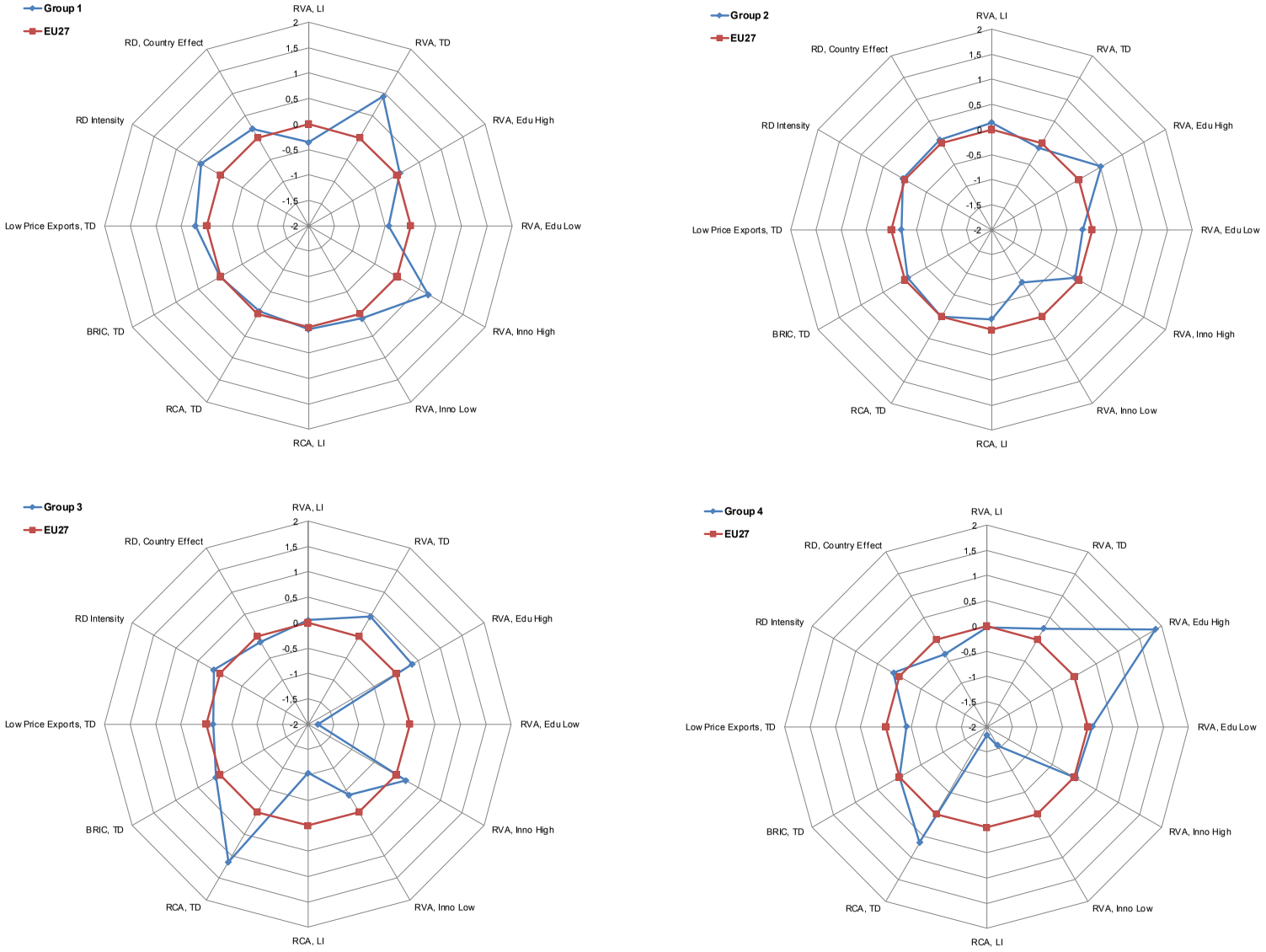
The following chapter will examine econometrically how our indicators are linked with competitiveness as proxied by GDP per capita levels and growth rates.

Figure 24: Indicators of structural change, standard deviation from EU (level)



Source: See above, individual indicators.

Figure 25: Indicators of structural change, standard deviation from EU (change)



Source: See above, individual indicators.

5.7. Annex Tables

Table 6: RVA 2007 and absolute change 2007 against 1999, NACE 3-digit manufacturing

	Mainstream industries		Labour intensive industries		Labour intensive and low skill industries		Capital intensive industries		Marketing driven industries		Technology driven industries		High RQE		Medium RQE		Low RQE	
Country	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change
Austria	1.23	0.14	1.13	0.02	0.77	-0.15	1.12	-0.13	0.83	-0.07	0.68	-0.06	0.88	0.02	1.02	-0.02	1.15	0.01
Belgium	0.86	-0.03	0.76	-0.04	0.76	-0.22	1.71	0.10	0.94	0.01	0.97	-0.03	0.86	-0.04	0.96	0.02	1.26	0.03
Bulgaria	0.95	0.09	1.27	0.05	3.23	0.05	1.49	0.05	1.16	-0.18	0.32	-0.04	0.81	-0.24	0.95	-0.04	1.33	0.40
Cyprus[1])	0.75	.	1.35	.	1.78	.	0.81	.	1.83	.	0.27	.	0.61	.	1.17	.	1.31	.
Czech Republic	1.16	0.06	1.06	-0.11	1.15	-0.45	1.37	0.08	0.79	-0.14	0.70	0.07	1.00	0.05	0.93	0.04	1.09	-0.13
Denmark	1.37	0.11	0.90	-0.08	0.47	-0.13	0.28	-0.01	1.22	-0.16	0.90	0.14	0.94	0.07	1.11	-0.07	0.93	0.02
Estonia[1])	0.96	.	2.20	.	2.30	.	0.51	.	0.96	.	0.37	.	0.66	.	1.12	.	1.32	.
Finland	0.93	0.07	0.88	0.05	0.43	0.02	1.34	-0.54	0.64	-0.06	1.32	0.23	1.07	0.13	0.71	0.03	1.29	-0.26
France	0.92	0.05	0.92	0.03	0.93	0.05	0.69	-0.27	1.13	0.07	1.26	0.05	1.06	0.04	0.97	-0.04	0.94	0.00
Germany	1.08	-0.04	0.84	-0.11	0.70	0.00	1.03	0.06	0.70	-0.12	1.33	0.21	1.22	0.11	0.89	-0.04	0.85	-0.10
Greece	0.69	-0.10	1.18	0.37	1.90	0.16	1.18	-0.73	1.77	0.31	0.32	-0.06	0.68	-0.11	1.22	0.21	1.15	-0.15
Hungary	0.95	0.14	0.78	-0.05	1.03	-0.43	1.44	-0.10	0.84	-0.04	1.13	-0.04	0.93	-0.04	1.09	-0.06	0.98	0.14
Ireland	0.35	-0.03	0.28	0.02	0.19	-0.04	1.87	-0.14	1.39	0.17	1.47	-0.03	0.79	0.05	1.01	-0.02	1.28	-0.05
Italy	1.18	-0.02	1.45	0.04	1.92	-0.03	0.74	-0.13	0.92	0.02	0.62	0.03	0.94	-0.04	1.15	0.05	0.88	0.00
Latvia[1])	0.70	.	2.22	.	2.15	.	0.27	.	1.47	.	0.32	.	0.65	.	1.11	.	1.34	.
Lithuania[1])	0.77	.	1.67	.	2.27	.	1.00	.	1.42	.	0.24	.	0.71	.	1.19	.	1.15	.
Luxembourg[1])	1.52	.	0.72	.	0.49	.	1.63	.	0.88	.	0.30	.	0.40	.	0.97	.	1.90	.
Malta	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Netherlands	0.96	0.04	0.86	-0.02	0.46	-0.08	1.24	0.19	1.38	-0.04	0.63	-0.10	0.82	0.05	1.11	0.06	1.11	-0.17
Poland	1.04	0.21	1.15	0.09	1.24	-0.24	1.17	-0.15	1.21	-0.26	0.49	0.03	0.75	-0.22	1.08	0.08	1.24	0.19
Portugal	0.85	-0.05	1.40	-0.21	3.04	-0.45	1.29	0.25	1.17	0.06	0.45	-0.01	0.84	-0.12	1.15	0.17	1.03	-0.06
Romania	0.78	-0.03	1.57	-0.02	2.66	-0.60	1.35	0.02	1.18	-0.04	0.32	0.04	0.94	-0.15	0.97	0.14	1.14	0.02
Slovakia	1.19	0.15	0.92	0.03	1.39	-0.13	1.70	-0.16	0.64	-0.28	0.71	0.11	0.68	-0.23	0.93	0.08	1.55	0.20
Slovenia	1.17	0.05	1.32	-0.08	1.69	-0.44	0.68	0.07	0.83	-0.19	0.88	0.15	0.87	0.02	1.01	0.05	1.17	-0.10
Spain	0.92	-0.01	1.19	-0.03	1.45	-0.17	1.21	0.04	1.22	0.06	0.56	-0.07	0.79	-0.10	1.11	0.09	1.15	0.02
Sweden	0.93	-0.01	0.91	0.11	0.29	0.05	1.18	-0.01	0.67	-0.02	1.38	-0.07	1.15	-0.04	0.72	0.02	1.18	0.01
United Kingdom	0.87	-0.02	0.88	-0.04	0.68	-0.19	0.74	-0.01	1.33	0.10	1.12	0.00	0.94	-0.03	1.08	-0.01	0.98	0.05
EU 25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
USA[2])	0.79	.	0.60	.	0.54	.	1.15	.	1.23	.	1.29	.	0.94	.	1.01	.	1.07	.
Korea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Japan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Switzerland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Group 1	0.98	0.00	0.86	-0.04	0.68	-0.05	0.98	-0.04	0.97	-0.02	1.20	0.09	1.07	0.05	0.95	-0.02	0.97	-0.04
Group 2	1.06	-0.02	1.35	0.02	1.81	-0.09	0.95	-0.08	1.06	0.05	0.58	-0.01	0.87	-0.07	1.14	0.08	1.00	-0.01
Group 3	1.07	0.15	1.06	0.01	1.22	-0.32	1.27	-0.08	0.99	-0.19	0.68	0.04	0.84	-0.11	1.03	0.05	1.18	0.09
Group 4	0.82	0.00	1.60	0.00	2.68	-0.43	1.26	0.03	1.27	-0.08	0.33	0.02	0.85	-0.18	1.01	0.09	1.20	0.12

Group 1: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Netherlands, Sweden, United Kingdom. - Group 2: Cyprus, Greece, Italy, Luxembourg, Portugal, Spain. - Group 3: Czech Republic, Hungary, Poland, Slovakia, Slovenia. – Group 4: Bulgaria, Estonia, Latvia, Lithuania, Romania. - 1) 2006. - 2) 2008.

Source: Eurostat (SBS).

Table 7: RVA 2007 and absolute change 2007 against 1999, NACE 2-digit manufacturing and services

	INNO										EDU									
	High		Med-high		Med		Med-low		Low		High		Med-high		Med		Med-low		Low	
Country	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change
Austria	1.05	0.10	0.96	-0.03	0.94	0.09	0.92	-0.15	1.09	-0.12	0.72	0.13	0.87	-0.02	1.08	0.14	1.02	-0.20	1.11	-0.15
Belgium	0.70	-0.02	1.37	-0.07	1.01	0.15	1.04	-0.16	1.13	-0.16	1.01	0.18	1.47	0.12	0.96	0.03	0.93	-0.15	0.96	-0.09
Bulgaria	0.63	-0.04	1.21	-0.17	0.55	0.16	1.57	-0.59	1.34	-0.13	0.46	0.22	0.71	-0.52	1.06	0.10	0.93	-0.22	1.38	0.03
Cyprus1)	0.18	0.05	0.58	-0.06	0.63	-0.03	1.03	-0.05	1.09	-0.14	0.50	0.11	0.35	-0.16	0.92	0.11	1.08	0.00	1.56	-0.18
Czech Republic	1.14	0.12	1.38	-0.16	0.86	0.08	1.37	-0.08	1.00	-0.07	0.66	0.15	0.71	-0.15	1.14	0.10	1.10	0.13	1.04	-0.23
Denmark	1.08	0.13	0.67	-0.07	0.86	0.01	0.89	-0.27	1.26	-0.25	0.88	0.10	0.82	-0.02	1.10	0.09	1.14	-0.13	0.91	-0.11
Estonia1)	0.57	0.18	0.74	-0.14	0.93	0.16	1.07	-0.47	1.32	-0.67	0.61	0.17	0.54	0.21	1.03	-0.09	1.04	-0.28	1.30	0.14
Finland	1.89	0.25	0.84	-0.02	0.95	-0.19	0.96	-0.06	0.91	-0.14	0.73	0.10	2.06	0.29	0.93	-0.06	1.01	-0.05	0.99	0.02
France	0.86	-0.07	0.97	-0.17	1.13	0.18	0.92	-0.25	0.96	-0.09	1.18	0.21	1.11	-0.12	0.90	0.01	1.09	-0.05	0.94	-0.10
Germany	1.45	0.32	1.26	0.31	0.94	-0.11	0.94	0.11	0.88	0.21	0.88	-0.17	1.25	0.42	1.20	-0.03	0.90	0.14	0.79	-0.01
Greece	0.35	0.24	0.87	0.25	0.81	0.18	1.25	0.33	1.49	-0.29	0.77	0.10	0.65	0.26	0.94	0.06	1.39	-0.80	1.12	0.20
Hungary	1.23	0.01	1.45	-0.37	0.68	0.18	1.24	-0.50	1.14	0.01	0.67	0.18	1.42	-0.20	1.20	0.09	1.00	0.02	0.83	-0.13
Ireland	1.22	-0.33	1.23	-0.48	0.73	0.12	1.49	-0.22	0.87	0.25	0.89	-0.03	3.09	-0.61	0.79	0.11	0.77	0.08	0.92	0.06
Italy	1.07	-0.02	1.02	-0.09	1.04	0.06	0.87	-0.11	1.07	-0.14	0.85	0.06	0.82	-0.04	0.91	0.04	1.04	-0.10	1.25	-0.03
Latvia1)	0.33	0.06	0.58	-0.14	0.73	0.07	1.15	-0.46	1.53	-0.45	0.50	0.09	0.37	0.14	1.07	-0.08	1.35	0.10	1.21	-0.01
Lithuania1)	0.33	-0.06	0.75	-0.26	0.63	0.15	1.36	-0.76	1.51	-0.01	0.43	0.08	0.68	-0.10	0.94	-0.04	1.53	0.17	1.26	-0.03
Luxembourg1)	0.74	0.09	1.34	-0.07	1.38	0.37	0.47	-0.18	0.81	-0.35	1.56	0.58	0.58	-0.19	0.72	-0.08	1.05	-0.09	1.10	-0.19
Malta 2)	0.73	-0.16	1.88	0.52	0.58	0.00	0.74	-0.43	1.27	-0.12	0.65	0.20	2.04	0.38	0.71	-0.03	1.77	-0.15	1.03	-0.12
Netherlands	0.81	-0.01	0.79	0.05	1.07	0.06	1.00	-0.11	1.32	-0.10	1.15	0.03	1.00	0.07	1.02	0.04	0.95	-0.04	0.89	-0.09
Poland	0.65	-0.04	1.19	-0.06	0.75	0.07	1.56	-0.26	1.18	-0.11	0.49	-0.06	0.77	-0.27	1.14	0.18	1.20	0.20	1.10	-0.21
Portugal	0.51	0.02	0.88	-0.20	0.90	0.03	1.15	-0.03	1.25	-0.03	0.71	0.06	0.72	0.08	0.96	0.05	1.05	0.09	1.29	-0.18
Romania	0.66	0.01	1.22	-0.19	0.64	0.20	1.35	-0.55	1.32	-0.35	0.56	0.33	0.65	-0.23	1.01	-0.01	1.06	-0.18	1.34	0.00
Slovakia	1.12	0.26	1.46	-0.11	0.66	0.18	1.81	-1.09	1.15	0.11	0.59	0.24	0.71	-0.21	1.32	-0.06	1.00	0.28	0.91	-0.09
Slovenia	1.06	0.02	1.22	0.13	0.92	-0.10	0.96	-0.09	1.06	-0.20	0.64	-0.03	1.10	0.05	0.95	0.17	1.12	-0.10	1.22	-0.18
Spain	0.51	-0.03	0.86	-0.12	0.83	0.01	0.91	-0.18	0.99	-0.15	0.74	0.07	0.65	-0.08	0.90	0.03	1.02	-0.14	1.39	0.00
Sweden	1.33	-0.01	0.96	-0.10	0.99	0.00	0.85	-0.06	0.96	-0.05	0.95	0.04	1.22	0.04	1.12	-0.01	0.89	0.03	0.86	-0.01
United Kingdom	0.94	-0.09	0.77	-0.14	1.20	0.07	0.95	-0.06	0.92	-0.12	1.46	0.11	0.88	-0.22	0.89	0.02	0.96	-0.07	0.90	-0.04
EU 25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
USA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Korea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Japan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Switzerland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Group 1	1.17	0.10	1.05	0.04	1.03	0.01	0.96	-0.05	0.95	0.02	1.05	0.01	1.21	0.10	1.04	0.01	0.96	0.02	0.88	-0.04
Group 2	0.82	-0.01	0.96	-0.10	0.96	0.05	0.91	-0.12	1.07	-0.15	0.81	0.07	0.74	-0.03	0.91	0.03	1.05	-0.14	1.29	-0.02
Group 3	0.92	0.03	1.30	-0.13	0.77	0.09	1.44	-0.31	1.12	-0.07	0.58	0.05	0.88	-0.21	1.15	0.13	1.12	0.14	1.04	-0.19
Group 4	0.59	0.01	1.10	-0.19	0.65	0.18	1.37	-0.57	1.36	-0.29	0.52	0.26	0.64	-0.22	1.02	0.00	1.10	-0.14	1.33	0.01

Group 1: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Netherlands, Sweden, United Kingdom. - Group 2: Cyprus, Greece, Italy, Luxembourg, Portugal, Spain. - Group 3: Czech Republic, Hungary, Malta, Poland, Slovakia, Slovenia. - Group 4: Bulgaria, Estonia, Latvia, Lithuania, Romania. - 1) 2006. - 2) EUKLEMS.

Source: Eurostat (SBS).

Table 8: Value added (VA) share, 2007, absolute change 2007 against 1999, NACE 2-digit manufacturing and services

	Inno type										Edu type									
	High		Med-high		Med		Med-low		Low		High		Med-high		Med		Med-low		Low	
Country	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change
Austria	8.22	0.11	11.89	0.30	19.31	0.99	8.12	-1.80	15.00	0.21	14.87	1.66	6.61	-0.75	38.43	2.05	11.19	-2.37	28.90	-0.60
Belgium	5.32	-0.20	14.58	-1.66	22.86	0.99	8.09	-1.72	18.26	1.47	21.59	1.95	9.08	-0.49	38.64	-0.51	10.45	-0.18	20.25	-0.77
Bulgaria																				
Cyprus	0.50	-0.09	14.06	0.19	15.12	1.26	5.47	-2.67	14.11	-1.06	7.71	1.17	12.46	1.89	33.13	1.42	15.64	-1.08	31.07	-3.40
Czech Republic	10.36	1.28	17.88	1.20	18.37	1.53	10.06	-1.50	18.75	-0.23	13.49	1.44	5.64	-0.09	40.01	0.88	14.54	1.27	26.32	-3.50
Denmark	9.65	1.14	8.82	-1.51	19.84	1.71	9.30	-1.66	18.14	-0.63	18.39	3.15	6.89	-0.51	38.99	-2.65	14.07	0.49	21.66	-0.49
Estonia	5.22	0.93	9.60	-0.78	19.18	1.94	8.15	-2.32	20.42	-3.31	13.67	1.46	4.18	0.05	40.71	-2.62	13.33	-1.87	28.10	2.98
Finland	15.06	1.10	11.23	-0.21	18.58	-1.00	7.45	-0.83	16.14	-0.46	12.84	1.48	12.04	0.26	41.14	-2.15	11.70	-0.69	22.28	1.09
France	8.33	-1.38	9.34	-2.29	21.34	0.48	7.05	-1.04	13.21	0.19	22.30	1.06	7.22	-0.59	38.99	0.49	10.52	-0.65	20.97	-0.30
Germany	12.09	1.37	15.16	1.02	20.97	-0.40	7.33	-1.11	11.63	0.19	18.68	0.19	8.37	0.57	45.28	2.35	9.53	-0.74	18.15	-2.36
Greece	2.08	0.73	10.25	-0.32	12.63	-0.12	6.93	-1.00	15.64	0.17	10.77	0.74	5.27	0.67	32.34	-2.06	16.76	-0.30	34.86	0.96
Hungary	11.04	2.27	17.88	-0.79	17.82	2.80	8.90	-2.75	15.00	-0.18	17.69	4.07	9.37	-0.07	40.42	0.32	13.10	-0.85	19.41	-3.46
Ireland	15.37	-4.89	13.85	-3.79	14.60	4.24	19.60	-0.85	9.46	1.93	20.30	1.77	21.16	-0.90	25.52	0.80	6.20	-1.20	26.82	-0.48
Italy	8.78	0.14	10.72	-1.55	19.21	0.07	6.85	0.02	16.39	-0.64	15.90	0.51	6.29	0.43	39.23	1.49	11.83	-2.32	26.75	-0.12
Latvia	1.35	0.01	20.48	1.55	15.13	1.22	6.97	-6.52	22.69	-2.24	12.64	1.96	9.15	1.76	33.83	-0.88	18.07	-3.09	26.31	0.26
Lithuania	2.09	-0.83	16.23	3.26	11.31	2.63	11.24	-6.82	22.44	1.85	6.70	2.43	7.70	1.05	30.33	-4.88	25.41	2.92	29.87	-1.52
Luxembourg	1.44	0.00	20.33	0.63	37.78	3.24	2.69	-1.16	11.62	-0.37	13.04	3.53	33.68	3.31	24.58	-2.42	10.93	-1.80	17.76	-2.62
Malta	6.60	-0.99	23.58	5.76	12.20	0.44	6.07	-4.16	17.06	-2.39	12.50	4.56	16.24	3.05	27.77	-1.80	19.92	-2.54	23.57	-3.26
Netherlands	6.80	0.12	10.58	0.32	23.07	0.30	10.63	0.21	18.49	0.22	22.58	1.75	9.68	-0.17	37.75	1.47	10.24	-2.11	19.75	-0.94
Poland 1)	5.51	-0.26	13.35	1.82	16.85	1.01	11.65	0.85	17.19	-1.67	13.02	0.66	5.72	0.31	36.03	1.18	18.31	0.54	26.92	-2.69
Portugal	4.22	-0.36	11.80	-1.37	20.24	1.00	10.42	0.90	15.20	-1.08	17.48	2.06	5.27	0.63	34.39	-0.70	10.71	0.78	32.15	-2.76
Romania																				
Slovakia	8.02	2.14	15.37	-1.96	16.54	4.20	13.11	0.10	16.69	-6.10	11.12	2.23	7.17	1.01	37.75	-3.60	15.66	-2.15	28.30	2.51
Slovenia 1)	9.33	0.29	15.55	1.08	22.41	1.65	8.80	-1.64	14.93	-0.14	17.63	3.23	8.06	0.00	34.91	0.55	13.65	-0.02	25.75	-3.75
Spain	4.80	-0.27	11.05	-3.34	17.59	1.09	7.24	-1.27	12.60	-1.18	14.73	1.87	4.99	-0.79	31.97	-1.45	11.15	-2.09	37.15	2.45
Sweden	13.36	1.10	12.32	-1.38	19.80	-1.10	8.48	-0.51	15.64	0.51	19.04	1.28	8.54	-1.30	41.58	-1.78	10.90	0.03	19.95	1.78
United Kingdom	7.64	-1.58	9.85	-2.95	26.38	5.39	8.15	-1.66	12.27	-1.61	27.24	6.91	7.88	-1.33	31.17	-3.98	11.71	-1.47	22.01	-0.13
EU 25	9.08	0.54	12.52	-0.58	20.88	0.85	8.22	-0.54	13.44	-0.52	19.10	1.62	7.98	0.02	38.84	-0.65	11.25	-0.44	22.83	-0.55
USA	4.06	-1.33	26.86	0.60	17.19	-0.24	5.12	-0.71	10.27	-0.02	15.94	1.35	18.19	0.81	35.33	-0.44	12.28	-0.33	18.26	-1.38
Korea	15.20	2.23	20.49	0.20	15.73	1.48	8.41	-0.52	11.06	-0.96	15.16	1.55	19.35	1.40	28.33	-0.40	11.76	-0.32	25.40	-2.23
Japan 1)	11.08	0.58	13.74	0.40	16.01	1.95	8.95	-1.00	16.54	-0.21	15.92	2.55	9.36	-0.10	41.83	0.92	11.92	-1.29	20.98	-2.07
Switzerland	12.13	0.60	11.50	1.88	24.92	-0.78	8.99	-0.94	15.09	0.81	23.40	-0.01	15.36	2.82	31.63	-0.83	10.55	-0.77	19.06	-1.21
Group 1	9.81	-0.36	11.99	-1.10	21.94	1.40	8.40	-1.14	13.17	-0.07	21.49	2.22	8.75	-0.38	38.65	0.02	10.35	-0.97	20.76	-0.89
Group 2	6.48	0.00	10.99	-2.09	18.39	0.53	7.14	-0.50	14.81	-0.81	15.13	1.15	6.01	0.05	35.62	-0.01	11.87	-1.91	31.38	0.73
Group 3	7.99	1.79	15.38	-1.25	16.79	3.58	12.55	-0.04	16.78	-4.94	11.80	2.08	7.01	0.81	37.74	-2.57	15.79	-1.56	27.65	1.24
Group 4	2.56	-0.20	16.05	1.87	14.17	2.06	9.29	-5.75	22.07	-0.50	10.00	2.07	7.36	1.04	33.64	-3.19	20.58	0.08	28.42	0.00

Group 1: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Netherlands, Sweden, United Kingdom. - Group 2: Cyprus, Greece, Italy, Luxembourg, Portugal, Spain.- Group 3: Czech Republic, Hungary, Malta, Poland, Slovakia, Slovenia. - Group 4: Estonia, Latvia, Lithuania. - 1) 2006.

Source: OECD (STAN), EU KLEMS.

Table 9: RCA 2010 and absolute change 2010 against 1999 and 2007, NACE 3-digit manufacturing

	Mainstream industries			Labour-intensive industries			Capital-intensive industries			Marketing-driven industries			Technology-driven industries			High RQE			Medium RQE			Low RQE		
	2010	Change 99/10	Change 07/10	2010	Change 99/10	Change 07/10	2010	Change 99/10	Change 07/10	2010	Change 99/10	Change 07/10	2010	Change 99/10	Change 07/10	2010	Change 99/10	Change 07/10	2010	Change 99/10	Change 07/10	2010	Change 99/10	Change 07/10
Austria	0.260	-0.005	-0.004	0.397	0.075	0.060	-0.172	-0.144	0.037	0.043	0.112	-0.004	-0.265	0.059	-0.015	-0.036	0.006	-0.037	-0.044	0.022	0.028	0.100	-0.042	0.036
Belgium	-0.367	-0.184	-0.002	-0.186	-0.259	-0.051	0.385	-0.002	0.009	-0.021	-0.073	0.033	-0.070	0.126	-0.022	-0.075	0.007	-0.025	-0.120	0.008	0.072	0.215	-0.040	-0.012
Bulgaria	-0.200	0.204	0.100	0.538	-0.271	-0.110	0.581	-0.075	-0.130	0.091	-0.259	0.266	-1.045	0.665	0.416	-0.540	-0.284	0.006	0.219	0.268	0.037	0.392	-0.010	-0.030
Cyprus	-0.917	-0.868	-0.461	-0.718	-1.065	0.013	-0.432	-0.460	0.358	0.444	-0.261	0.166	0.441	1.126	-0.081	0.195	0.191	-0.161	-0.185	-0.126	0.296	-0.230	-0.286	0.215
Czech Republic	0.174	-0.144	-0.061	0.145	-0.358	-0.062	-0.236	-0.312	-0.005	-0.265	-0.004	0.022	0.064	0.582	0.087	-0.118	0.031	-0.001	0.145	0.198	0.047	0.035	-0.249	-0.049
Denmark	0.283	0.093	0.034	0.400	0.132	0.123	-0.679	0.128	-0.034	0.671	-0.045	0.000	-0.460	-0.054	-0.090	-0.157	0.031	-0.009	0.364	-0.023	0.023	-0.208	0.009	-0.033
Estonia	-0.105	0.398	0.047	1.005	-0.256	0.008	0.107	0.606	0.038	0.004	0.057	-0.006	-0.655	-0.221	-0.002	-0.343	-0.025	-0.020	0.321	0.435	0.064	0.117	-0.386	-0.054
Finland	0.180	0.251	0.170	0.114	-0.006	-0.032	0.620	-0.025	0.168	-1.150	0.039	0.110	-0.670	-0.443	-0.450	-0.403	-0.054	-0.219	-0.227	0.231	0.113	0.578	-0.111	0.127
France	-0.171	-0.001	-0.050	-0.287	0.090	0.028	-0.173	-0.051	-0.058	0.279	0.145	0.017	0.144	-0.043	0.021	0.163	0.021	0.026	-0.105	0.019	0.000	-0.231	-0.049	-0.066
Germany	0.161	0.002	0.037	-0.103	0.056	0.016	-0.198	-0.065	0.002	-0.273	0.055	-0.002	0.118	0.019	-0.025	0.135	-0.008	-0.012	-0.134	0.027	-0.023	-0.134	0.008	0.051
Greece	-0.212	0.284	0.040	0.200	-0.541	-0.094	0.359	-0.086	-0.076	0.617	-0.035	0.096	-0.806	0.513	0.059	-0.431	-0.105	0.029	0.128	0.121	-0.080	0.387	-0.042	0.047
Hungary	-0.104	0.077	0.009	-0.235	-0.355	0.007	-0.431	0.113	0.101	-0.489	-0.265	0.042	0.409	0.109	-0.049	0.031	0.234	-0.046	-0.139	-0.328	-0.057	0.073	-0.045	0.135
Ireland	-1.633	-0.353	-0.046	-1.879	-0.451	-0.135	-0.121	-0.198	-0.188	-0.123	-0.094	-0.168	0.626	0.112	0.067	0.270	0.591	0.337	-0.445	-0.864	-0.555	-0.196	-0.147	-0.195
Italy	0.441	0.015	0.006	0.482	-0.063	0.002	-0.139	0.118	0.042	0.171	0.019	0.026	-0.708	0.015	0.012	-0.002	-0.037	-0.019	0.078	0.048	0.012	-0.080	0.028	0.019
Latvia	-0.261	0.417	0.051	1.090	-0.452	-0.101	-0.152	-0.147	0.038	0.350	0.511	0.026	-0.590	1.140	0.169	-0.320	0.375	-0.024	-0.153	-0.033	-0.036	0.482	-0.263	0.046
Lithuania	-0.331	0.229	-0.006	0.629	-0.556	-0.157	0.515	0.156	0.245	0.212	0.163	-0.084	-0.922	0.292	-0.200	-0.541	-0.283	-0.119	0.619	0.332	0.177	-0.143	-0.213	-0.188
Luxembourg	0.057	-0.218	0.204	-0.780	-0.066	-0.127	0.096	-0.426	-0.148	-0.524	-0.160	0.112	0.177	0.491	-0.022	-0.126	0.376	0.681	-0.026	-0.056	-0.496	0.209	-0.344	-0.100
Malta	-0.615	0.239	0.119	-1.089	-1.020	0.152	-0.732	0.750	1.294	0.095	0.286	-0.132	0.583	-0.027	-0.160	-0.362	0.122	0.029	0.788	-0.065	-0.049	-1.131	0.318	0.162
Netherlands	-0.435	-0.017	-0.014	-0.665	-0.011	0.028	0.256	0.124	0.015	0.212	-0.164	-0.049	0.068	-0.055	-0.024	-0.334	0.051	-0.008	0.374	-0.049	0.037	0.038	0.004	-0.044
Poland	0.054	0.051	-0.054	0.560	-0.445	-0.096	-0.116	-0.135	-0.033	0.203	0.136	0.055	-0.286	0.627	0.172	-0.381	0.080	-0.017	0.212	0.028	0.029	0.273	-0.129	-0.009
Portugal	-0.010	0.180	0.058	0.692	-0.206	-0.034	0.168	0.417	0.194	0.293	0.083	0.021	-0.726	-0.315	-0.253	-0.199	-0.183	-0.004	0.013	0.233	-0.085	0.263	0.037	0.079
Romania	-0.049	0.354	0.025	0.921	-0.413	-0.170	0.068	-0.249	-0.230	-0.284	-0.258	-0.020	-0.403	1.700	0.861	-0.129	0.030	0.167	0.095	0.140	-0.098	0.105	-0.186	-0.103
Slovakia	-0.073	-0.100	0.044	0.196	-0.251	-0.072	-0.075	-0.590	-0.042	-0.421	0.081	0.012	0.154	0.658	0.029	-0.252	-0.041	-0.052	-0.151	-0.042	-0.003	0.425	0.027	0.057
Slovenia	0.243	-0.060	-0.004	0.405	-0.265	-0.036	-0.151	-0.086	0.049	-0.281	0.008	-0.017	-0.133	0.392	0.037	-0.172	0.037	-0.075	-0.036	-0.017	0.048	0.271	-0.059	0.057
Spain	-0.140	0.050	0.039	0.046	0.144	0.078	0.162	-0.025	0.008	0.247	0.016	0.031	-0.168	-0.105	-0.085	-0.041	-0.087	-0.042	-0.068	0.076	0.041	0.128	0.070	0.033
Sweden	0.033	0.069	0.021	0.000	0.072	-0.008	0.293	-0.007	0.042	-0.609	0.275	0.082	-0.084	-0.165	-0.055	-0.080	-0.105	-0.054	-0.090	0.337	0.083	0.199	-0.095	0.018
United Kingdom	-0.226	-0.094	-0.098	-0.329	0.020	0.010	0.005	0.120	-0.029	-0.113	-0.033	-0.069	0.218	-0.011	0.065	0.121	0.109	0.064	-0.043	-0.164	-0.042	-0.201	-0.015	-0.096
Group 1	-0.068	-0.004	0.001	-0.194	0.021	0.009	0.016	0.002	-0.004	-0.032	0.005	-0.010	0.087	-0.015	-0.006	0.039	0.027	0.008	-0.027	-0.027	-0.004	-0.043	-0.020	-0.012
Group 2	0.248	0.007	0.013	0.358	-0.074	0.008	0.002	0.078	0.033	0.203	0.019	0.032	-0.485	0.000	-0.037	-0.037	-0.054	-0.012	0.030	0.059	-0.008	0.032	0.034	0.027
Group 3	0.058	-0.037	-0.032	0.272	-0.339	-0.064	-0.199	-0.188	0.001	-0.135	0.038	0.042	0.047	0.365	0.050	-0.187	0.067	-0.032	0.073	-0.005	0.020	0.200	-0.099	0.023
Group 4	-0.159	0.324	0.041	0.810	-0.349	-0.119	0.240	0.026	-0.057	-0.010	-0.057	0.016	-0.550	0.384	0.313	-0.294	-0.028	0.061	0.258	0.138	0.010	0.138	-0.135	-0.074

Group 1: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Netherlands, Sweden, United Kingdom. - Group 2: Greece, Italy, Luxembourg, Portugal, Spain. - Group 3: Czech Republic, Hungary, Poland, Slovakia, Slovenia. - Group 4: Bulgaria, Cyprus, Estonia, Latvia, Lithuania, Malta, Romania.

Source: Eurostat (Comext). – Including intra-EU exports.

Table 10: Share of exports to BRIC in total exports as percent 2010 and index 2010 (1999=100, 2007=100), NACE 3-digit manufacturing

	Mainstream industries			Labour-intensive industries			Capital-intensive industries			Marketing-driven industries			Technology-driven industries			High RQE			Medium RQE			Low RQE			Total industry		
	2010	1999=100	2007=100	2010	1999=100	2007=100	2010	1999=100	2007=100	2010	1999=100	2007=100	2010	1999=100	2007=100	2010	1999=100	2007=100	2010	1999=100	2007=100	2010	1999=100	2007=100	2010	1999=100	2007=100
Austria	2.26	249.1	116.4	0.85	385.9	153.5	0.69	435.1	133.3	0.45	263.6	102.2	1.91	310.3	145.1	3.58	273.4	129.1	1.37	361.2	126.0	1.20	315.6	133.0	6.16	297.2	129.1
Belgium	0.83	308.4	131.7	0.42	358.1	118.9	1.60	347.4	155.4	0.24	157.8	134.4	1.16	366.4	164.1	2.06	370.6	145.9	0.73	284.4	144.8	1.46	290.0	148.7	4.25	322.9	146.7
Bulgaria	1.02	88.0	108.6	0.33	94.0	112.8	1.64	366.4	138.6	0.41	21.4	60.9	1.72	96.6	261.8	2.46	93.1	149.4	0.82	45.2	101.9	1.84	154.5	142.7	5.12	90.8	136.9
Cyprus	0.73	59.5	263.2	0.23	140.8	106.9	1.74	1,411.3	174.8	0.21	77.4	79.8	2.33	546.0	180.7	3.17	277.4	180.7	0.13	52.9	57.9	1.94	237.8	183.5	5.23	237.4	172.5
Czech Republic	1.53	221.7	111.2	0.57	230.5	118.1	0.85	261.1	205.9	0.33	98.8	136.1	1.37	324.7	121.4	2.34	217.3	127.4	1.40	256.7	130.2	0.91	230.0	124.4	4.65	230.4	127.6
Denmark	2.09	321.7	129.5	0.28	261.0	90.9	0.42	362.9	91.3	1.23	230.4	117.4	1.23	364.0	167.7	2.34	289.8	136.6	1.90	292.7	124.3	1.03	349.4	109.6	5.27	300.9	126.1
Estonia	4.08	1,118.9	127.3	1.54	407.6	124.8	2.52	156.0	108.5	2.85	358.6	101.1	1.67	390.0	123.2	6.71	294.8	106.9	3.25	415.7	168.8	2.70	514.9	98.9	12.66	353.4	115.8
Finland	6.68	280.3	136.7	0.90	173.9	98.2	4.16	306.9	140.9	1.05	136.9	123.3	4.00	150.7	70.0	8.11	253.1	97.5	2.58	168.2	106.3	6.11	207.5	133.3	16.80	218.7	109.6
France	1.21	219.9	111.8	0.43	229.1	110.2	0.94	330.3	133.5	0.75	276.0	134.8	3.01	244.7	111.6	4.18	276.4	113.0	1.15	219.7	126.1	1.01	206.6	123.1	6.33	251.2	116.8
Germany	3.63	299.1	130.2	0.88	233.0	124.1	1.77	390.8	160.4	0.55	188.5	129.2	3.94	384.2	154.5	6.82	353.7	148.5	2.01	270.7	129.6	1.94	280.7	135.4	10.77	320.4	142.2
Greece	0.44	258.1	72.1	1.06	90.7	99.6	0.87	131.9	127.8	0.57	159.1	115.4	0.26	42.7	206.2	0.48	56.5	81.4	1.41	109.5	104.4	1.30	158.1	127.0	3.20	107.7	107.6
Hungary	1.06	354.7	151.5	0.48	722.8	296.9	0.52	341.7	143.7	0.24	46.0	78.6	3.93	585.0	114.3	3.98	478.4	124.0	1.02	254.4	104.7	1.24	260.6	157.1	6.24	365.1	125.5
Ireland	0.12	192.9	126.3	0.03	147.5	80.5	0.30	235.4	123.2	0.24	84.4	127.0	1.98	417.1	117.2	0.78	240.3	156.0	1.54	329.2	104.7	0.35	204.1	124.4	2.67	276.9	118.5
Italy	3.27	250.6	121.4	1.32	220.2	104.8	1.00	245.4	132.7	0.74	245.9	112.6	0.88	183.5	128.1	4.31	219.1	121.5	1.67	241.6	123.1	1.21	283.9	107.0	7.20	233.1	119.2
Latvia	5.10	278.4	114.5	2.84	223.8	95.9	2.10	218.5	115.8	5.87	284.3	175.5	2.92	273.7	137.1	10.06	403.1	128.3	4.12	129.6	121.0	4.64	306.4	134.7	18.82	261.8	128.1
Lithuania	5.11	397.6	123.2	2.59	351.6	125.5	1.77	160.0	160.7	3.62	195.4	122.0	2.17	197.2	53.9	7.37	261.9	98.9	4.55	200.9	124.9	3.34	333.6	104.0	15.26	251.0	106.7
Luxembourg	1.15	127.0	108.6	0.04	231.3	38.4	0.80	233.1	88.6	0.06	198.4	285.4	0.68	1,741.8	175.9	1.22	238.7	135.6	0.58	133.2	98.9	0.92	238.4	94.6	2.73	204.2	110.7
Malta	0.45	1,235.7	236.7	0.06	143.9	96.5	0.23	11,399.6	423.1	0.02	313.9	12.9	3.25	8,227.9	261.1	0.92	1,609.2	249.3	2.79	6,246.2	222.2	0.31	1,183.4	342.6	4.02	3,141.0	234.3
Netherlands	0.93	325.7	111.9	0.11	124.6	78.8	1.15	420.7	128.4	0.50	139.8	130.2	1.41	286.1	97.2	1.56	279.4	107.6	1.31	260.2	112.9	1.23	280.2	112.5	4.10	273.2	110.7
Poland	1.68	191.1	75.5	0.60	165.3	81.6	1.32	206.7	133.0	1.21	98.6	109.7	0.93	246.9	133.1	1.73	220.9	96.6	1.73	119.4	94.1	2.28	181.6	107.2	5.74	164.6	99.7
Portugal	0.44	225.8	158.4	0.30	183.9	143.1	0.37	358.6	169.7	0.74	265.5	135.5	0.31	508.5	104.1	0.60	218.2	141.7	0.53	356.3	99.0	1.02	272.5	175.3	2.15	269.4	139.5
Romania	0.85	518.3	103.6	0.30	69.0	105.4	1.22	281.9	65.1	0.07	50.5	88.0	1.29	663.9	403.9	2.28	485.0	150.7	0.45	243.7	111.7	1.00	141.2	68.5	3.73	273.8	110.5
Slovakia	0.95	245.0	122.8	0.98	357.9	384.6	0.52	190.2	157.5	0.17	88.4	94.1	3.88	2,050.5	224.2	4.88	921.9	245.8	0.62	254.1	139.9	1.01	184.2	119.2	6.51	492.2	198.7
Slovenia	1.57	271.7	72.8	0.63	459.5	108.7	0.45	293.6	170.1	0.34	233.3	91.2	1.67	195.0	96.1	2.27	182.7	90.1	1.28	455.4	90.0	1.11	319.2	95.0	4.66	249.0	91.2
Spain	0.99	183.4	114.7	0.58	144.2	178.1	1.33	379.4	138.3	0.67	187.0	144.4	0.74	137.1	93.7	1.84	159.7	118.1	1.04	209.0	142.2	1.42	264.5	128.4	4.31	196.7	126.7
Sweden	2.32	269.7	114.8	0.37	233.4	142.8	1.96	421.7	141.8	0.19	191.9	140.9	2.51	115.5	123.8	4.03	180.5	118.8	1.07	281.5	138.9	2.25	197.0	135.4	7.35	195.7	126.2
United Kingdom	1.32	222.4	111.6	0.28	188.9	113.1	1.66	416.7	137.9	0.40	201.5	116.6	2.85	377.3	154.2	3.66	354.5	146.8	1.02	198.4	113.8	1.83	333.9	127.5	6.50	310.9	134.9
Group 1	2.16	285.4	123.9	0.53	241.2	118.9	1.47	378.8	145.4	0.52	189.5	126.3	2.77	294.6	133.3	4.35	314.7	134.0	1.47	256.4	124.0	1.64	261.5	129.5	7.45	288.8	130.9
Group 2	2.28	229.4	118.9	0.99	190.8	111.9	1.05	279.0	134.4	0.70	224.9	121.7	0.78	169.5	116.7	3.16	199.7	120.0	1.38	223.9	124.4	1.26	272.8	116.0	5.80	218.0	120.1
Group 3	1.41	233.7	94.8	0.63	273.7	130.8	0.87	250.1	153.7	0.58	97.8	109.5	2.08	427.6	132.6	2.80	313.9	129.7	1.32	187.3	106.6	1.45	217.8	117.4	5.57	246.1	120.2
Group 4	2.29	362.0	118.9	1.03	217.8	115.6	1.57	243.0	98.6	1.49	172.2	120.8	1.74	264.0	133.5	4.25	290.5	120.5	1.87	184.7	128.5	2.01	249.7	101.9	8.13	247.8	116.9
EU 27	2.11	266.9	120.2	0.63	227.7	117.7	1.34	348.2	142.5	0.57	192.1	124.0	2.37	282.9	132.4	4.00	286.9	131.1	1.45	245.5	122.6	1.57	260.7	125.8	7.02	271.4	128.1

Group 1: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Netherlands, Sweden, United Kingdom. - Group 2: Greece, Italy, Luxembourg, Portugal, Spain. - Group 3: Czech Republic, Hungary, Poland, Slovakia, Slovenia. - Group 4: Bulgaria, Cyprus, Estonia, Latvia, Lithuania, Malta, Romania.

Source: Eurostat (Comext). – Including intra-EU exports.

Table 11: RCA 2009 and absolute change 2009 against 2004 and 2007, NACE 2-digit manufacturing and services

	INNO																EDU											
	High			Med-high			Med			Med -low			Low			High			Med-high			Med			Med -low			Low		
	2009	Change 04/09	Change 07/09	2009	Change 04/09	Change 07/09	2009	Change 04/09	Change 07/09	2009	Change 04/09	Change 07/09	2009	Change 04/09	Change 07/09	2009	Change 04/09	Change 07/09	2009	Change 04/09	Change 07/09	2009	Change 04/09	Change 07/09	2009	Change 04/09	Change 07/09	2009	Change 04/09	Change 07/09
Austria	0.007	0.017	0.002	-0.131	-0.048	-0.029	0.203	-0.036	0.003	-0.066	0.098	-0.021	0.199	0.150	0.112	-0.391	0.050	0.052	-0.461	-0.078	0.020	0.129	-0.021	-0.044	0.230	0.085	0.075	0.315	0.063	0.044
Belgium	-0.584	0.003	0.043	0.324	0.007	-0.020	-0.324	-0.087	0.101	0.041	-0.012	-0.003	0.105	0.166	0.030	-0.398	0.013	0.370	0.319	0.077	-0.019	-0.267	-0.123	-0.041	0.107	-0.005	-0.054	-0.067	-0.033	-0.061
Bulgaria	-0.457	0.423	0.153	0.120	0.077	-0.080	-0.310	0.003	0.064	0.158	0.307	0.325	0.778	-0.606	-0.088	-1.126	-0.032	0.162	-0.254	0.290	-0.111	-0.742	0.333	0.151	-0.183	-0.364	-0.007	0.770	-0.093	0.008
Cyprus	-1.251	-0.482	-0.362	-1.681	-0.295	-0.267	1.133	0.176	0.074	-0.761	-0.351	-0.302	1.401	-0.090	0.054	1.014	0.367	0.260	-0.754	-0.265	-0.430	-2.160	-0.185	-0.413	0.873	0.139	0.228	0.048	-0.383	-0.220
Czech Republic	0.254	0.054	-0.044	-0.054	-0.036	0.012	-0.034	-0.037	0.049	-0.544	0.057	0.027	-0.307	0.107	0.115	-0.116	0.305	0.076	-0.488	-0.022	0.034	0.388	0.087	0.046	0.238	0.023	0.037	-0.047	-0.157	-0.053
Denmark 1)	-0.127	-0.015	0.019	-0.601	0.015	0.065	-0.223	0.040	0.025	0.545	-0.168	-0.068	1.355	-0.009	-0.122	-0.332	0.225	0.193	-0.315	-0.101	-0.040	-0.407	0.068	0.072	1.143	-0.047	-0.116	0.063	-0.010	0.047
Estonia	-0.323	-0.206	-0.035	-0.224	0.314	0.029	0.300	-0.070	-0.034	-0.003	0.061	-0.094	0.891	-0.235	0.036	-0.565	0.532	0.077	-0.289	-0.091	-0.023	-0.245	0.448	0.036	0.713	-0.113	0.058	0.317	-0.160	-0.032
Finland	0.454	.	0.093	-0.404	.	-0.101	0.356	.	-0.038	-1.182	.	-0.016	-0.826	.	0.080	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
France	-0.205	.	-0.033	0.188	.	0.023	-0.309	.	0.040	0.187	.	-0.050	-0.078	.	-0.035	-0.665	.	0.006	0.214	.	0.022	-0.113	.	-0.031	-0.189	.	-0.068	0.137	.	0.011
Germany	0.146	-0.032	-0.021	0.075	-0.002	0.003	-0.188	0.071	0.050	-0.292	0.070	0.019	-0.458	0.109	0.062	-0.300	0.053	0.086	-0.040	-0.003	0.009	0.352	-0.016	-0.005	-0.105	0.057	0.050	-0.206	0.063	0.011
Greece	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hungary 1)	0.564	0.093	0.028	-0.222	-0.059	-0.054	-0.476	-0.001	0.078	-0.495	-0.080	0.001	-0.526	-0.171	-0.035	-0.299	-0.145	-0.162	0.187	0.106	0.081	0.214	0.020	-0.063	-0.190	0.020	0.055	-0.307	-0.104	0.068
Ireland	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Italy	0.062	0.043	0.012	-0.073	0.030	0.001	-0.064	-0.097	-0.060	-0.082	0.070	0.097	0.351	-0.128	-0.007	-0.928	-0.088	-0.109	-0.374	0.025	-0.039	0.206	0.101	0.065	0.038	-0.177	-0.043	0.364	0.012	0.047
Latvia	-0.611	0.615	0.201	-0.390	0.073	-0.026	0.458	-0.299	-0.107	0.285	0.252	-0.062	1.075	-0.179	0.023	-0.336	0.239	0.045	-0.555	0.222	0.116	-0.561	0.636	0.134	0.851	-0.138	0.030	0.466	-0.210	-0.097
Lithuania	-0.872	-0.087	-0.211	0.146	0.053	0.117	-0.216	-0.030	-0.027	0.472	0.283	-0.060	0.774	-0.273	-0.138	-1.808	-0.098	-0.132	0.201	-0.014	0.160	-0.590	0.228	-0.132	0.782	-0.020	-0.070	0.200	-0.074	-0.052
Luxembourg	-0.458	-0.136	0.196	-0.987	-0.172	0.014	1.241	0.036	-0.093	-0.292	-0.026	0.111	-1.140	0.426	0.226	1.502	-0.075	-0.157	-0.675	0.197	0.295	-1.094	0.198	0.288	-0.841	0.013	0.041	-0.634	-0.376	-0.086
Malta	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Netherlands	0.253	0.022	0.016	-0.165	0.026	-0.054	-0.273	-0.131	0.048	0.390	-0.049	-0.009	-0.201	0.084	0.031	0.451	-0.144	0.012	0.205	-0.024	-0.102	-0.604	0.006	-0.022	-0.153	0.180	0.107	-0.083	0.010	0.022
Poland	-0.181	0.260	0.063	0.001	-0.078	-0.011	0.119	-0.132	-0.045	0.183	0.120	-0.020	0.094	-0.080	-0.013	-0.614	0.831	0.473	-0.445	0.011	0.021	0.187	0.075	0.057	0.514	-0.053	-0.034	0.206	-0.115	-0.068
Portugal 1)	-0.561	-0.075	-0.181	-0.095	-0.083	-0.005	0.365	0.140	0.076	0.175	0.134	0.053	0.655	-0.058	0.041	-0.740	0.016	0.037	-0.401	-0.033	-0.167	-0.249	0.035	0.058	0.122	0.148	0.115	0.595	-0.025	0.041
Romania	-0.025	0.465	0.247	-0.028	0.071	-0.036	-0.068	0.017	-0.091	-0.932	0.621	0.365	0.761	-0.692	-0.190	-0.387	0.870	0.002	-0.296	0.115	0.125	0.156	0.571	0.194	0.318	-0.025	0.099	0.159	-0.488	-0.221
Slovakia 1)	0.253	0.340	0.166	0.033	-0.104	-0.097	-0.282	-0.076	0.004	-0.762	-0.250	-0.037	-0.118	-0.369	-0.006	-1.300	-0.395	-0.034	-0.010	0.416	0.110	0.333	0.034	-0.011	0.054	-0.249	0.032	0.001	-0.178	-0.024
Slovenia	-0.141	-0.054	0.006	0.135	0.120	0.020	0.058	-0.162	-0.011	-0.446	0.346	0.143	-0.079	-0.297	-0.124	-1.143	0.255	0.273	-0.365	0.117	0.125	0.376	0.147	0.057	0.339	-0.302	-0.114	0.128	-0.059	-0.040
Spain	-0.576	.	0.015	0.130	.	-0.027	0.215	.	0.026	0.226	.	-0.003	0.009	.	0.092	-0.104	.	0.056	-0.307	.	-0.071	-0.041	.	0.005	-0.366	.	-0.044	0.398	.	0.046
Sweden	0.234	0.088	0.054	-0.203	-0.083	-0.092	0.278	-0.022	0.055	-0.722	0.076	0.032	-0.172	0.061	0.068	0.180	0.203	0.079	-0.083	-0.040	0.039	0.173	-0.062	-0.029	-0.040	0.004	0.061	-0.200	0.030	-0.057
United Kingdom	-0.168	-0.179	-0.048	-0.132	0.057	0.044	0.504	0.077	-0.052	-0.007	0.010	0.088	-0.343	-0.065	0.017	0.719	-0.075	-0.145	0.101	0.029	0.085	-0.363	-0.058	-0.024	-0.295	-0.073	0.010	-0.358	0.006	-0.021
Group 1 2)	0.014	.	-0.006	0.025	.	-0.001	-0.044	.	0.008	-0.003	.	0.007	-0.100	.	0.016	0.011	.	-0.006	0.076	.	0.002	-0.001	.	-0.015	-0.017	.	0.011	-0.093	.	0.004
Group 2 3)	-0.183	.	-0.001	-0.055	.	-0.009	0.253	.	-0.016	0.030	.	0.061	0.202	.	0.015	-0.091	.	-0.035	-0.373	.	-0.044	0.032	.	0.041	-0.133	.	-0.038	0.341	.	0.040
Group 3 1)	0.179	0.124	0.024	-0.039	-0.035	-0.021	-0.068	-0.074	0.010	-0.240	-0.050	0.010	-0.146	-0.095	0.011	-0.469	0.161	0.106	-0.235	0.137	0.057	0.282	0.033	0.020	0.265	-0.066	0.001	0.024	-0.117	-0.035
Group 4 4)	-0.324	0.273	0.128	-0.071	0.077	-0.025	0.116	-0.008	-0.013	-0.151	0.260	0.047	0.865	-0.471	-0.090	-0.364	0.423	0.121	-0.239	0.066	0.035	-0.253	0.495	0.123	0.495	-0.071	0.052	0.337	-0.270	-0.115

Group 1: Austria, Belgium, Denmark, Finland, France, German, Ireland, Netherlands, Sweden, United Kingdom. - Group 2: Greece, Italy, Luxembourg, Portugal, Spain. - Group 3: Czech Republic, Hungary, Poland, Slovakia, Slovenia. - Group 4: Bulgaria, Cyprus, Estonia, Latvia, Lithuania, Malta, Romania. - 1) Changes against 2005. - 2) Innovation without Ireland; Education without Finland and Ireland. - 3) Without Greece. - 4) Without Malta.

Source: Eurostat (Comext). – Including intra-EU exports.

Table 12: Business demography: Relative business fluctuation (RBF) 2006 and average 2006 and 2007

	INNO										EDU											
	High		Med-high		Med		Med-low		Low		High		Med-high		Med		Med-low		Low		Total	
		∅		∅		∅		∅		∅		∅		∅		∅		∅		∅		∅
Country	2006	2006/2007	2006	2006/2007	2006	2006/2007	2006	2006/2007	2006	2006/2007	2006	2006/2007	2006	2006/2007	2006	2006/2007	2006	2006/2007	2006	2006/2007	2006	2006/2007
Austria	0.81	0.89	0.77	0.90	0.80	0.90	0.63	0.70	0.89	1.00	0.82	0.93	0.84	1.03	0.76	0.83	0.85	0.93	0.76	0.84	0.80	0.89
Belgium1)	0.67	0.67	0.64	0.64	0.63	0.63	0.57	0.57	0.66	0.66	0.63	0.63	0.85	0.85	0.70	0.70	0.57	0.57	0.62	0.62	0.64	0.64
Bulgaria1)	1.03	1.03	1.09	1.09	1.14	1.14	1.31	1.31	1.06	1.06	1.11	1.11	0.83	0.83	1.20	1.20	1.19	1.19	1.26	1.26	1.20	1.20
Cyprus1)	0.18	0.18	0.15	0.15	0.15	0.15	0.23	0.23	0.13	0.13	0.18	0.18	0.06	0.06	0.20	0.20	0.29	0.29	0.35	0.35	0.29	0.29
Czech Republic1)	1.01	1.01	1.21	1.21	1.11	1.11	1.32	1.32	1.35	1.35	1.00	1.00	0.95	0.95	1.65	1.65	1.30	1.30	1.13	1.13	1.21	1.21
Denmark1)	1.45	1.45	1.17	1.17	1.46	1.46	0.72	0.72	1.14	1.14	1.51	1.51	1.36	1.36	1.17	1.17	1.22	1.22	1.22	1.22	1.28	1.28
Estonia1)	1.01	1.01	0.96	0.96	1.09	1.09	0.81	0.81	1.78	1.78	1.12	1.12	0.92	0.92	1.69	1.69	0.80	0.80	1.17	1.17	1.28	1.28
Finland1)	0.90	0.90	0.76	0.76	0.89	0.89	0.64	0.64	0.72	0.72	0.93	0.93	1.00	1.00	0.89	0.89	1.03	1.03	0.85	0.85	0.92	0.92
France2)	1.29	1.29	1.30	1.30	1.14	1.14	1.34	1.34	1.27	1.27	1.14	1.14	1.09	1.09	1.13	1.13	1.37	1.37	1.21	1.21	1.22	1.22
Germany1)	1.05	1.05	1.06	1.06	1.08	1.08	0.99	0.99	1.09	1.09	1.13	1.13	1.08	1.08	0.99	0.99	1.12	1.12	0.99	0.99	1.05	1.05
Greece	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hungary1)	0.91	0.91	0.98	0.98	1.01	1.01	1.01	1.01	1.43	1.43	0.98	0.98	2.02	2.02	1.13	1.13	1.08	1.08	1.08	1.08	1.11	1.11
Ireland	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Italy	0.82	0.99	0.87	1.07	0.73	0.92	0.92	1.05	0.82	0.99	0.73	0.92	0.81	1.05	0.79	1.00	0.76	0.92	0.81	0.96	0.78	0.95
Latvia1)	0.82	0.82	0.72	0.72	0.94	0.94	0.77	0.77	0.73	0.73	0.99	0.99	1.32	1.32	0.90	0.90	0.58	0.58	0.73	0.73	0.79	0.79
Lithuania1)	1.65	1.65	1.66	1.66	2.39	2.39	1.96	1.96	1.33	1.33	1.47	1.47	1.61	1.61	2.51	2.51	2.22	2.22	3.32	3.32	2.55	2.55
Luxembourg	0.98	1.19	0.76	0.81	0.96	1.08	0.65	0.71	1.07	1.18	0.96	1.09	0.70	0.95	1.14	1.29	1.02	1.16	0.93	1.03	1.00	1.14
Malta	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Netherlands1)	1.00	1.00	0.86	0.86	1.08	1.08	0.97	0.97	0.93	0.93	1.10	1.10	1.05	1.05	1.00	1.00	0.87	0.87	0.74	0.74	0.93	0.93
Poland	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Portugal	2.59	2.65	1.94	1.76	2.55	2.13	1.89	1.52	1.94	1.68	2.77	2.27	1.64	1.43	2.14	1.94	1.80	1.55	1.85	1.58	2.07	1.76
Romania	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Slovakia	1.24	1.74	2.22	2.92	1.59	2.02	1.48	2.28	1.76	2.18	1.05	1.38	1.46	1.96	1.78	2.23	1.28	1.69	1.51	1.92	1.43	1.84
Slovenia	0.88	1.03	0.80	0.92	0.82	0.96	1.51	1.39	0.89	1.02	0.90	1.05	0.90	1.07	0.97	1.10	0.77	0.89	0.93	1.04	0.90	1.02
Spain	1.02	1.23	0.79	0.82	0.75	0.91	0.80	0.86	0.83	0.96	0.79	0.93	0.82	0.97	0.97	1.08	0.85	1.01	0.99	1.13	0.91	1.05
Sweden1)	0.63	0.63	0.64	0.64	0.67	0.67	0.62	0.62	0.69	0.69	0.66	0.66	0.63	0.63	0.61	0.61	0.79	0.79	0.70	0.70	0.68	0.68
United Kingdom1)	1.17	1.17	1.22	1.22	1.29	1.29	1.49	1.49	1.11	1.11	1.28	1.28	1.30	1.30	1.07	1.07	1.22	1.22	1.22	1.22	1.22	1.22
EU 25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
USA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Korea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Japan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Switzerland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Group 1	1.07	1.07	1.07	1.07	1.09	1.09	1.08	1.08	1.07	1.07	1.11	1.11	1.09	1.09	0.99	0.99	1.12	1.13	1.02	1.02	1.06	1.07
Group 2	0.98	1.16	0.90	1.02	0.83	0.98	0.93	1.01	0.88	1.01	0.86	0.99	0.86	1.04	0.92	1.08	0.84	0.98	0.92	1.05	0.89	1.03
Group 3	0.99	1.08	1.23	1.34	1.11	1.19	1.27	1.36	1.38	1.45	0.99	1.05	1.35	1.44	1.43	1.50	1.17	1.24	1.14	1.21	1.17	1.24
Group 4	1.15	1.15	1.17	1.17	1.42	1.42	1.33	1.33	1.18	1.18	1.19	1.19	1.11	1.11	1.56	1.56	1.31	1.31	1.69	1.69	1.49	1.49

Group 1: Austria, Belgium, Denmark, Finland, France, Germany, Netherlands, Sweden, United Kingdom. - Group 2: Cyprus, Italy, Luxembourg, Portugal, Spain. - Group 3: Czech Republic, Hungary, Slovakia, Slovenia. - Group 4: Bulgaria, Estonia, Latvia, Lithuania, - 1) Average 2006/2007: only 2006; France: only 2007.

Source: Eurostat (SBS).

Table 13: Business demography: Relative net entry (RNE) 2007

	INNO					EDU					
	High	Med-high	Med	Med-low	Low	High	Med-high	Med	Med-low	Low	Total *)
Country			2007					2007			
Austria	-0.99	1.10	-1.20	0.69	1.16	-2.24	3.62	-0.09	1.24	0.31	-1.05
Belgium	3.23	1.21	0.06	-3.97	-1.67	-0.34	-3.69	-1.93	0.35	1.04	0.23
Bulgaria	5.60	-1.97	7.65	-10.32	-5.56	12.61	-0.13	4.77	-3.63	0.03	6.17
Cyprus1)	22.54	6.34	15.33	-4.76	3.64	28.10	6.83	15.82	-5.45	-5.44	9.03
Czech Republic	0.10	-3.21	-1.81	-1.91	3.57	-3.26	-0.23	4.61	-0.30	0.35	-3.02
Denmark	0.23	2.31	0.20	-3.35	-0.76	0.02	3.34	-0.80	-1.09	0.49	0.94
Estonia1)	0.64	4.44	-0.52	-11.40	-9.15	0.57	2.46	-6.61	1.77	5.57	6.88
Finland	-0.20	-1.63	2.04	-1.72	-3.30	2.98	-15.74	-3.42	-0.32	1.15	2.50
France	-8.30	-8.91	-6.59	-7.44	-8.21	-6.16	-11.64	32.32	-7.20	-7.08	11.69
Germany	1.16	2.13	-0.24	4.80	0.30	-0.57	1.79	0.10	0.51	-0.51	-1.12
Greece	.	.	.	.	.	.	.	.	.	.	.
Hungary	0.17	1.03	-3.23	0.16	1.91	-3.53	2.81	3.13	1.70	-0.31	-3.59
Ireland	.	.	.	.	.	.	.	.	.	.	.
Italy	-1.16	-0.80	0.25	-0.52	0.14	0.26	1.42	-0.56	-0.57	0.35	-0.52
Latvia1)	0.93	1.56	-2.75	-9.67	3.49	0.21	11.00	0.70	-3.62	2.42	4.93
Lithuania1)	0.83	48.63	-5.50	-15.21	-4.43	5.73	-7.10	5.89	1.46	-5.74	10.02
Luxembourg1)	2.89	1.56	-0.87	-3.46	0.35	-1.69	6.85	1.13	-0.79	-1.46	1.50
Malta	.	.	.	.	.	.	.	.	.	.	.
Netherlands	3.96	-0.95	0.41	-6.19	-2.70	0.67	-0.25	-3.53	-1.91	1.71	5.73
Poland	.	.	.	.	.	.	.	.	.	.	.
Portugal	-8.94	-2.49	0.18	2.35	-1.78	0.16	-6.22	-2.94	2.31	0.33	-1.57
Romania	.	.	.	.	.	.	.	.	.	.	.
Slovakia	-8.09	7.56	0.14	0.77	1.23	-4.07	-3.67	-0.35	-3.66	4.84	-0.70
Slovenia	1.71	-2.03	-1.44	1.36	-1.63	1.23	0.32	-1.32	-2.80	1.06	2.78
Spain	1.87	-0.73	-0.50	6.23	0.00	-0.01	3.37	2.83	-0.96	-0.39	1.93
Sweden	-0.82	-0.37	-0.71	-0.35	-0.79	-1.09	-1.10	-1.11	-0.35	0.94	0.60
United Kingdom	0.14	-3.80	2.62	-2.23	-2.33	2.42	-3.07	-2.22	-2.72	-1.94	2.35
EU 25	-	-	-	-	-	-	-	-	-	-	-
USA	-	-	-	-	-	-	-	-	-	-	-
Korea	-	-	-	-	-	-	-	-	-	-	-
Japan	-	-	-	-	-	-	-	-	-	-	-
Switzerland	-	-	-	-	-	-	-	-	-	-	-
Group 1	-0.75	-1.44	-0.80	-0.46	-2.12	-0.93	-2.43	5.06	-1.69	-1.61	2.50
Group 2	-0.44	-0.83	0.01	1.94	0.00	0.21	1.75	0.54	-0.57	0.07	0.31
Group 3	-0.81	-0.28	-1.94	-0.52	2.13	-2.94	0.30	2.78	-0.43	0.84	-2.21
Group 4	2.79	11.19	1.57	-10.67	-4.12	6.82	0.06	2.65	-1.47	-0.28	6.49

Group 1: Austria, Belgium, Denmark, Finland, France, Germany, Netherlands, Sweden, United Kingdom. - Group 2: Cyprus, Italy, Luxembourg, Portugal, Spain. - Group 3: Czech Republic, Hungary, Slovakia, Slovenia. - Group 4: Bulgaria, Estonia, Latvia, Lithuania, - 1) 2006. *) Total economy differential.

Source: Eurostat (SBS).

Table 14: Business demography: Share of high growth enterprises in the population of active enterprises relative to the EU, measured in employment (HGF) 2006 and average 2006 and 2007

	INNO										EDU											
	High		Med-high		Med		Med-low		Low		High		Med-high		Med		Med-low		Low		Total	
Country	2006	∅ 2006/2007	2006	∅ 2006/2007	2006	∅ 2006/2007	2006	∅ 2006/2007	2006	∅ 2006/2007	2006	∅ 2006/2007	2006	∅ 2006/2007	2006	∅ 2006/2007	2006	∅ 2006/2007	2006	∅ 2006/2007	2006	∅ 2006/2007
Austria	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Belgium	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bulgaria1)	2.27	2.27	2.02	2.02	1.88	1.88	2.27	2.27	2.03	2.03	2.19	2.19	1.93	1.93	2.28	2.28	1.71	1.71	2.06	2.06	1.99	1.99
Cyprus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Czech Republic	1.37	1.37	1.71	1.71	1.14	1.14	0.63	0.63	1.21	1.21	1.05	1.05	1.38	1.38	1.18	1.18	1.28	1.28	0.90	0.90	1.10	1.10
Denmark	1.38	1.15	0.88	0.92	1.13	1.06	0.85	0.68	0.98	0.90	1.20	1.11	1.03	0.98	1.05	0.95	0.83	0.76	0.95	0.89	1.02	0.94
Estonia	1.70	1.98	1.55	1.73	1.07	1.21	1.45	1.40	1.23	1.18	0.92	0.98	1.64	1.75	1.30	1.20	1.62	1.64	1.30	1.42	1.31	1.34
Finland2)	0.67	0.67	0.39	0.39	0.67	0.67	0.50	0.50	0.54	0.54	0.82	0.82	0.66	0.66	0.53	0.53	0.61	0.61	0.62	0.62	0.66	0.66
France	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Germany	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Greece	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hungary	1.14	1.09	1.31	1.25	1.17	1.14	0.97	1.02	1.28	1.30	1.13	1.09	1.12	1.11	1.19	1.18	1.17	1.19	0.97	0.99	1.10	1.10
Ireland	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Italy	0.61	0.57	0.38	0.40	0.61	0.60	0.59	0.62	0.69	0.72	0.86	0.84	0.55	0.51	0.68	0.71	0.74	0.77	0.57	0.56	0.65	0.66
Latvia	2.66	1.76	2.63	1.92	2.71	1.93	1.82	1.71	3.28	2.29	2.61	1.84	1.75	1.56	2.95	2.08	3.15	2.24	3.31	2.47	3.01	2.19
Lithuania2)	1.74	1.74	1.93	1.93	1.68	1.68	1.76	1.76	1.92	1.92	1.31	1.31	2.11	2.11	1.75	1.75	2.04	2.04	1.90	1.90	1.81	1.81
Luxembourg	1.53	1.53	1.96	1.96	1.55	1.55	0.81	0.81	1.27	1.27	1.25	1.25	1.74	1.74	0.91	0.91	1.40	1.40	0.69	0.69	1.10	1.10
Malta	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Netherlands	1.12	1.00	0.71	0.59	1.13	1.05	0.57	0.55	0.79	0.70	1.14	1.06	0.50	0.53	0.75	0.70	0.77	0.64	0.56	0.51	0.82	0.74
Poland	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Portugal	0.96	0.96	0.61	0.61	0.73	0.73	0.48	0.48	0.76	0.76	1.16	1.16	0.71	0.71	0.84	0.84	0.74	0.74	0.67	0.67	0.75	0.75
Romania	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Slovakia	2.40	2.40	2.43	2.43	2.33	2.33	1.38	1.38	2.69	2.69	2.07	2.07	2.08	2.08	2.92	2.92	2.29	2.29	2.09	2.09	2.31	2.31
Slovenia	0.95	0.89	1.19	1.05	1.03	0.95	0.99	0.84	1.06	1.02	1.15	1.00	1.12	0.99	1.04	1.05	1.03	0.98	1.13	1.03	1.11	1.02
Spain	0.72	0.86	0.57	0.59	0.85	0.85	0.75	0.79	0.85	0.86	0.96	0.98	0.73	0.73	0.91	0.91	0.85	0.85	0.98	0.99	0.92	0.93
Sweden	1.58	1.38	0.71	0.66	1.17	1.07	0.98	0.91	0.98	0.92	1.47	1.30	0.83	0.75	1.00	0.93	0.80	0.78	0.92	0.83	1.06	0.96
United Kingdom	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Group 1	1.21	1.08	0.68	0.62	1.05	0.98	0.73	0.67	0.83	0.77	1.19	1.09	0.72	0.69	0.83	0.78	0.76	0.70	0.74	0.69	0.89	0.83
Group 2	0.67	0.70	0.47	0.49	0.70	0.70	0.64	0.67	0.76	0.77	0.91	0.91	0.63	0.61	0.77	0.79	0.78	0.80	0.71	0.72	0.75	0.76
Group 3	1.39	1.37	1.62	1.59	1.30	1.28	0.88	0.88	1.42	1.42	1.23	1.19	1.36	1.35	1.41	1.40	1.36	1.36	1.11	1.11	1.26	1.25
Group 4	2.11	2.02	2.02	1.94	1.83	1.74	1.96	1.94	2.07	1.92	1.85	1.75	1.91	1.90	2.11	1.97	1.99	1.86	2.09	1.99	2.00	1.88

Group 1: Denmark, Finland, Netherlands, Sweden. - Group 2: Italy, Luxembourg, Portugal, Spain .- Group 3: Czech Republic, Hungary, Slovakia, Slovenia. - Group 4: Bulgaria, Estonia, Latvia, Lithuania, - 1) 2006; 2) 2005.

Source: Eurostat (SBS).

Table 15: Business demography: Share of high growth enterprises in the population of active enterprises, relative to the EU, measured in turnover (HGF) 2006 and average 2006 and 2007

	INNO										EDU											
	High		Med-high		Med		Med-low		Low		High		Med-high		Med		Med-low		Low		Total	
		∅		∅		∅		∅		∅		∅		∅		∅		∅		∅		∅
Country	2006	2006/2007	2006	2006/2007	2006	2006/2007	2006	2006/2007	2006	2006/2007	2006	2006/2007	2006	2006/2007	2006	2006/2007	2006	2006/2007	2006	2006/2007	2006	2006/2007
Austria	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Belgium	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Bulgaria1)	1.60	1.60	1.54	1.54	1.45	1.45	1.91	1.91	1.52	1.52	1.27	1.27	1.45	1.45	1.58	1.58	1.53	1.53	1.56	1.56	1.53	1.53
Cyprus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Czech Republic	0.97	0.97	1.02	1.02	0.90	0.90	0.85	0.85	0.82	0.82	0.84	0.84	0.98	0.98	0.83	0.83	1.01	1.01	0.94	0.94	0.92	0.92
Denmark	1.06	0.99	0.86	0.81	0.95	0.90	0.53	0.50	1.00	1.00	0.94	0.90	0.82	0.80	1.08	1.03	0.65	0.68	1.02	0.96	0.94	0.91
Estonia	1.37	1.37	1.73	1.78	1.45	1.40	1.81	1.72	1.40	1.44	1.42	1.27	1.59	1.66	1.36	1.36	1.79	1.80	1.79	1.71	1.65	1.60
Finland2)	0.69	0.69	0.40	0.40	0.95	0.95	0.93	0.93	0.55	0.55	1.33	1.33	1.17	1.17	0.61	0.61	0.42	0.42	0.55	0.55	0.70	0.70
France	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Germany	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Greece	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hungary	0.96	0.94	1.10	1.07	1.02	0.96	1.03	0.94	0.94	0.89	0.95	0.89	1.08	1.04	0.90	0.85	0.92	0.87	0.99	0.94	0.96	0.91
Ireland	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Italy	0.65	0.61	0.46	0.45	0.67	0.66	0.45	0.43	0.52	0.53	0.68	0.67	0.65	0.64	0.56	0.56	0.50	0.50	0.62	0.62	0.60	0.60
Latvia	2.09	1.83	2.29	1.94	2.38	2.09	2.11	1.96	2.48	2.20	2.60	2.22	2.03	1.84	2.11	1.88	2.93	2.48	2.60	2.28	2.52	2.19
Lithuania2)	1.15	1.15	1.29	1.29	1.26	1.26	1.48	1.48	1.30	1.30	0.99	0.99	1.22	1.22	1.11	1.11	1.37	1.37	1.51	1.51	1.33	1.33
Luxembourg	0.89	0.89	0.68	0.68	1.06	1.06	0.34	0.34	0.78	0.78	1.08	1.08	0.93	0.93	0.71	0.71	0.71	0.71	0.48	0.48	0.70	0.70
Malta	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Netherlands	0.74	0.72	0.55	0.58	0.64	0.64	0.46	0.42	0.57	0.56	0.68	0.69	0.45	0.46	0.67	0.65	0.39	0.39	0.51	0.47	0.55	0.54
Poland	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Portugal	0.74	0.74	0.53	0.53	0.66	0.66	0.52	0.52	0.50	0.50	0.87	0.87	0.63	0.63	0.55	0.55	0.51	0.51	0.65	0.65	0.63	0.63
Romania	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Slovakia	0.46	0.46	0.54	0.54	0.37	0.37	0.10	0.10	0.13	0.13	0.41	0.41	0.50	0.50	0.18	0.18	0.20	0.20	0.30	0.30	0.27	0.27
Slovenia	0.99	0.93	1.03	0.96	1.01	0.98	0.74	0.79	0.99	0.93	1.06	1.01	0.99	0.92	0.99	0.95	0.97	0.93	1.13	1.08	1.06	1.01
Spain	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sweden	1.14	1.11	0.88	0.78	1.12	1.03	0.72	0.72	0.91	0.83	1.23	1.18	1.08	0.96	0.96	0.87	0.70	0.66	1.01	0.90	0.98	0.90
United Kingdom	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Group 1	0.91	0.88	0.67	0.64	0.90	0.86	0.64	0.63	0.74	0.71	1.01	1.00	0.84	0.80	0.81	0.77	0.53	0.53	0.75	0.70	0.77	0.74
Group 2	0.66	0.62	0.47	0.46	0.68	0.66	0.45	0.44	0.52	0.53	0.70	0.69	0.65	0.64	0.56	0.56	0.51	0.50	0.62	0.62	0.61	0.60
Group 3	0.90	0.89	0.98	0.96	0.88	0.85	0.79	0.77	0.78	0.76	0.84	0.81	0.95	0.92	0.78	0.76	0.86	0.85	0.89	0.87	0.86	0.84
Group 4	1.52	1.49	1.61	1.57	1.54	1.49	1.82	1.78	1.59	1.55	1.41	1.33	1.49	1.48	1.51	1.48	1.73	1.66	1.73	1.67	1.64	1.58

Group 1: Denmark, Finland, Netherlands, Sweden. - Group 2: Italy, Luxembourg, Portugal. - Group 3: Czech Republic, Hungary, Slovakia, Slovenia. - Group 4: Bulgaria, Estonia, Latvia, Lithuania, - 1) 2006. - 2) 2005.

Source: Eurostat (SBS).

Table 16: Shares of exports in low price segment as percent and change in percentage points, NACE 3-digit manufacturing

	Mainstream industries			Labour-intensive industries			Capital-intensive industries			Marketing-driven industries			Technology-driven industries			High RQE			Medium RQE			Low RQE			Total industry		
	2009	Change 99/09	Change 07/09	2009	Change 99/09	Change 07/09	2009	Change 99/09	Change 07/09	2009	Change 99/09	Change 07/09	2009	Change 99/09	Change 07/09	2009	Change 99/09	Change 07/09	2009	Change 99/09	Change 07/09	2009	Change 99/09	Change 07/09	2009	Change 99/09	Change 07/09
Austria	23.0	3.9	0.1	20.3	4.5	-4.3	30.2	-4.4	-1.8	27.4	-3.7	-2.4	11.1	3.2	2.4	14.4	1.7	1.7	22.9	2.6	-1.7	32.2	1.0	-3.2	21.6	1.8	-0.6
Belgium	28.0	0.1	-1.3	28.5	-6.9	-0.2	42.3	7.9	0.9	36.1	3.0	-4.2	10.3	-6.5	1.1	12.9	-9.2	0.0	40.2	12.6	4.6	39.6	4.8	-4.0	28.4	0.7	-1.2
Bulgaria	73.7	-1.2	-7.3	58.5	-29.7	-11.6	47.1	-20.9	-3.0	56.3	-11.5	-1.0	36.6	-36.0	-11.1	52.0	-28.9	-15.1	54.2	-4.1	3.2	56.4	-23.2	-5.6	54.4	-20.1	-5.4
Cyprus	62.4	-2.0	31.1	62.1	16.9	34.2	56.4	-15.1	-8.8	32.6	2.4	11.6	31.6	9.8	10.4	22.9	-5.3	1.0	68.6	19.8	50.4	57.5	-1.9	-2.2	38.9	-5.9	9.6
Czech Republic	51.0	-16.4	-5.5	43.5	-14.5	-4.5	41.0	-39.7	-19.3	58.7	-12.9	0.1	41.9	-13.0	1.5	33.8	-31.7	-15.2	51.1	-6.6	0.1	60.3	-13.0	-2.2	46.2	-19.8	-7.5
Denmark	15.5	-4.2	-5.6	20.1	7.0	-1.0	31.5	-8.9	-5.1	28.1	11.4	3.8	10.6	2.0	-1.1	14.7	3.8	0.4	25.2	7.5	0.2	20.4	-7.6	-8.9	20.1	2.9	-2.1
Estonia	47.6	-5.9	-3.3	46.6	-26.1	-1.1	36.7	-22.7	-22.1	51.0	-8.9	7.0	25.0	11.5	-2.9	37.3	-7.2	6.2	34.1	-26.2	-20.1	57.2	-0.8	3.0	41.8	-12.1	-5.7
Finland	14.8	-7.3	-1.5	42.4	15.9	18.7	47.9	-4.9	-2.7	33.5	-2.5	-2.7	5.6	0.5	-1.8	10.4	1.8	-0.2	32.3	10.4	12.0	40.4	-4.7	-5.8	28.2	-0.1	0.7
France	18.2	-1.8	-2.7	18.2	3.8	1.9	42.8	15.1	-1.3	19.4	-1.0	-1.3	9.8	-6.0	-0.9	13.2	-3.1	-1.6	27.8	9.0	-0.8	29.7	2.7	-4.1	20.9	1.8	-2.5
Germany	12.2	2.6	-1.1	14.1	5.7	0.5	28.0	0.4	-2.3	30.6	4.6	1.9	4.6	-2.9	0.0	9.8	-0.9	-0.2	16.4	3.9	0.3	22.9	3.4	-1.8	14.4	1.4	-0.4
Greece	60.0	9.3	-4.5	36.9	10.5	-0.7	60.8	-5.5	-6.8	40.7	3.8	0.9	18.4	-4.5	5.6	32.4	0.1	-0.6	41.7	-0.7	-5.2	60.7	6.6	-3.7	46.1	2.7	-3.8
Hungary	38.6	-11.8	-1.5	32.5	-6.3	-2.9	44.6	-15.8	-0.8	47.5	4.0	2.6	25.1	-0.5	-8.8	23.0	-1.1	-9.3	36.6	4.5	-1.7	45.0	-17.7	-1.9	32.4	-5.0	-5.2
Ireland	18.7	5.1	0.5	13.9	-6.0	7.3	5.2	-0.2	-0.2	27.1	12.2	11.2	6.6	-11.6	-0.4	9.3	-1.2	-0.9	14.1	-9.9	6.0	4.9	-0.8	-0.9	9.3	-5.7	1.0
Italy	35.5	2.8	-0.6	16.3	4.8	-0.4	51.8	8.2	0.8	27.3	0.5	-0.1	24.5	3.4	0.1	23.9	1.1	-4.3	38.6	9.7	3.0	41.8	7.1	0.8	33.0	5.9	-0.8
Latvia	45.5	-12.1	-8.2	70.6	-15.8	0.8	66.4	8.7	-4.1	57.3	-8.2	-2.6	16.1	-10.8	-23.5	36.8	-20.6	-12.4	49.2	-13.0	-13.3	69.1	-15.2	-1.8	52.7	-20.0	-8.9
Lithuania	49.8	-20.6	-9.5	59.7	-15.5	-1.3	72.6	-6.9	-7.4	54.1	-21.1	9.0	46.1	-29.6	-12.5	51.1	-29.8	-1.4	59.4	-8.1	-4.6	71.4	-8.8	-3.3	60.1	-15.7	-3.5
Luxembourg	28.8	-11.3	-11.0	34.2	-25.6	-7.3	30.0	-0.5	-37.8	17.3	-11.6	-10.2	2.0	-19.5	-4.8	9.5	-15.8	-9.9	9.0	-22.6	-5.8	31.7	-6.1	-33.3	15.3	-17.2	-19.1
Malta	32.0	9.1	7.8	29.5	27.4	-19.9	33.4	-3.2	17.9	22.1	-5.8	5.7	4.5	-0.7	-0.3	19.0	12.5	-1.7	6.3	-18.4	2.3	17.9	-38.4	1.5	11.6	-13.2	1.7
Netherlands	25.3	3.0	0.8	25.6	-1.7	5.6	55.7	6.8	9.6	32.2	1.1	-1.6	15.9	-8.6	2.3	17.1	0.2	3.9	34.8	-1.9	2.5	43.9	3.4	-2.2	31.2	0.2	0.3
Poland	62.9	-10.9	1.6	63.1	1.7	6.1	46.8	-28.0	-9.9	58.8	-1.3	5.6	39.8	-21.1	3.8	37.3	-21.0	-5.3	61.5	-2.3	2.1	61.4	-13.9	4.1	53.5	-12.9	0.3
Portugal	50.4	2.2	-2.5	34.2	8.6	-2.2	54.6	3.8	-3.9	29.2	-8.1	-9.6	40.3	6.3	10.4	37.0	1.4	-4.9	41.8	2.8	7.3	48.8	10.3	-5.6	42.1	4.7	-2.1
Romania	56.9	-20.2	-6.6	46.5	-31.3	-6.7	57.2	-21.2	-8.9	46.6	-12.6	-7.5	62.4	17.2	5.3	51.2	-23.0	-2.2	46.2	-15.8	-6.5	68.5	-15.4	-4.5	54.3	-19.9	-5.5
Slovakia	49.3	-28.4	-7.0	38.5	-18.1	-6.5	45.9	-18.3	-1.1	38.4	-27.2	-8.4	42.3	29.5	21.9	40.6	8.9	6.7	38.3	-18.4	0.1	48.7	-30.2	4.8	43.5	-11.6	4.7
Slovenia	59.5	-9.1	0.8	37.2	6.3	0.1	50.8	-6.7	8.4	37.9	-7.7	-1.4	55.5	28.1	4.2	56.3	21.6	4.2	38.8	-6.1	1.0	54.9	-9.1	2.9	51.4	3.9	2.9
Spain	51.9	10.1	0.8	35.6	5.8	3.4	56.5	-2.4	2.7	41.0	10.7	5.5	42.9	1.4	25.4	46.2	3.7	13.8	45.2	6.1	1.8	48.6	4.8	3.7	46.7	4.6	7.5
Sweden	19.4	4.0	2.5	35.9	16.7	20.9	32.4	11.6	4.6	21.9	4.3	1.8	8.9	2.1	0.5	12.4	3.7	1.4	28.6	11.2	4.6	27.4	7.4	6.5	21.9	7.9	4.4
United Kingdom	18.9	5.6	0.5	21.8	4.3	4.1	42.8	9.1	0.9	25.2	7.2	3.3	15.7	0.3	6.9	19.5	2.0	5.4	31.8	12.8	4.1	24.0	4.4	-1.8	23.8	5.4	3.3
Group 1	17.1	1.4	-0.8	20.1	3.7	3.0	38.0	6.1	0.8	28.5	4.2	0.8	9.1	-4.2	1.6	12.7	-1.5	0.8	26.4	5.6	2.5	29.5	3.2	-2.2	20.7	1.8	0.3
Group 2	40.4	5.2	0.0	24.2	7.8	1.6	53.3	3.8	-0.4	32.9	4.3	1.6	32.2	2.0	11.6	32.6	3.7	2.5	39.3	7.2	2.5	45.2	6.8	0.0	38.0	5.9	1.5
Group 3	53.5	-13.5	-2.1	50.1	-3.7	0.7	45.0	-26.1	-8.5	54.1	-4.3	2.4	37.5	1.0	3.5	34.7	-11.7	-5.9	50.9	-0.4	1.3	55.8	-15.8	2.0	46.1	-10.1	-1.5
Group 4	56.5	-14.8	-6.3	52.1	-26.9	-5.0	57.1	-16.1	-6.3	50.7	-11.4	0.8	45.1	5.1	3.9	47.8	-23.4	-3.6	47.9	-13.4	-4.4	64.9	-13.8	-3.2	52.8	-18.3	-4.6
EU 27	25.9	3.1	-0.6	26.8	5.3	2.5	41.4	4.4	-0.3	31.9	5.1	1.2	15.0	-1.0	3.6	18.1	-0.2	0.9	31.6	7.1	2.4	36.0	4.2	-1.0	26.6	3.3	0.5

Group 1: Austria, Belgium, Denmark, Finland, France, German, Ireland, Netherlands, Sweden, United Kingdom. - Group 2: Greece, Italy, Luxembourg, Portugal, Spain. - Group 3: Czech Republic, Hungary, Poland, Slovakia, Slovenia. - Group 4: Bulgaria, Cyprus, Estonia, Latvia, Lithuania, Malta, Romania.

Source: Eurostat (Comext). - Including intra-EU exports.

Table 17: Shares of exports in high price segment as percent and change in percentage points, NACE 3-digit manufacturing

	Mainstream industries			Labour-intensive industries			Capital-intensive industries			Marketing-driven industries			Technology-driven industries			High RQE			Medium RQE			Low RQE			Total industry		
	2009	Change 99/09	Change 07/09	2009	Change 99/09	Change 07/09	2009	Change 99/09	Change 07/09	2009	Change 99/09	Change 07/09	2009	Change 99/09	Change 07/09	2009	Change 99/09	Change 07/09	2009	Change 99/09	Change 07/09	2009	Change 99/09	Change 07/09	2009	Change 99/09	Change 07/09
Austria	36.5	-2.1	-0.7	39.4	-3.3	7.0	18.4	-0.9	1.6	37.9	-3.6	0.2	54.9	1.4	3.0	49.6	0.2	3.0	34.6	-4.9	0.8	23.6	-1.7	1.5	38.4	-1.7	2.1
Belgium	30.4	-0.5	1.1	38.4	14.6	-2.3	16.7	3.9	1.7	18.5	-10.6	-3.3	63.7	20.7	-2.6	55.8	16.6	-1.3	19.7	-8.8	-2.6	19.5	3.9	3.1	35.0	6.2	1.1
Bulgaria	10.4	4.1	4.0	7.8	5.9	0.8	6.7	-1.1	1.4	20.2	4.4	-6.9	29.3	18.3	-2.5	19.7	12.5	4.5	8.8	-6.1	-3.0	9.0	6.0	4.3	45.6	20.1	5.4
Cyprus	26.1	11.5	-29.5	20.5	-5.4	-25.0	28.9	21.6	10.5	55.9	22.5	3.3	40.9	23.9	3.8	52.8	26.6	-3.3	17.0	-8.3	0.5	24.6	15.6	1.8	40.1	20.7	-0.9
Czech Republic	18.9	5.7	3.3	16.8	9.0	-1.7	9.4	4.2	3.7	11.6	4.1	1.9	11.2	-0.1	-9.5	13.7	7.2	0.7	11.6	-1.4	-6.0	16.0	5.1	5.4	13.7	4.1	-0.1
Denmark	37.6	-0.2	2.0	30.9	-1.9	2.2	19.0	-3.5	1.9	29.1	-10.4	-4.1	59.5	-0.1	-0.7	45.8	-5.2	-1.8	29.0	-8.1	-0.5	34.4	5.1	4.3	36.6	-4.1	0.4
Estonia	18.3	-2.6	-0.4	12.0	8.6	-1.3	9.1	-2.3	4.0	25.4	11.1	-6.4	25.9	-6.2	-10.9	24.3	12.0	-4.6	13.6	3.3	-2.9	13.3	-5.3	2.3	16.4	2.0	-1.9
Finland	40.9	2.5	5.5	18.5	-1.2	-0.8	10.0	-1.0	-0.2	33.3	2.7	4.1	74.5	3.1	-2.4	59.9	-5.7	-3.5	32.5	5.9	4.2	15.1	-3.0	1.0	34.7	-1.6	-0.6
France	35.7	3.2	4.6	52.5	13.8	-0.3	16.4	-2.1	2.7	42.1	0.4	2.1	44.7	-1.0	-3.5	42.6	-0.8	0.2	32.5	-1.8	0.6	29.7	3.1	5.7	37.0	-0.8	2.1
Germany	41.2	-1.9	5.7	43.0	-5.6	2.5	20.1	2.4	6.2	23.7	-6.6	-2.1	51.5	-3.0	-9.2	48.9	-2.0	-2.3	32.1	-8.2	-0.9	25.4	0.1	3.9	39.5	-3.6	-0.7
Greece	13.9	-2.7	3.7	30.8	13.7	-0.7	5.3	2.3	-2.1	25.5	9.2	1.4	37.2	-11.8	0.9	28.4	10.0	0.7	19.6	0.8	-1.1	13.8	2.8	3.4	20.1	4.5	1.6
Hungary	24.8	-1.8	-6.9	18.9	-2.3	7.8	14.4	5.5	2.0	26.5	-3.2	-1.9	21.8	-20.3	-6.1	25.7	1.8	-3.9	22.4	-29.6	-0.8	14.0	-4.5	-5.1	21.6	-10.2	-3.6
Ireland	58.4	-8.5	-3.1	77.4	28.2	-1.5	91.7	0.6	-0.2	42.3	-13.6	-5.1	80.2	14.0	8.8	79.3	7.3	3.8	58.3	2.2	3.3	90.5	1.3	1.0	77.4	8.0	4.1
Italy	16.5	1.7	4.1	49.4	-0.6	1.2	15.8	0.3	3.4	33.9	4.4	-1.4	42.9	8.0	-2.2	36.1	2.5	2.9	21.7	-2.9	1.5	20.1	2.5	2.8	27.5	0.0	2.6
Latvia	24.4	15.0	4.0	9.4	7.0	0.9	14.4	-18.6	3.6	20.3	1.0	0.1	31.7	26.1	8.4	27.8	21.9	6.4	19.2	0.4	6.1	11.2	2.4	-0.8	19.1	8.6	3.8
Lithuania	17.2	8.7	3.4	14.0	11.3	3.7	1.6	-0.7	-2.0	14.7	2.5	-0.6	24.6	21.6	7.6	20.7	17.2	8.7	7.7	1.8	-2.1	9.3	4.9	-1.2	11.5	6.9	0.8
Luxembourg	35.4	0.5	1.0	34.0	14.4	-4.5	26.1	9.4	19.2	58.0	19.9	16.2	75.2	14.5	21.7	76.5	27.6	21.6	55.6	5.6	10.5	27.0	10.4	15.5	54.5	19.2	20.1
Malta	54.7	-16.3	-7.6	50.4	-27.5	35.8	56.6	46.9	12.1	46.8	-17.5	-6.7	73.6	10.7	-6.8	41.6	-26.0	-4.2	83.4	23.2	-3.0	51.2	26.9	-5.2	66.2	8.4	-5.8
Netherlands	38.1	4.6	-7.2	40.3	14.6	-7.0	10.9	0.0	0.3	24.4	-6.2	1.2	39.8	1.2	-12.2	45.6	0.8	-11.1	23.0	-2.2	-1.5	18.0	1.8	3.9	29.4	-0.2	-1.6
Poland	7.9	1.6	-1.1	10.3	-0.6	0.5	7.0	1.4	1.4	15.0	-1.6	-2.3	16.8	-6.6	-8.3	14.1	-0.4	-6.0	14.2	-0.8	1.8	6.3	0.7	-0.4	11.5	0.2	-1.3
Portugal	11.9	-10.1	-0.2	20.5	3.8	-1.6	6.1	1.1	0.1	16.6	-12.9	-8.5	15.6	3.3	-18.2	13.6	-0.6	-4.6	16.7	-3.0	-14.9	12.6	-3.2	3.3	14.1	-1.9	-4.9
Romania	18.0	8.2	7.0	11.9	9.9	1.8	13.2	6.9	0.0	32.2	2.9	8.8	17.3	-22.3	-1.2	19.7	8.5	1.6	17.6	9.1	4.9	10.5	3.4	1.8	16.5	7.3	3.3
Slovakia	18.2	8.4	0.7	21.6	16.5	5.1	8.4	4.2	-1.0	31.5	20.2	1.3	23.8	6.5	16.4	14.5	0.3	3.2	19.1	14.1	0.6	25.4	19.3	14.4	20.1	11.2	7.4
Slovenia	13.3	7.2	3.2	30.6	1.4	1.5	11.5	0.0	0.0	15.6	-2.3	-2.3	10.5	0.9	-3.1	11.1	-2.8	-3.0	22.2	2.5	1.2	13.9	4.2	2.3	14.8	0.8	-0.1
Spain	13.5	-3.2	-2.0	22.6	-7.1	-4.7	12.2	0.8	2.8	18.2	-13.4	-2.0	17.0	-3.2	-43.5	17.2	-4.2	-25.2	14.1	-7.3	-1.0	15.6	-2.7	0.1	16.0	-4.6	-11.0
Sweden	38.9	-2.3	-0.7	29.5	-3.1	-4.2	21.1	3.3	-2.8	34.6	-12.8	-4.6	56.6	-6.8	2.1	54.4	0.2	2.6	27.7	-9.3	-5.9	26.5	-3.9	0.2	37.7	-5.7	-1.2
United Kingdom	41.8	-3.0	-0.7	49.0	2.4	0.0	30.6	1.1	4.1	34.4	-8.7	-2.8	51.0	3.9	-3.9	47.9	3.8	-1.4	31.3	-12.1	-6.8	43.9	2.2	6.7	42.6	-0.8	-0.8
Group 1	39.2	-0.4	2.5	42.3	2.5	0.5	21.0	0.2	2.8	29.2	-7.6	-1.6	52.8	2.2	-5.9	49.9	2.0	-1.6	29.8	-7.3	-2.2	27.8	0.0	3.4	38.8	-1.4	-0.2
Group 2	15.9	0.0	2.5	38.4	-4.1	-2.6	13.8	0.7	3.2	26.8	-2.9	-2.6	31.6	3.3	-19.2	28.6	-0.6	-6.7	20.9	-3.3	-0.1	17.9	0.5	2.3	23.4	-1.5	-1.8
Group 3	15.6	2.9	0.0	15.6	2.7	1.5	9.2	3.0	1.6	17.3	0.2	-1.2	17.4	-10.3	-4.1	16.4	2.0	-3.0	15.7	-8.6	-1.2	13.8	3.7	3.1	15.4	-0.5	-0.4
Group 4	17.7	7.1	4.3	11.6	9.2	1.5	8.8	0.7	0.0	24.9	2.0	0.5	27.1	2.5	-6.8	22.0	12.3	2.6	16.1	4.8	-0.6	10.7	2.7	1.7	16.6	7.0	1.6
EU 27	32.0	-0.9	2.1	36.2	-1.0	-0.3	18.7	-0.1	2.7	27.7	-6.8	-1.8	46.5	-1.0	-8.0	43.5	0.2	-2.9	26.5	-7.6	-1.8	24.1	-0.5	2.9	33.6	-2.5	-0.7

Group 1: Austria, Belgium, Denmark, Finland, France, German, Ireland, Netherlands, Sweden, United Kingdom. - Group 2: Greece, Italy, Luxembourg, Portugal, Spain. - Group 3: Czech Republic, Hungary, Poland, Slovakia, Slovenia. - Group 4: Bulgaria, Cyprus, Estonia, Latvia, Lithuania, Malta, Romania.

Source: Eurostat (Comext). - Including intra-EU exports.

Table 18: R&D decomposition

Country	Year	RD intensity 2007	RD intensity Change 2004	Sector effect 2007	Sector effect Change 2004	Country effect 2007	Country effect Change 2004	Structural change effect	Change in sectoral R&D intensity	Dynamic interaction effect
Austria	2007	1.97	0.27	1.55	0.03	0.42	0.25	-0.05	0.25	0.07
Belgium	2007	1.48	0.04	1.39	-0.08	0.09	0.13	-0.05	0.10	-0.01
Bulgaria	2006	0.14	0.02	1.14	0.01	-1.00	0.01	0.00	0.02	0.00
Cyprus	2007	0.11	0.03	0.47	-0.03	-0.36	0.06	0.00	0.03	0.00
Czech Republic	2007	1.06	0.19	1.96	0.07	-0.90	0.12	0.07	0.12	0.00
Germany	2007	1.97	0.05	2.19	0.14	-0.21	-0.09	0.16	-0.09	-0.02
Denmark	2007	2.26	0.29	1.26	0.01	1.00	0.28	0.00	0.37	-0.08
Estonia	2007	0.63	0.23	1.09	-0.03	-0.46	0.26	0.04	0.18	0.02
Spain	2006	0.74	0.11	1.06	-0.04	-0.32	0.15	-0.02	0.13	-0.01
Finland	2007	3.08	0.09	2.78	0.17	0.30	-0.08	0.16	-0.05	-0.03
France	2007	1.50	-0.07	1.24	-0.10	0.26	0.03	-0.12	0.02	0.02
Greece	2005	0.20	0.00	0.63	-0.01	-0.42	0.01	0.00	0.01	-0.01
Hungary	2007	0.57	0.15	2.13	-0.08	-1.56	0.23	0.02	0.13	0.00
Ireland	2007	0.92	0.00	2.72	-0.39	-1.80	0.39	0.14	0.11	-0.24
Italy	2007	0.68	0.10	1.40	0.01	-0.72	0.09	0.01	0.09	0.00
Latvia	2007	0.27	0.08	1.12	-0.06	-0.86	0.14	0.03	0.06	0.00
Lithuania	2007	0.21	0.00	0.68	-0.07	-0.46	0.07	-0.02	0.02	0.00
Luxembourg	2007	-	-	-	-	-	-	-	-	-
Malta	2007	0.53	0.26	2.02	0.23	-1.49	0.03	0.15	0.12	-0.01
Netherlands	2007	1.07	-0.09	1.19	-0.04	-0.11	-0.05	-0.02	0.08	-0.15
Poland	2007	0.20	0.01	1.24	0.02	-1.05	-0.01	0.02	-0.01	0.00
Portugal	2006	0.54	0.22	0.87	-0.04	-0.33	0.26	-0.01	0.23	0.00
Romania	2007	0.23	0.00	1.38	0.10	-1.15	-0.11	0.00	0.01	-0.02
Sweden	2007	2.97	-0.01	1.95	-0.10	1.03	0.09	-0.16	0.20	-0.05
Slovakia	2007	0.21	-0.08	1.63	0.14	-1.42	-0.22	-0.03	-0.05	0.00
Slovenia	2007	0.99	-0.08	1.83	-0.12	-0.85	0.04	-0.06	0.02	-0.04
United Kingdom	2006	1.22	0.03	1.27	-0.01	-0.05	0.05	0.00	0.04	-0.01
Australia	2006	0.97	0.04	0.97	0.00	0.00	0.04	0.00	0.05	-0.01
Canada	2006	1.15	-0.10	1.11	-0.10	0.04	0.00	-0.06	-0.03	-0.01
Israel	2006	4.33	0.40	2.33	0.21	2.00	0.19	0.73	-0.15	-0.17
Island	2007	1.75	0.13	0.68	-0.17	1.07	0.30	-0.33	1.04	-0.58
Japan	2006	2.66	0.21	2.13	0.04	0.53	0.17	0.04	0.20	-0.03
Kroatia	2007	2.73	0.43	3.33	-0.13	-0.60	0.56	-0.07	0.55	-0.04
Norway	2007	1.09	0.07	1.09	0.07	0.00	0.00	0.05	0.03	-0.01
New Zealand	2005	0.47	0.01	0.97	0.00	-0.50	0.01	0.00	0.01	0.00
Turkey	2007	0.33	0.19	1.45	-0.05	-1.13	0.24	-0.01	0.19	0.00
USA	2007	1.86	0.08	1.34	0.00	0.52	0.09	0.02	0.08	-0.01
Group 1	2006	1.77	0.08	1.63	0.00	0.14	0.08	0.01	0.09	-0.01
Group 2	2005	0.59	0.04	1.17	-0.03	-0.57	0.07	-0.01	0.05	0.00
Group 3	2007	0.43	0.05	1.59	0.01	-1.16	0.04	0.02	0.03	0.00
Group 4	2006	0.27	0.05	1.23	0.04	-0.96	0.01	0.01	0.04	0.00

Source: OECD (STAN), Eurostat.

Table 19: RLP level, 2007, change 2007 to 2000, NACE 2-digit manufacturing

	INNO										EDU									
	High		Med-high		Med		Med-low		Low		High		Med-high		Med		Med-low		Low	
Country	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change
Austria	2	0	2	0	3	1	2	-1	4	2	4	0	2	-2	3	0	4	1	1	0
Belgium	3	1	4	1	3	-1	3	-1	3	1	4	-1	3	1	4	1	3	0	3	-1
Bulgaria																				
Cyprus	5	0	1	0	1	-2	5	0	4	0	1	0	4	0	3	1	2	0	4	1
Czech Republic	4	0	3	-1	2	1	2	1	1	-2	2	1	5	0	5	0	2	0	3	2
Denmark	3	0	3	-1	4	0	3	0	2	0	4	-1	3	-1	4	0	2	0	3	1
Estonia	2	-2	5	0	1	-4	4	-1	1	0	1	-2	5	0	1	0	3	1	5	0
Finland	1	0	4	1	3	1	3	-1	4	0	5	3	1	-1	4	-1	4	0	3	0
France	3	0	4	0	5	1	4	0	5	1	5	0	3	0	2	-1	3	-1	3	1
Germany	1	-2	2	0	4	3	4	2	5	0	5	1	2	-1	2	-1	5	0	4	0
Greece	5	0	4	-1	5	2	5	3	2	-3	5	3	5	0	3	2	1	-4	2	0
Hungary	3	-1	1	0	1	0	5	2	2	-1	2	1	4	3	1	0	5	0	5	0
Ireland	1	0	1	0	5	0	1	0	5	0	2	-1	1	0	4	-1	5	0	5	3
Italy	4	1	5	0	4	0	2	-1	3	1	5	0	5	1	2	0	1	0	4	-1
Latvia	5	0	5	2	5	0	5	0	1	0	1	0	5	4	1	0	3	0	5	0
Lithuania	4	-1	5	0	5	0	4	-1	3	-1	3	-1	5	0	1	0	1	0	5	0
Luxembourg	5	4	1	-1	1	0	3	1	1	-4	2	0	1	-2	1	-2	5	0	5	1
Malta	1	0	5	0	2	-1	5	0	2	1	1	-1	4	1	5	0	1	0	2	-1
Netherlands	2	0	1	0	5	0	1	0	1	0	5	0	1	0	2	0	5	0	1	0
Poland 1)	5	0	5	0	3	1	5	0	3	0	2	0	4	-1	5	0	1	0	1	0
Portugal	2	0	2	0	1	0	1	0	5	0	1	0	1	0	2	0	4	0	4	-1
Romania																				
Slovakia	5	0	2	1	2	0	1	-1	5	0	3	0	3	1	5	0	2	1	1	-3
Slovenia 1)	4	1	3	0	3	0	3	0	3	0	3	0	3	0	5	1	2	0	2	-1
Spain	3	1	3	1	2	-3	2	-2	5	3	3	-2	2	0	3	1	3	0	1	0
Sweden	2	-2	3	-1	4	1	2	1	2	1	4	0	2	-3	5	1	4	1	2	0
United Kingdom	1	0	2	-1	2	0	1	-1	4	1	3	0	2	0	3	-1	5	1	2	-1
EU 25	2	-1	3	0	4	1	3	0	3	0	4	0	3	0	3	0	4	1	3	0
USA	1	0	5	1	1	0	1	0	3	1	4	0	1	0	1	0	4	0	5	0
Korea	1	0	1	0	4	3	1	0	5	0	3	2	1	0	5	0	5	0	4	3
Japan 1)	1	0	2	0	3	1	3	0	5	0	3	1	1	0	3	0	5	0	4	-1
Switzerland																				
Group 1	1	-1	2	0	4	1	2	0	4	0	4	0	2	-1	3	0	5	1	3	0
Group 2	4	1	4	0	4	0	2	-1	3	0	3	-1	4	1	2	0	2	0	3	0
Group 3	4	-1	3	2	2	0	1	-1	5	0	3	1	3	0	5	0	2	1	1	-2
Group 4	4	-1	5	0	5	0	4	-1	2	0	2	0	5	1	1	0	2	0	5	0

Group 1: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Netherlands, Sweden, United Kingdom. - Group 2: Cyprus, Greece, Italy, Luxembourg, Portugal, Spain .- Group 3: Czech Republic, Hungary, Malta, Poland, Slovakia, Slovenia. - Group 4: Estonia, Latvia, Lithuania. - 1) 2006

Source: OECD (STAN), EU KLEMS.

Table 20: RLP growth, change 2007 against 1999

	INNO										EDU										Total economy differential	
	High		Med-high		Med		Med-low		Low		High		Med-high		Med		Med-low		Low			
Country	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change	2007	Change
Austria	-	0	+	0	0	0	+	+	-	-	-	0	+	0	0	0	0	0	+	0	0	0
Belgium	-	-	+	-	-	+	+	0	-	-	-	+	-	-	0	-	+	0	+	0	0	0
Bulgaria																						
Cyprus	-	-	-	-	+	+	-	0	-	0	-	+	+	0	-	0	-	0	0	-	-	0
Czech Republic	0	+	+	0	+	-	-	-	-	+	+	-	-	+	0	0	-	+	0	-	+	+
Denmark	+	0	+	0	-	0	+	0	-	0	-	0	+	+	+	0	0	0	0	-	-	0
Estonia	-	+	-	0	+	+	+	+	+	0	+	+	-	+	+	0	+	0	-	0	+	+
Finland	+	+	-	0	-	-	+	+	-	-	-	-	+	+	-	0	0	-	-	0	+	+
France	-	0	0	0	0	0	-	0	0	0	0	0	-	0	+	0	+	0	0	0	0	0
Germany	+	0	-	0	-	-	0	-	+	0	-	0	+	0	0	0	-	0	-	0	0	0
Greece	-	0	-	0	+	-	-	-	+	+	+	-	+	0	-	-	+	+	0	0	0	+
Hungary	-	+	+	-	0	0	0	-	-	+	-	-	-	-	-	0	0	0	+	0	0	+
Ireland	0	+	-	0	-	+	+	+	-	-	-	+	-	+	+	+	-	-	-	-	-	-
Italy	-	-	+	0	0	0	+	+	-	0	0	0	0	-	0	0	0	0	+	0	-	-
Latvia	-	-	-	-	+	0	-	-	-	0	+	-	-	-	-	+	+	0	0	0	0	+
Lithuania	+	+	+	0	-	+	0	0	-	0	+	0	-	0	-	0	-	0	+	0	+	+
Luxembourg	-	-	+	0	-	0	0	0	0	+	-	-	+	+	+	+	+	0	0	-	0	0
Malta	+	-	+	0	-	+	-	-	0	-	+	+	+	0	-	0	+	0	-	0	-	-
Netherlands	-	-	0	+	0	0	0	0	0	0	0	0	-	-	0	0	0	0	+	0	0	0
Poland 1)	0	+	+	+	+	-	-	+	-	-	-	-	0	+	-	-	-	-	+	+	+	+
Portugal	0	+	-	+	+	0	+	+	+	-	+	0	+	+	0	0	-	0	-	0	0	0
Romania																						
Slovakia	-	+	+	+	-	+	-	-	+	-	-	-	+	0	+	-	0	-	0	+	+	+
Slovenia 1)	0	0	0	0	-	0	+	0	+	0	-	0	+	0	0	0	-	-	+	0	+	+
Spain	-	-	0	0	+	+	+	+	-	-	+	+	0	-	0	0	-	0	0	0	-	-
Sweden	0	+	0	+	-	0	+	-	0	0	-	0	-	+	+	0	+	0	+	0	-	+
United Kingdom	-	0	0	0	+	+	-	0	-	0	0	+	-	-	-	0	0	0	+	0	+	+
EU 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USA	+	+	0	-	-	0	+	+	-	0	+	0	+	+	0	0	-	0	-	-	0	+
Korea	+	+	+	0	0	-	-	+	-	-	-	-	0	+	+	0	-	-	0	-	+	+
Japan 1)	+	+	-	-	-	-	-	-	-	-	-	0	+	+	0	0	-	-	0	-	-	0
Switzerland																						
Group 1	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Group 2	-	-	0	0	+	+	+	+	0	0	0	+	0	0	0	0	0	0	0	0	-	-
Group 3	-	+	+	0	-	+	-	-	+	-	-	-	0	0	+	0	0	-	0	+	+	+
Group 4	+	+	0	0	+	+	+	0	-	0	+	0	-	0	-	0	+	0	0	0	+	+

Group 1: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Netherlands, Sweden, United Kingdom. - Group 2: Cyprus, Greece, Italy, Luxembourg, Portugal, Spain. - Group 3: Czech Republic, Hungary, Malta, Poland, Slovakia, Slovenia. - Group 4: Estonia, Latvia, Lithuania. - 1) 2006. - *) Total economy differential.

Source: OECD *(*STAN).

6. STRUCTURAL CHANGE AND COMPETITIVENESS: TESTING THE LINKS

The preceding chapter has established a set of descriptive indicators to monitor structural change. In this chapter we want to go one step further and econometrically test their economic significance for explaining competitiveness developments proxied by income levels and growth rates. Of course, we will have to interpret the results with caution, as on the one hand real-world relationships may be obfuscated by statistical requirements for significant relationships such as data availability, and on the other hand significant relationships may emerge as a statistical artefact out of our analysis. Nevertheless, we expect the assessment in this chapter to complement and refine our descriptive analysis from above as we have already established a thorough theoretical and empirical framework for the linkages between indicators of economic specialisation, structural change and competitiveness. This framework should guide and help us in interpreting the results from our econometric endeavour. We first proceed with both a graphical and a statistical analysis of correlations before we relate our indicators to levels and growth rates of GDP per capita.

6.1. Analysis of correlations

Examining the correlation patterns between GDP per capita as our proxy for competitiveness and our indicators as well as between the indicators themselves is a useful step before undertaking any econometric assessment. It will help us choosing a subset of indicators as well as add to the robustness of any interpretation.

Table 21 shows a range of descriptive statistics for our set of structural indicators, differentiating between indicators referring to manufacturing only and indicators referring to manufacturing and market services. In order to be able carry out regressions with the price segment indicators, we interpolated them between the three years of reference 1999, 2007 and 2009. Of course, the interpolation does not add any information which could be exploited to ascertain the relationship between the quality or price segment indicators and GDP per capita, but a longer time series is needed to make the overall regression robust. We also use an extended time series of the RVA LI and TDI indicators to be able to look at income levels and growth rates since 1985. As Table 21 makes clear, our observations cover quite different time spans which will affect the coefficients of our control variables. We will bear this in mind when comparing the results from different regressions.

Table 22 provides a cross-tabulation of correlations significant at the 10%-level, again differentiating between indicators referring to manufacturing only and indicators referring to manufacturing and market services. Correlations not significant at this level are omitted. The correlations are calculated pairwise, over the common time range of each variable pair. We have not included the firm demography indicators as only one or two years of available data is simply not enough for economic analysis; the productivity and energy intensity indicators are also not included as it is obvious from the descriptive analysis that data problems are too severe for them to be included in regressions. The arrows indicate whether the correlation is strongly positive or negative (vertical red and green arrows, from +/- 0.6 to +/-0.9), medium (diagonal yellow arrows, +/- 0.2 to +/- 0.5), or weak (horizontal arrows, +/- 0.1).

The table reads as follows: the first row shows the correlation of GDP per capita measured in power purchasing parities with the set of indicators reported in the columns. Each following row then shows the correlation of an indicator with all the other indicators in the columns. After GDP, we first show for consistency the country group variable, which takes a value from 1 to 4. Country group 1 corresponds to the countries with knowledge-intensive structures and high GDP per capita levels, group 4 to catching-up countries with less knowledge-intensive structures. Then we show the so-called “within” indicators, the R&D

country effect and the export shares by price segment. This is followed by the "between" indicators RCA revealed comparative advantage for trade and RVA relative value added for value added indicators. For RCA and RVA we have included the two 2-digit taxonomies related to the educational and innovation intensity of sectors to cover both manufacturing and services, and the 3-digit taxonomy on factor inputs to cover manufacturing only at a more detailed level. We focus on the "high" and "low" end of indicators, i.e. labour-intensive vs. technology-driven in the case of the factor-input taxonomy and high resp. low innovation or education intensity. For the R&D country effect we also report its value for high and low innovation intensity sectors. In addition, we report the RVA of the sectors which are both labour intensive and feature low skill intensity (LI&LS). At the end, we report the indicators referring to the share of exports going to the BRIC countries by industry type (labour-intensive and technology-driven).

Looking at the first row, we can see that GDP per capita is significantly correlated, either positively or negatively, with all of the structural indicators reported. The correlation with country groups is negative as country group 4 is the group with the lowest levels of GDP per capita. The highest positive correlations are displayed by the share of exports in the high price segment of labour-intensive and technology-driven industries, and by the RCA and the RVA of sectors showing high educational intensities. The highest negative correlations are displayed by the share of exports in the low price segment of labour-intensive and technology-driven industries, by the RCA of EDU low and labour-intensive industries and by the RVA of INNO low industries.

Looking at the correlation between structural indicators, they are rather highly – positively or negatively – correlated with indicators of their "class", i.e. the different RVA, RCA and price segment indicators are quite similar; they are also rather highly correlated with other classes of indicators, with the exception of the R&D country effect indicators. We will take account of these correlations by paying attention to entering structural indicators preferably individually in the regressions, to minimise any issue of multicollinearity.

As a last data screening device, we present a scatterplot for each class of indicators including a linear trend to graphically assess the quality of our data in Figure 26. The RVA data at the 3-digit manufacturing level seem to be well balanced, the outlier featuring high GDP per capita and low RVA should not matter given the number of observations. The RCA data also show considerable variation, if somewhat concentrated at the top and at the bottom of the distribution. The data points combining low or medium GDP per capital levels with high RCA TDI levels refer to the catching-up countries of group 3. From the low price segment-GDP per capita scatterplot we can easily see that the data have been linearly interpolated. The scatterplot of the R&D country effect in sectors characterised by low innovative activity clearly spells trouble for our econometric investigations, as there is little variation dominated by a few outliers.

The other indicators feature similar data patterns to the ones presented here, with the exception of the RCA EDU high, where the presence of a few strong outliers with very high GDP and very high RCA values will make us prudent in interpreting the regression results.

Table 21: Descriptive Statistics: GDP per capita and set of structural change indicators

Variable	Observations	Mean	Std.Dev.	Min	Max	Countries	Years
			Manufacturing				
RVA LI&LS	360	1.13	0.77	0.14	3.61	21	1985-2007
RVA LI	358	1.01	0.34	0.00	2.38	21	1985-2007
RVA TDI	357	0.77	0.31	0.00	1.50	21	1985-2007
RCA LI	336	1.46	0.93	0.13	4.84	27	1999-2010
RCA TDI	336	0.88	0.44	0.12	2.10	27	1999-2010
High Price Segment LI	297	27.63	16.78	1.93	78.90	27	1999-2009
High Price Segment TDI	297	40.23	19.87	3.00	80.45	27	1999-2009
Low Price Segment LI	297	36.84	20.07	2.04	88.12	25	1999-2009
Low Price Segment TDI	297	24.50	17.48	2.00	75.71	25	1999-2009
BRIC LI	336	0.48	0.51	0.01	2.96	27	1999-2010
BRIC TDI	336	1.34	1.19	0.04	7.21	27	1999-2010
			M&Services				
RDCE	360	-0.43	0.85	-3.46	2.21	26	1998-2007
RDCE Inno High	360	-0.13	0.51	-1.47	2.27	26	1998-2007
RDCE Inno Low	360	0.00	0.04	-0.06	0.27	26	1998-2007
RCA Edu High	134	0.96	1.02	0.16	5.25	21	2004-2009
RCA Edu Low	134	1.20	0.39	0.53	2.37	21	2004-2009
RCA Inno High	138	0.89	0.34	0.28	1.90	21	2004-2009
RCA Inno Low	138	1.60	1.15	0.21	4.68	21	2004-2009
RVA Edu High	198	0.74	0.23	0.31	1.51	21	1999-2007
RVA Edu Low	198	1.10	0.20	0.76	1.74	21	1999-2007
RVA Inno High	198	0.84	0.41	0.11	1.86	21	1999-2007
RVA Inno Low	198	1.18	0.28	0.55	1.99	21	1999-2007

Number of countries refers to the number of EU countries used in the regressions. RDCE = R&D Country Effect, LI = Labour Intensive, TDI = Technology Driven Industries, LS = Low Skill, RCA = Revealed Comparative Advantage, RVA = Relative Value Added.

Source: Eurostat, OECD, EU KLEMS, own calculation.

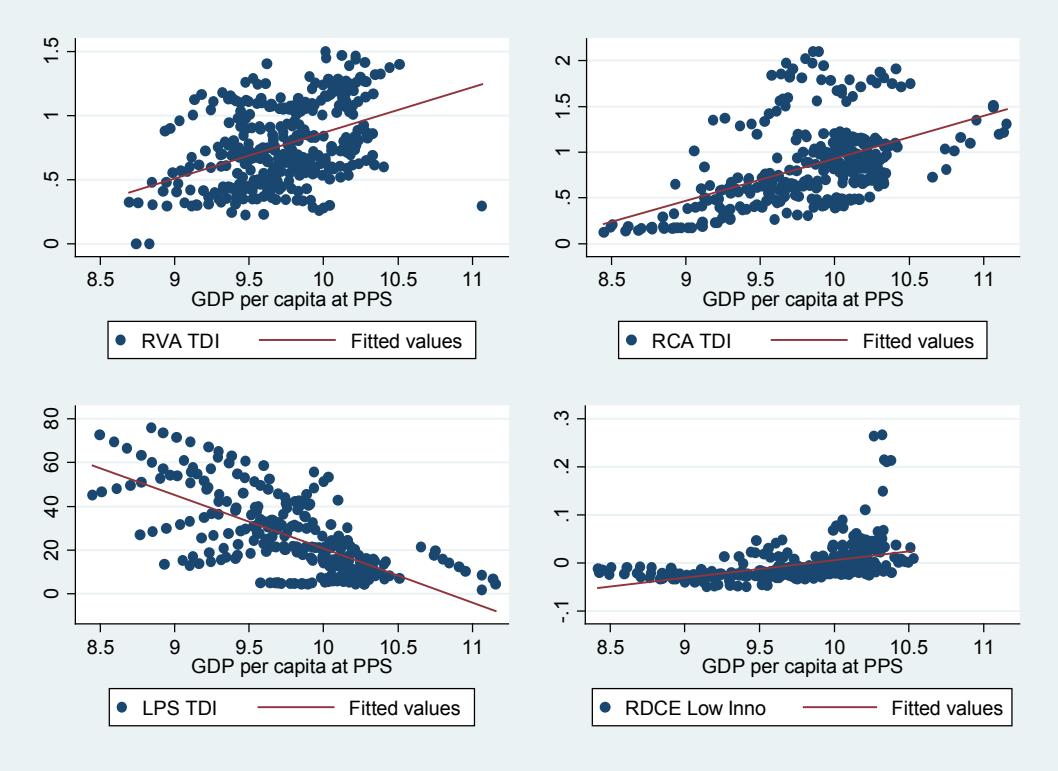
Table 22: Analysis of correlations: GDP per capita and set of structural change indicators

	GDP per capita	Country Group	**Manufacturing**	RVA LI&LS	RVA LI	RVA TDI	High Price Segment LI	High Price Segment TDI	Low Price Segment LI	Low Price Segment TDI	BRIC LI	BRIC TDI	RCA LI	RCA TDI	**M& Services**	RDCE	RDCE Inno High	RDCE Inno Low	RCA Edu High	RCA Edu Low	RCA Inno High	RCA Inno Low	RVA Edu High	RVA Edu Low	RVA Inno High	RVA Inno Low
GDP per capita		↓ 0.6		↘ 0.4	↘ 0.2	↗ 0.4	↑ 0.7	↑ 0.7	↓ 0.7	↓ 0.7	↘ 0.2	→ 0.1	↓ 0.8	↗ 0.5		↗ 0.5	↗ 0.4	↗ 0.4	↑ 0.7	↓ 0.7	↗ 0.2	↘ 0.5	↑ 0.8	↘ 0.2	↗ 0.3	↓ 0.6
Country Group	↓ 0.6			↑ 0.7	↗ 0.5	↘ 0.5	↓ 0.7	↓ 0.7	↑ 0.8	↑ 0.7	↑ 0.4		↑ 0.7	↘ 0.4		↘ 0.5	↘ 0.4	↘ 0.4	↘ 0.3	↗ 0.5	↘ 0.3	↗ 0.3	↓ 0.7	↗ 0.4	↘ 0.4	↑ 0.6
Manufacturing																										
RVA LI&LS	↘ 0.4	↑ 0.7			↑ 0.8	↓ 0.6	↘ 0.5	↓ 0.7	↗ 0.5	↑ 0.7	↗ 0.3		↑ 0.8	↓ 0.6		↘ 0.3	↘ 0.2	↘ 0.3	↘ 0.4	↑ 0.8	↘ 0.4	↗ 0.4	↓ 0.6	↑ 0.7	↓ 0.6	↗ 0.5
RVA LI	↘ 0.2	↗ 0.5		↑ 0.8		↓ 0.5	↘ 0.5	↓ 0.6	↗ 0.5	↑ 0.6	↑ 0.5		↑ 0.9	↓ 0.7				→ 0.1	↘ 0.4	↑ 0.8	↓ 0.6	↗ 0.5	↓ 0.6	↑ 0.7	↓ 0.5	↑ 0.6
RVA TDI	↗ 0.4	↘ 0.5		↓ 0.6	↓ 0.5		↗ 0.4	↑ 0.6	↓ 0.5	↓ 0.5	↓ 0.4	↗ 0.2	↓ 0.7	↑ 0.7				→ 0.1		↓ 0.6	↗ 0.5	↘ 0.4	↗ 0.5	↓ 0.7	↑ 0.8	↓ 0.7
High Price Segment LI	↑ 0.7	↓ 0.7		↘ 0.5	↘ 0.5	↗ 0.4		↑ 0.6	↓ 0.8	↓ 0.6	↓ 0.3		↓ 0.7	↑ 0.6				↗ 0.4	↗ 0.4	↓ 0.5	↗ 0.2	↘ 0.3	↑ 0.6	↘ 0.2	↗ 0.3	↓ 0.6
High Price Segment TDI	↑ 0.7	↓ 0.7		↓ 0.7	↓ 0.6	↑ 0.6	↑ 0.6		↓ 0.6	↓ 0.8	↘ 0.2	→ 0.1	↓ 0.6	↑ 0.6		↗ 0.3	→ 0.2	↗ 0.3	↗ 0.4	↘ 0.5	↗ 0.2	↘ 0.2	↑ 0.6	↘ 0.5	↗ 0.5	↘ 0.5
Low Price Segment LI	↓ 0.7	↑ 0.8		↗ 0.5	↗ 0.5	↓ 0.5	↓ 0.8	↓ 0.6		↑ 0.7	↗ 0.3		↑ 0.7	↓ 0.5		↘ 0.3	↘ 0.2	↘ 0.5	→ 0.1	↑ 0.6	↘ 0.5	↗ 0.4	↓ 0.6	↗ 0.3	↓ 0.5	↑ 0.6
Low Price Segment TDI	↓ 0.7	↑ 0.7		↑ 0.7	↑ 0.6	↓ 0.5	↓ 0.6	↓ 0.8	↑ 0.7		↗ 0.2		↑ 0.6	↓ 0.5		↘ 0.4	↘ 0.3	↘ 0.3	↘ 0.4	↗ 0.5	↘ 0.3	↗ 0.3	↓ 0.5	↗ 0.4	↘ 0.3	↗ 0.4
BRIC LI	↘ 0.2	↑ 0.4		↗ 0.3	↑ 0.5	↓ 0.4	↓ 0.3	↘ 0.2	↑ 0.3	↗ 0.2		↗ 0.3	↑ 0.5	↓ 0.5			↗ 0.1	↘ 0.3	↓ 0.4	↑ 0.3	↘ 0.3	↗ 0.2	↓ 0.4	↗ 0.1	↓ 0.3	↑ 0.5
BRIC TDI	→ 0.1				↗ 0.2			↗ 0.1			↗ 0.3		↘ 0.1	↗ 0.2		↗ 0.2	↗ 0.1		↘ 0.2	↓ 0.3	↗ 0.3	↘ 0.2	↘ 0.2	↘ 0.2	↑ 0.3	
RCA LI	↓ 0.8	↑ 0.7		↑ 0.8	↑ 0.9	↓ 0.7	↓ 0.7	↓ 0.6	↑ 0.7	↑ 0.6	↑ 0.5	↘ 0.1		↓ 0.8		→ 0.1		↘ 0.4	↓ 0.5	↑ 0.7	↘ 0.4	↑ 0.5	↓ 0.7	↗ 0.3	↘ 0.5	↑ 0.8
RCA TDI	↗ 0.5	↘ 0.4		↓ 0.6	↓ 0.7	↑ 0.7	↑ 0.6	↑ 0.6	↓ 0.5	↓ 0.5	↓ 0.5	→ 0.1	↓ 0.8			↘ 0.1	↘ 0.3	↗ 0.2	↑ 0.6	↓ 0.7	↗ 0.4	↘ 0.4	↗ 0.5	↘ 0.3	↗ 0.4	↓ 0.7
M&Services																										
RDCE	↗ 0.5	↘ 0.5		↘ 0.3				↗ 0.3	↘ 0.3	↘ 0.4		↗ 0.2	→ 0.1	↘ 0.1			↑ 0.9	↗ 0.3	↗ 0.3	↘ 0.2			↗ 0.3			
RDCE Inno High	↗ 0.4	↘ 0.4		↘ 0.2				→ 0.2	↘ 0.2	↘ 0.3	→ 0.1	→ 0.1				↑ 0.9		↗ 0.3	↗ 0.3		↘ 0.4	→ 0.2	↗ 0.3		↘ 0.2	→ 0.2
RDCE Inno Low	↗ 0.4	↘ 0.4		↘ 0.3	→ 0.1	→ 0.1	↗ 0.4	↗ 0.3	↘ 0.5	↘ 0.3	↓ 0.3		↘ 0.4	↗ 0.2		↗ 0.3	↗ 0.3			↘ 0.3	↗ 0.3		↗ 0.5	↘ 0.2	↗ 0.2	
RCA Edu High	↑ 0.7	↘ 0.3		↘ 0.4	↘ 0.4		↗ 0.4	↗ 0.4	→ 0.1	↘ 0.4	↓ 0.4	↘ 0.2	↓ 0.5	↑ 0.6		↗ 0.3	↗ 0.3			↘ 0.5		↘ 0.2	↑ 0.7			↘ 0.3
RCA Edu Low	↓ 0.7	↗ 0.5		↑ 0.8	↑ 0.8	↓ 0.6	↓ 0.5	↘ 0.5	↑ 0.6	↗ 0.5	↗ 0.3	↓ 0.3	↑ 0.7	↓ 0.7		↘ 0.2		↘ 0.3	↘ 0.5		↓ 0.6	↑ 0.6	↓ 0.7	↑ 0.7	↓ 0.6	↑ 0.6
RCA Inno High	↗ 0.2	↘ 0.3		↘ 0.4	↓ 0.6	↗ 0.5	↗ 0.2	↗ 0.2	↘ 0.5	↘ 0.3	↘ 0.3	↗ 0.3	↘ 0.4	↗ 0.4			↘ 0.4	↗ 0.3		↓ 0.6		↓ 0.6	↗ 0.2	↓ 0.6	↑ 0.8	↘ 0.5
RCA Inno Low	↘ 0.5	↗ 0.3		↗ 0.4	↗ 0.5	↘ 0.4	↘ 0.3	↘ 0.2	↗ 0.4	↗ 0.3	↗ 0.2	↘ 0.2	↑ 0.5	↘ 0.4			→ 0.2		↘ 0.2	↑ 0.6	↓ 0.6		↓ 0.5	↗ 0.5	↓ 0.6	↑ 0.6
RVA Edu High	↑ 0.8	↓ 0.7		↓ 0.6	↓ 0.6	↗ 0.5	↑ 0.6	↑ 0.6	↓ 0.6	↓ 0.5	↓ 0.4	↘ 0.2	↓ 0.7	↗ 0.5		↗ 0.3	↗ 0.3	↗ 0.5	↑ 0.7	↓ 0.7	↗ 0.2	↓ 0.5		↘ 0.5	↗ 0.3	↘ 0.5
RVA Edu Low	↘ 0.2	↗ 0.4		↑ 0.7	↑ 0.7	↓ 0.7	↘ 0.2	↘ 0.5	↗ 0.3	↗ 0.4	→ 0.1	↘ 0.2	↗ 0.3	↘ 0.3				↘ 0.2		↑ 0.7	↓ 0.6	↗ 0.5	↘ 0.5		↓ 0.6	↗ 0.3
RVA Inno High	↗ 0.3	↘ 0.4		↓ 0.6	↓ 0.5	↑ 0.8	↗ 0.3	↗ 0.5	↓ 0.5	↘ 0.3	↓ 0.3	↗ 0.3	↘ 0.5	↗ 0.4			↘ 0.2	↗ 0.2		↓ 0.6	↑ 0.8	↓ 0.6	↗ 0.3	↓ 0.6		↓ 0.7
RVA Inno Low	↓ 0.6	↑ 0.6		↗ 0.5	↑ 0.6	↓ 0.7	↓ 0.6	↘ 0.5	↑ 0.6	↗ 0.4	↑ 0.5		↑ 0.8	↓ 0.7			→ 0.2		↘ 0.3	↑ 0.6	↘ 0.5	↑ 0.6	↘ 0.5	↗ 0.3	↓ 0.7	

Only correlations at the 10%-level are reported. RDCE = R&D Country Effect, LI = Labour Intensive, TDI = Technology Driven Industries, LS = Low Skill, RCA = Revealed Comparative Advantage, RVA = Relative Value Added.

Source: Eurostat, OECD, EU KLEMS, own calculation.

Figure 26: Data scatterplots with linear trend for selected structural indicators



RDCE = R&D Country Effect, TDI = Technology Driven Industries, RCA = Revealed Comparative Advantage, RVA = Relative Value Added, LPS = Low Price Segment.

Source: Eurostat, OECD, own calculation.

6.2. Econometric assessment

Basically, we want to know whether levels of significance from the correlations above carry over when we control for a set of variables known to be important for income levels and growth; and we want to gain information on the order of magnitude with which changes in the indicators affect changes in GDP per capita. From this, we would then be able to conclude if in general structural change and economic specialisation are significantly associated with competitiveness and we would be able to refine our proposed set of indicators for monitoring structural change.

We start with a reminder of the literature on the empirics of economic growth. The general conundrum in that field is that many factors may affect growth patterns and that over time growth factors may change according to the development of a country (see Aghion - Howitt, 2006). In a large enough sample, the coefficients of all the insignificant variables would tend to zero. However, in cross-country growth regressions there are typically not enough observations (Sala-i-Martin - Doppelhofer - Miller, 2004). Hence, it is almost impossible to include all the relevant variables and a choice will have to be made. The necessarily limited set of explanatory variables does not automatically mean that the inclusion of more variables

would lead to very different results, as estimation methods are available which limit or reduce any bias resulting from omitted variables (see below).

The rich literature so far has found inter alia a core set of variables affecting economic growth that include initial GDP per capita, the investment rate (or the relative price of investment), population growth, human capital, R&D expenditure ratios and openness (Aiginger - Falk, 2005, Sala-I-Martin, 1997; Sala-i-Martin - Doppelhofer - Miller, 2004). The existing proxies for human capital such as years of schooling are known to be weak as they lack information on the quality of education or on the cognitive skills actually formed in the process of education (Hanushek - Woessmann, 2008). It comes as no surprise then that years of schooling often turns out to be insignificant or even significantly negative (Bond - Hoeffler - Temple, 2001, Aiginger - Falk, 2005). Beyond this core set of variables many more have been studied in association with economic growth, such as financial development, political stability and regime, corruption, etc. As stated above, this is usually done by combining the core set of explanatory variables with a few variables of particular interest, a valid strategy as omitted variables bias can be dealt with to some extent, e.g. by controlling for country fixed effects.

Focusing on indicators of structural change or economic specialisation as an explanatory variable for economic growth or income levels, we recall from our literature survey at the beginning of this report the various links between structural change or economic specialisation and income levels as well as growth, drawing in particular from Peneder (2003, page 428f.).

- Most broadly, structural indicators may be interpreted as proxies for firm capabilities which in turn determine competitiveness. Even though there is considerable firm heterogeneity within sectors, firms usually need certain competencies or production factors to be able to produce a particular good and/or service. In turn it is these very goods/services that define to which sector a firm statistically belongs. Put differently, the requirements for firm competitiveness differ to a certain extent by sector. E.g., specialisations of a country in sectors that are usually characterised by high innovative activity indicate that firms in this country are capable of engaging in innovative activity.
- Industries differ in their typical propensity to undertake investments such as R&D and adverising to expand demand by creating new markets or increasing the consumers' willingness to pay for already established products and services. Provided that technological opportunities exist and that customers are receptive to new products, differential growth at the industry level may become a consequence of firms' competitive strategies. For each economy, a higher share of such 'entrepreneurial' types of industry would then also imply a larger overall capacity to generate income and growth.
- Industrial structure has an apparent impact on the aggregate economy if industries differ in their generation of exernal effects – R&D intensive industries such as electronics may create more knowledge also relevant for other parts of the economy than sectors relying mainly on non-R&D innovation modes such as textiles. These so-called producer related spillovers may be facilitated by spatial proximity.

This conceptual framework has been empirically substantiated by several papers. Fagerberg (2000) finds that countries that have managed to increase their presence in the technologically most progressive industry of the period under review (electronics) have experienced higher productivity growth than other countries. Peneder (2003) finds that the export share of technology-driven and high-skill-intensive industries has a positive and significant impact on the level and growth of GDP per capita. Using panel data for OECD and non-OECD countries, Wörz (2005) finds that the share of medium-high-skill-intensive exports is positively associated with GDP growth, while the share of low-skill-intensive exports shows the expected negative effect. Aiginger – Falk (2005) find that the share of high-technology exports is significantly positively related to GDP per capita.

The cited studies have usually chosen trade indicators in the context of OECD countries as these are readily available for a longer time span.[7] We complement the existing studies by investigating a broader set of structural indicators in the context of EU countries, among them indicators of relative valued added and export quality, made possible by our efforts at constructing a comprehensive set of indicators for as many countries and years possible. As our time series are also more recent than most of the other studies, we will also be able to check whether structural change and economic specialisation are still relevant growth factors or whether they belong to those factors which lose importance as countries approach the efficiency frontier.[8] The theoretical grounding and the empirical evidence so far provide an unequivocal justification for including indicators of structural change and economic specialisation in a set of variables aimed at explaining economic growth and income levels. We first start with an analysis of the determinants of income levels before we turn to growth rates. In general, we expect similar results for income levels and growth, but some results may differ as countries with above-average levels of GDP tend to have lower growth rates and vice versa. Hence, investigating both income levels and growth rates allows for examining any differences in competitiveness drivers of countries with high GPD per capita and countries which are catching up. Such differences are the subject of a recent literature viewing determinants of growth as factors changing with income levels (Acemoglu - Aghion - Zilibotti, 2006, or Aghion – Howitt, 2005, cited above).

- Income levels

To estimate the relationship between GDP per capita levels at power purchasing parity and our various indicators we build on Peneder (2003). We use a fixed effects panel regression of the form

$$\ln(y_{i,t}) = \alpha + \beta_1 \ln POP_{i,t} + \beta_2 \ln POPWA_{i,t} + \beta_3 EMR_{i,t} + \beta_4 EMR_{i,t-1} + \beta_5 \ln INV_{i,t-1} + \beta_6 \ln EDU_{i,t-1} + \beta_7 X_{i,t-1} + \eta_t + \mu_i + \varepsilon_{i,t}$$

[7] With the exception of Fagerberg (2000) who uses the employment share of industries as an indicator.
[8] We implement this however only by looking at different time periods, rather than by implementing an econometric framework allowing for varying coefficients in function of the distance to the frontier.

where $y_{i,t}$ is the dependent variable GDP per capita for country i at year t. We have included a set of core control variables which emerge as significant in many empirical growth studies (see above). Population size (POP) and population size at working age were included as a means of evaluating the influence of demographic changes in the population of a country. Ceteris paribus, GDP per capita falls when the population grows; therefore, the expected sign of the coefficient β_1 is negative. In contrast, if the general size of the population is taken into consideration, a larger fraction of the population at working age is expected to have a positive impact on overall productive capacity, increasing overall GDP. Thus we expect β_2 to be positive.

Following Peneder (2003) we use the employment rate (EMR) to check for country specific differences in the business cycle. While the employment rate may certainly be influenced by factors other than the business cycle such as changes in retirement regulations, the alternative of the output gap has also been shown to be facing serious problems as it is basically not observable and a statistical construct. Given our wide range of EU member states and the differing quality of output gap time series data for the Member States, we prefer the employment rate which is readily observable. The regression also includes the time dummies η_t, which enable us to control for global business cycle effects. As labour productivity should develop in a procyclical manner, we expect β_3 to be positive. The opposite applies to the lagged employment rate (EMR_{t-1}), for which a higher value of β_4 signals tighter labour markets. Investment in physical capital (INV) is captured by the lagged value of total investments in the previous year. All the preceding control variables are taken from the AMECO database from the European Commission. Human capital is – weakly, as we discussed above - proxied by average years of schooling, taken from the World Bank website.

After this core set of classic growth variables we introduce our structural indicators. R&D is missing as a global control variable because we use the R&D country effect. As we are concerned with multicollinearity and face different number of years and countries by indicator, we enter them individually rather than several at a time. In order to mitigate problems of endogeneity, all the structural variables are entered as lagged values ($_{t-1}$); the detail of indicator construction is in the technical appendix to this report. Country fixed effects μ_i – i.e. unobserved heterogeneity – are eliminated by the fixed effects panel data estimator, reducing omitted variable bias.

We run the regressions for all the variables reported in Table 22 and Table 21, controlling also for outliers. Tables 23a-c report the results of our regressions, guided by our analysis of correlations. The first column shows the results of the regression without any structural indicators for a larger range of countries and years. This is our “benchmark”. We do not report the results for education as it was unsurprisingly never significant. The next columns report the coefficients and levels of significance for the control variables and then the structural indicators. The signs of the control variables work in all specifications as expected; they are almost always significant with the exception of regression specifications with a short time span. The magnitude of coefficients is rather stable taking account of the varying number of years and countries across indicators. We take this as a sign of the robustness of our overall

framework to explain income levels. Regarding the structural indicators, all have the expected signs with the exception of the RVA in labour intensive industries, which is however insignificant. The levels of significance mostly match our expectations from our earlier descriptive analysis. We first examine our between indicators before we turn to the "within"-indicators.

"Between"-indicators: RVA, RCA and share of exports to BRIC countries

We start with indicators at the 3-digit NACE level, meaning that we look at manufacturing only (table 23a). We are not surprised to find that the RVA of technology-driven industries significantly affects GDP per capita levels, judging from our earlier analysis in chapter 5 and the analysis of the data above. Taking its coefficient at face value, an increase by one unit in the RVA TDI relative to the value of the other countries would increase GDP per capita by 5% in the long run. We are surprised to see that the RVA of labour intensive and low-skill industries is not significant, but not that the RVA of labour intensive industries is not significant (and shows the wrong sign), as there are a couple of countries featuring specialisation in labour-intensive industries at the same time as above-average levels of GDP per capita (basically, the countries of group 2).

Turning to the trade indicators, consistent with our scepticism in chapter 5 the RCA of technology-driven industries is insignificant: quite a number of countries achieve trade specialisation in technology-driven industries while featuring below-average levels of GDP per capita (e.g., countries of group 3), mainly because they specialise in the production related parts of the value chain rather than its research- and innovation-related segments. The RCA of labour intensive industries is also insignificant while showing the expected negative sign. The share of exports to the BRIC countries in either technology-driven or labour-intensive industries was not significant.

We now turn to our indicators based on our taxonomies at the 2-digit level of the NACE classification which include manufacturing and services (table 23b). It is important to remember that while the RVA at the 2-digit level comes from the same database (Eurostat SBS) and is just a higher aggregation of the available data including services sectors, the RCA at the 2-digit level is a combination of the COMEXT database focusing on manufacturing and of the balance of payments database (BOP), combined for the first time by WIFO to enable an analysis of trade competitiveness not just for manufacturing but for the overall economy.

To contrast both RVA and RCA at the 2-digit level briefly, while showing the expected sign, none of the RVA indicators is significant while 3 out of 4 RCA indicators are highly significant. Hence, when we include services, the explanatory power of trade indicators is superior to value added indicators, as opposed to manufacturing only. This is most likely the case because countries may feature high shares of services in sectors classified as highly innovative or educationally intensive without being internationally competitive.[9] Only the

[9] We may also see here the effect of Baumol's hypothesis (1967) that a growing service sector may ultimately hold back competitiveness because of slower productivity growth. The results of our study seem to indicate that the performance effect depends on the performance and sophistication of these services as proxied by their export structure.

information in the RCA on the amount of services which actually meet the test of international markets is significantly associated with income levels. As opposed to manufacturing, in services we face much less the problem of internationally fragmented value chains which render RCA indicators for manufacturing fragile. On the contrary, indicators on which kind of services countries export, as measured by intensity levels of innovation and education, are closely associated with income levels.

In detail, the RCA of educationally not intensive industries is highly significant. An increase by one unit relative to the value of the other countries would reduce GDP per capita by 16% in the long run. This magnitude should not be overinterpreted however as it partly results from the short time span examined. Recall that our RCA EDU and INNO indicators are only available from 2004 to 2009, while the RVA indicators are available from 1999 to 2007. As a consequence, we need of course to be careful when drawing lessons from this exercise, as longer time series need to confirm our results achieved over the short time span available. The RCA INNO high indicator is significant at the 5% level. An increase by one unit relative to the value of the other countries would increase GDP per capita by 13% in the long run. The RCA INNO low indicator is highly significant at the 1% level, displaying a coefficient of -0.056.

"Within"-indicators: export quality and R&D country effect

Our price segment- or quality indicators are constructed at the 3-digit NACE level. The share of exports in both the low price segment and the high price segment of labour-intensive industries are highly significant and show the expected sign. Ten additional percentage points of export in the low price segment reduces income levels by 3%, ten additional percentage points of export in the high price segment of labour-intensive industries increases income levels by 2%. This is also a strong confirmation of the conclusions of chapter 5, that high shares of labour-intensive industries may be compatible with high income levels as long as the countries move towards the top of the quality ladder in these industries. The same indicators in the technology-driven industries are both insignificant. We do not know whether this is a result of our imperfect data (only three years were calculated due to the complexity of the calculation) or whether it is easier in technology-driven industries to be successful with both quality and/or price strategies.

The results for the R&D country effect are mixed. While the total R&D country effect shows the expected sign, it is insignificant. The R&D country effect in sectors characterised by low innovative activity is significant at the 5% level. An additional percentage point would increase GPD per capita levels by 13%. We could interpret this in such a way that countries which achieve high R&D intensity in low innovation sectors are competitive, similar to the meaning of the quality indicators in the labour-intensive industries: when your low innovation sectors feature above-average R&D intensity, it is possible to sustain high income levels. However, from the graphical inspection above, we know that our result could also be a statistical artefact, hence we need to be careful in interpreting this indicator, even when its result fits well into the overall framework: as for the quality indicator in technology-driven industries, the R&D country effect in high innovation sectors is showing the wrong sign.

Table 23a: Regressions results for GDP per Capita levels: "between"-indicators, manufacturing only (3-digit NACE level)

Fixed Effects Panel Estimator

	(1)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Population	-3.2634***	-3.2152***	-3.2306***	-3.2137***	-3.2379***	-3.2521***	-3.3952***	-3.4225***
Population 15-64	2.5782***	2.6633***	2.7981***	2.6894***	2.1304***	2.2423**	2.3680***	2.3809***
Employment	0.0098***	0.0157***	0.0163***	0.0164***	0.0053	0.0058	0.0053	0.0052
Lagged Employment	-0.0061*	-0.0076*	-0.0095**	-0.0088**	-0.0068*	-0.0074*	-0.0071**	-0.0068**
Lagged Investment	0.2829***	0.1810***	0.1912***	0.1984***	0.2797***	0.2787***	0.2816***	0.2826***
Lagged RVA LI&LS		-0.0394						
Lagged RVA LI			0.0308					
Lagged RVA TDI				0.0504**				
Lagged RCA LI					-0.0298			
Lagged RCA TDI						0.0127		
Lagged BRIC LI							0.0066	
Lagged BRIC TDI								0.0042
Constant	8.5073***	14.7011***	13.6182***	14.3527***	19.9512***	19.1633***	19.3444***	19.4611***
Observations	534	346	344	343	297	297	297	297
R-squared	0.9774	0.9874	0.9866	0.9867	0.9459	0.9456	0.9454	0.9456
Number of countries	31	22	22	22	27	27	27	27

LI = Labour Intensive, TDI = Technology Driven Industries, LS = Low Skill, RCA = Revealed Comparative Advantage, RVA = Relative Value Added, BRIC = Brazil, Russia, India, China. All equations contain time dummies.
*** p<0.01, ** p<0.05, * p<0.1

Table 23b: Regressions results for GDP per Capita levels, "between"-indicators, manufacturing and services combined (2-digit NACE level)

Fixed Effects Panel Estimator

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Population	-3.0479**	-2.3107**	-2.7627***	-2.7548**	-3.7850***	-3.7026**	-3.7002***	-3.7709***
Population 15-64	2.0123	1.3952	2.1076**	2.3200**	2.7812**	2.7687**	2.7926**	2.8289**
Employment	0.0051	0.0076**	0.0048*	0.0088***	0.0161***	0.0151***	0.0148***	0.0150***
Lagged Employment	-0.0050	-0.0040	-0.0056**	-0.0051**	-0.0058	-0.0065*	-0.0064	-0.0067
Lagged Investment	0.2294***	0.1645**	0.2297***	0.1379**	0.1903**	0.2157**	0.2142**	0.2084**
Lagged RCA Edu High	0.0351							
Lagged RCA Edu Low		-0.1616***						
Lagged RCA Inno High			0.1352**					
Lagged RCA Inno Low				-0.0562***				
Lagged RVA Edu High					0.1159			
Lagged RVA Edu Low						-0.0178		
Lagged RVA Inno High							0.0285	
Lagged RVA Inno Low								-0.0155
Constant	19.3736***	18.2417***	15.8620***	14.1671***	18.4297***	17.9417***	17.6868***	18.0723***
Observations	128	128	132	132	198	198	198	198
R-squared	0.8917	0.9100	0.8974	0.9019	0.9595	0.9576	0.9578	0.9576
Number of cou	23	23	25	25	22	22	22	22

LI = Labour Intensive, TDI = Technology Driven Industries, LS = Low Skill, RCA = Revealed Comparative Advantage, RVA = Relative Value Added, BRIC = Brazil, Russia, India, China. All equations contain time dummies.

*** p<0.01, ** p<0.05, * p<0.1

Table 23c: Regressions results for GDP per Capita levels, "within"- indicators

Fixed Effects Panel Estimator

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Population	-3.5414***	-3.6436***	-3.0394***	-3.5532***	-3.8147***	-3.6536***	-3.7513***
Population 15-64	2.4150***	2.6535***	2.1016***	2.4956***	2.5546***	2.4585***	2.5223***
Employment	0.0059*	0.0051	0.0078**	0.0052	0.0081*	0.0081*	0.0081*
Lagged Employment	-0.0076**	-0.0046	-0.0084***	-0.0060*	-0.0082***	-0.0081***	-0.0084***
Lagged Investment	0.2654***	0.2669***	0.2228***	0.2723***	0.2692***	0.2725***	0.2713***
Lagged High Price Segment LI	0.0020***						
Lagged High Price Segment TDI		-0.0014					
Lagged Low Price Segment LI			-0.0031***				
Lagged Low Price Segment TDI				0.0009			
Lagged RDCE					0.0047		
Lagged RDCE Inno High						-0.0234	
Lagged RDCE Inno Low							0.1324**
Constant	20.1253***	18.9703***	18.5642***	19.4958***	21.8668***	21.2029***	21.5710***
Observations	286	286	286	286	297	297	297
R-squared	0.9496	0.9467	0.9548	0.9458	0.9579	0.9582	0.9583
Number of cou	26	26	26	26	29	29	29

LI = Labour Intensive, TDI = Technology Driven Industries, RDCE = R&D Country Effect. All equations contain time dummies.

*** p<0.01, ** p<0.05, * p<0.1

- Growth rates

To estimate the links between our structural indicators and growth rates of GDP per capita we employ a dynamic panel data set-up, i.e. we include lagged GDP per capita levels (at *t-1*) among the explanatory variables on the right hand side of the growth equation, as is common in the literature to account for effects of conditional convergence to steady-state levels of GDP per capita. We depart from Peneder's (2003) approach in using the system GMM (Generalised Method of Moments) estimator developed by Blundell - Bond (1998) and recommended by Bond et al. (2001) for use in empirical growth regressions. In comparison with the first-differenced GMM estimator employed by Peneder (2003), the system GMM estimator exploits an additional moment condition based on assumptions which are very plausible to be met in an empirical growth framework: it combines the standard set of equations in first-differences with suitably lagged levels as instruments – as in the first-differenced GMM estimator - with an additional set of equations in levels with suitably lagged first-differences as instruments. Employing these instrumental variables, the system GMM estimator deals well with issues of endogeneity which are pervasive in growth regressions, omitted variable bias[10] and measurement error.

As a consequence, the system GMM estimator leads to more precise and consistent estimates even when the when the time series are persistent – as is the case with many of our structural indicators – and when the number of time series observations is small, as is the case with some of our indicators (e.g. the RCA EDU and INNO measures).

Our equation takes the form:

$$\ln(y_{i,t}) = \beta_1 \ln(y_{i,t-1}) + \beta_j (Z_{i,t}) + \beta_k (X_{i,t}) + \eta_t + \mu_i + \varepsilon_{i,t}$$

First differencing eliminates the country fixed effect μ_i and leads to

$$\ln(y_{i,t}) - \ln(y_{i,t-1}) = \beta_1(\ln(y_{i,t-1}) - \ln(y_{i,t-2}) + \beta_j (Z_{i,t} - Z_{i,t-1}) + \beta_k (X_{i,t} - X_{i,t-1}) + \eta_t + (\varepsilon_{i,t} - \varepsilon_{i,t-1})$$

For brevity we choose the notation of $Z_{i,t}$ to denote our set of control variables and $X_{i,t}$ to refer our set of structural indicators. There is no need to enter lagged values of variables (with the exception of lagged GDP per capita), as they are instrumented by their lagged levels and/or lagged first differences. We employ as before yearly time dummies to control for global business cycle effects; in contrast with other papers, we do not use five year averages to control for national business cycle effects, but stick with Peneder's (2003) method using the employment rate. We do this because we have some indicators with short time spans where taking five year averages is not possible. The system GMM allows for the explicit specification of endogenous variables. With the exception of our yearly time dummies, we set all explanatory variables to be of endogenous nature. To validate our specifications, we need to test for serial autocorrelation in the error and for overidentifying restrictions, i.e. we need to

[10] Estimations are not biased by omission of country-fixed effects constant over time, the most prominent example being initial GDP per capita which has to be included in pure cross-section growth regressions.

pay attention to specify the lag structure of our instruments (too many instruments given the number of observations may lead to statistical artefacts).

As above, we run the regressions for all the variables reported in Table 22 and Table 21. Tables 24a-c report the results of our regressions. The first column shows the results of the regression without any structural indicators for a larger range of countries and years. All the control variables behave as expected in terms of sign and significance; only population at working age is sometimes insignificant. The magnitude of the coefficients is also rather stable, taking into account different number of years and countries per indicator. In the cross-country growth regression context, one coefficient merits particular attention, namely the one on lagged GDP per capita. This coefficient is informative about conditional convergence and is the subject of a large literature (see e.g, Caselli et al., 1996). It explains by what percent per year the initial gap between per capita income relative to its 'steady state' level tends to diminish. Our coefficients on lagged GDP per capita estimated over longer periods range between .81 and .91 which is perfectly in line with studies using similar methodological approaches (see Aiginger – Falk, 2005, Bond et al., 2001). Only in shorter time periods is the coefficient naturally lower, implying faster convergence (columns 6 and 7).[11] Similar to our framework for explaining income levels, we interpret the behaviour of our control variables as lending robustness to our approach. Regarding the structural indicators we start again with our "between"-indicators.

"Between"-indicators: RVA, RCA and share of exports to BRIC countries

We first look at the 3-digit NACE level, meaning that we investigate manufacturing only (table 24a). The RVA in technology-driven industries is again significant, making this indicator closely associated with both income levels and economic growth. In contrast with income levels, the RVA of labour-intensive and low-skilled industries is highly significant, which corroborates our conjectures based on the descriptive statistics in chapter 5. The RVA of labour-intensive industries is again not significant. The RCA of technology-driven industries is associated with economic growth at a confidence level of 10%. It comes as no surprise that the RCA TDI works differently for economic growth than for income levels, as the countries in our sample gaining specialisation in exports by technology-driven industries usually display higher growth rates (e.g., many countries of group 3 and 4). The RCA of labour-intensive industries is again not significant. The share of exports to the BRIC countries in either technology-driven or labour-intensive industries is not significant, as in the income levels, but both BRIC indicators now show the correct sign.

Turning to manufacturing and services combined in the form of our classifications at the NACE 2-digit sectoral level, we see again a similar picture for the RVA and RCA of sectors characterised by their innovative and educational intensity (table 24b). While the RVA's of sectors with either low or high innovation or education intensity show the expected sign, they are not significant. 3 out of 4 RCA's are again significant, the RCA of EDU high and low

[11] To arrive at the measure of convergence λ the logarithm of β_1 is taken. A coefficient value of 0.9 implies that half of the gap between current GDP per capita levels and steady-state levels is closed in about 6.5 years.

sectors as well as the RCA of INNO high sectors (with a coefficient of 0,025 at the 10% level). However, as stated above, we need to be careful given the short time span examined.

"Within"-indicators: export quality and R&D country effect

Looking at table 24c, the set of quality indicators behaves exactly as in the level-framework, with the share of exports in both the high and low price segment of labour-intensive industries significantly associated with economic growth, and the corresponding shares in technology-driven industries not being significant.

Regarding the R&D country effect, none of the variables are significant; some even show estimated coefficients with an unexpected sign. This is most likely the case because in our sample of countries, quickly growing countries often first move into the bottom segment of the value chain of knowledge-intensive sectors, so that the sector effect rises and the country effect decreases. Often it takes time for R&D intensity to catch up with patterns of economic specialisation. Of course, a longer time span would be most welcome to examine the R&D country effect more precisely.

Another interesting result we want to report here is the relationship between education as measured by years of schooling and structural variables such as the RVA of technology-driven industries. Running some robustness and specification tests, RVA of TDI is highly significantly associated with years of schooling. It may be that the RVA of TDI captures the missing quality aspect of our human capital data, indicating how well education is transformed into an effective human capital base, or how well it is transformed into skills determining firm capabilities. Of course, the effectiveness of this transformation is bound to differ by country.

Table 24a: Regression results for GDP per capita growth, "between"-indicators (manufacturing only, 3-digit NACE-level)

System GMM dynamic panel data estimator

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lagged GDP PC	0.8995***	0.9154***	0.9143***	0.9101***	0.8368***	0.8251***	0.8397***	0.8509***
Population	-0.1597*	-0.1558**	-0.1662**	-0.1794**	-0.1837*	-0.2076**	-0.2832**	-0.2449**
Population 15-64	0.1171	0.1238*	0.1305*	0.1410*	0.1115	0.1288	0.2093**	0.1764**
Employment	0.0110***	0.0089***	0.0087***	0.0083***	0.0086***	0.0083***	0.0080***	0.0084***
Lagged Employment	-0.011***	-0.009***	-0.009***	-0.009***	-0.01***	-0.01***	-0.009***	-0.01***
investment	0.0406***	0.0290*	0.0329**	0.0343**	0.0742***	0.0801***	0.0757***	0.0704***
RVA LI&LS		-0.006***						
RVA LI			-0.0072					
RVA TDI				0.0125*				
RCA LI					0.0099*			
RCA TDI						-0.0048		
BRIC LI							-0.0078	
BRIC TDI								0.0013
Constant	1.3391***	1.1520***	1.1193***	1.1634***	2.1529***	2.3430***	2.1842***	2.0541***
Observations	497	327	327	326	300	300	300	300
Number of cou	28	21	21	21	25	25	25	25

LI = Labour Intensive, TDI = Technology Driven Industries, LS = Low Skill, RCA = Revealed Comparative Advantage, RVA = Relative Value Added, BRIC = Brazil, Russia, India, China. All equations contain time dummies, tests for overidentifying restrictions and serial autocorrelation in the error performed.

*** p<0.01, ** p<0.05, * p<0.1

Table 24b: Regression results for GDP per capita growth, "between"-indicators (manufacturing and services combined, 2-digit NACE-level)

System GMM dynamic panel data estimator

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GDP PC	0.6952***	0.6963***	0.7397***	0.7692***	0.8903***	0.8922***	0.8983***	0.9111***
Population	-0.3777**	-0.7069***	-0.5994***	-0.5797***	-0.2935***	-0.2185**	-0.2023*	-0.2329***
Population 15-64	0.2518	0.5715***	0.4699***	0.4677**	0.2295**	0.1516*	0.1356	0.1711**
Employment	0.0046**	0.0061***	0.0066***	0.0076***	0.0064**	0.0061**	0.0055**	0.0058**
Employment	-0.0044**	-0.0054**	-0.0068***	-0.0078***	-0.0081***	-0.0079***	-0.0076***	-0.0078***
investment	0.1422***	0.1437***	0.1332***	0.1184***	0.0565***	0.0609***	0.0618***	0.0555***
RCA Edu High	0.0450***							
RCA Edu Low		-0.0487***						
RCA Inno High			0.0251*					
RCA Inno Low				0.0009				
RVA Edu High					0.0260			
RVA Edu Low						-0.0010		
RVA Inno High							-0.0097*	
RVA Inno Low								0.0130
Constant	3.7728***	4.1183***	3.5469***	3.1478***	1.6281***	1.6164***	1.5602***	1.4106***
Observations	116	116	120	120	189	189	189	189
Number of cou	21	21	23	23	21	21	21	21

RCA = Revealed Comparative Advantage, RVA = Relative Value Added. All equations contain time dummies, tests for overidentifying restrictions and serial autocorrelation in the error performed.

*** p<0.01, ** p<0.05, * p<0.1

Table 24c: Regression results for GDP per capita growth, "within"-indicators

System GMM dynamic panel data estimator

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
GDP PC	0.8204***	0.8326***	0.8107***	0.8432***	0.8919***	0.8831***	0.8853***
Population	-0.3133**	-0.3145**	-0.2608**	-0.2843**	-0.2238**	-0.305***	-0.297***
Population 15-64	0.2347**	0.2345**	0.1847*	0.2039**	0.1760*	0.2512**	0.2451**
Employment	0.0080***	0.0072***	0.0088***	0.0069***	0.0075***	0.0072***	0.0076***
Employment	-0.01***	-0.01**	-0.010***	-0.009***	-0.009***	-0.009***	-0.009***
investment	0.0832***	0.0833***	0.0787***	0.0822***	0.0480**	0.0541***	0.0521**
High Price Segment LI	0.0004*						
High Price Segment TDI		0.0000					
Low Price Segment LI			-0.0006**				
Low Price Segment TDI				0.0003			
RDCE					-0.0022		
RDCE Inno High						-0.0052	
RDCE Inno Low							0.0208
Constant	2.3989***	2.3457***	2.4619***	2.2384***	1.4613***	1.5985***	1.5790***
Observations	275	275	275	275	276	276	276
Number of cou	25	25	25	25	28	28	28

LI = Labour Intensive, TDI = Technology Driven Industries, RDCE = R&D Country Effect. All equations contain time dummies, tests for overidentifying restrictions and serial autocorrelation in the error performed.

*** p<0.01, ** p<0.05, * p<0.1

6.3. Conclusions

In general, the results of our empirical analysis are on the robust side, as we are able to reach similar results as previous papers or strands of literature based on similar methodological approaches and the effects of our indicators are almost always in line with our expectations derived from our descriptive analysis in chapter 5. Differences between the explanation of growth rates and income levels can be reasonably reconciled given our sample of countries spanning countries with higher GDP per capita levels and lower growth rates as well as countries with lower GDP per capita levels and higher growth rates. Of course, we still need to be careful in terms of interpretation, as many indicators are due to problems of data availability calculated over a rather limited time period.

That structural change and economic specialisation proxied by various indicators can be potentially useful in explaining competitiveness proxied by GPD per capita is in itself not new, as several empirical papers have reached the same conclusion. The value of our analysis lies first in our confirmation of the earlier literature using more recent data and a different set of countries; second in our increased understanding of the specific indicators we have selected for our monitoring set, helping us in particular to interpret the effect or the meaning of changes in indicators, one of the explicit goals of this report.

To summarize briefly our "between" indicators, i.e. indicators of economic specialisation, looking at manufacturing indicators only, the value added indicators (RVA TDI, RVA LI&LS) are more closely associated with developments of income levels and growth rates than the trade indicators, in line with our observations from chapter 5. This pattern turns around when we include services, as the test of international markets is here less confused by internationally fragmented value chains.[12] Hence, a combination of RVA indicators based on the WIFO factor-input taxonomy (NACE 3-digit, manufacturing only) together with RCA indicators based on the WIFO innovation and education taxonomies (NACE 2-digit, manufacturing and services) seems to be a meaningful combination to monitor trends in economic specialisation and structural change.

Looking at "within"-indicators, the share of exports in high price or low price segment of labour-intensive industries gives a clear qualification to indicators of trade or value added shares. Sustaining competitiveness in labour-intensive industries is possible by moving up the quality ladder. The indicators calculated for the technology-driven industries were not significant, but this may be due to data problems and before we reach a final verdict we would definitely try to exploit a longer time series of our data. The quality indicators definitely help us to interpret movements of trade indicators of economic specialisation such as RCA.

Movements in the R&D country effect are less directly useful for interpreting trends in competitiveness as it tends to be not favourable to catching-up countries making quick inroads into knowledge-intensive sectors from the less-research intensive segment of the

[12] Of course, internationally fragmented value chains do not completely invalidate manufacturing-only trade indicators. Other factors, such as path dependency of industrial development, also matter.

value chain. For this reason, it is more closely associated with income levels than with growth rates. For advanced countries featuring high GDP per capita levels the R&D country effect has a stronger relationship with competitiveness developments than for catching-up countries. Hence, we should not see decreasing country effects as necessarily bad. It may be related to R&D intensity lagging behind economic specialisation. However, the R&D country effect is still very informative for guiding policies related to increasing competitiveness, such as the overall R&D intensity of a country. And, the R&D country effect fits very well with theories of economic growth which view determinants of economic growth conditional on an economy's level of development (e.g., Acemoglu – Aghion – Zilibotti, 2006).

Of course the fact that we could not test some indicators such as the firm demography indicators due to limited data availability does not preclude their relevance for assessing competitiveness. However, their interpretation must rely more strongly on conceptual models and descriptive statistics.

7. BUSINESS CYCLE VOLATILITY AND KNOWLEDGE INTENSITY OF SECTORS: IS THERE A LINK?

7.1. Summary

The aim of this chapter is to address the following questions.

1. To what extent are knowledge and technology intense sectors exposed to the business cycle, i.e. what is the short-run impact of the business cycle on industry performance?
   Findings:
   - The level of the impact of business cycles on value added and employment growth varies greatly across industries. They have a strong impact on technology intense industries; however, fluctuations in aggregate output have the most pronounced impact on those industries with a low educational intensity.
   - The impact of short run changes in output is asymmetric across industries. Value added and employment growth across industries react more heavily to economic downturns than to economic upswings. This indicates that firms are more conservative in expanding employment in upswings than reducing it during downturns, and that they incur additional costs in boom phases so that value added does not increase as much as it falls during downswings.
2. What role do business cycles play in the long run development of industries as opposed to the factors driving structural change, i.e. what is the long-run impact of the business cycle on industry performance?
   Findings:
   - The overall importance of business cycles for long run growth is somewhat limited: Sector specific changes in productivity and demand that are not related to short run cyclical variations considerably outweigh the impact of business cycles on long-run industry performance. However, the impact of the business cycle is statistically significant, indicating that it does have a persistent effect on performance. This effect is more accentuated in sectors with higher technology intensity than in other sectors. Our findings therefore support the arguments put forward by the OECD in favour of supporting these industries during sharp economic downturns.
3. How does the volatility of technology and skill intensive sectors compare with aggregate volatility? What is their contribution to growth in value added and employment across countries?
   Findings:
   - Technology intense industries fluctuate more strongly relative to aggregate variations in output. Industries with low educational intensity fluctuate much more strongly than the economy as a whole regarding value added and employment growth, in fact more than any other industry group.

- The total contribution of technology intense industries to aggregate value added growth is rather small when compared with the service sector, from where the largest shares of aggregate employment growth also originate. Among the technology intense sectors the science based service industries (business services) make the largest contributions to valued added growth.
- Aggregate employment growth is driven by industries with high to intermediate educational intensity as well as by industries with medium low and low educational intensity. The contribution to aggregate employment growth of industries with very low educational intensity was negative.

7.2. Introduction

In the immediate aftermath of the economic crisis in 2008 the OECD urged policy makers in their member states to invest into research and innovation in order to restore long-term growth (cf. OECD 2009). The main reason for this call to focus public support on research and innovation was that technology intense industries are considered to be very sensitive to economic downturns. The main arguments presented in favour of supporting technology intensive sectors were as follows:

- R&D is typically financed out of the cash flow of firms. A fall in earnings and value added is likely to affect R&D and other innovation investments negatively and cause R&D investments to vary pro-cyclically.[13]
- Economic downturns also have a negative impact on entrepreneurship and business dynamics as venture capital dries up. This may affect the economic performance of entire industries as fewer new and innovative firms are created.
- Technology intensive firms only have intangible capital to offer as collateral and therefore typically experience difficulties in procuring external finance. This problem is exacerbated during economic downswings, as banks become more selective in granting loans. As a consequence firms will not invest or postpone investments, especially investments in the expansion of their own activities, so that employment growth at the industry level is negatively affected.
- The reduction of employment in R&D and other business services causes a depreciation of human capital which is then no longer available in phases of economic upswings, and has to be regained through substantial training.

The economic literature argues that these factors are principal drivers of long term growth. As a consequence, if they are affected during economic downturns they are likely to negatively affect the competitiveness and performance of the economy as a whole and in particular also industries with high technological and skill intensity. The recommendation therefore was to

[13] One strand of the economic literature argues that recessions may stimulate R&D and innovation. The opportunity costs of achieving productivity growth are lower in recessions (Aghion - Saint-Paul, 1998); recessions may provide incentives to undertake research activities (Canton - Uhlig, 1999). The recent empirical literature tends to view R&D as pro-cyclical, even in the absence of credit constraints (Barlevy, 2007). In any case, our empirical framework would pick up a positive impact of recessions on knowledge-intensive sectors.

enhance the resilience of R&D spending and innovative business creation over the cycle instead of supporting ailing industries. The latter would only have the effect of postponing necessary industrial restructuring.

While these arguments and the implied recommendations are plausible, there is little systematic evidence whether technology intense industries as a whole are more heavily affected by economic cycles than others. Given the importance technology intense sectors have for long run growth it is however worth taking a closer look at this issue. This report therefore aims at answering the following questions:

1. Are knowledge and innovation intense sectors more or less exposed to the business cycle and what are their effects on employment and value added growth?
2. To what extent do technology and education intensive sectors contribute to the aggregate volatility as well as to growth in value added and employment across countries?
3. Do sector specific changes in productivity and demand that are more closely related to long-run structural change, outweigh short run output variations due to business cycles?

With respect to the last two questions the general expectation is that the impact of short run fluctuations on economic performance is small as compared to changes in technology and demand driving long run growth. As well as short run effects on growth it is also likely that business cycle fluctuations exert a long run influence through the reductions in innovation investments and R&D that only affect performance with some delay. However, these effects should be limited with regard to secular changes in technology and demand.

The study will follow the methodology proposed by Hölzl and Reinstaller (2007, 2011) for the study of structural change in an economy. The method allows you to decompose changes in productivity and output at the industry level into sector specific changes to productivity and demand that are independent of aggregate output fluctuations, and changes that are related to business cycles. The basic data source would be the EUKLEMS data which are available up to 2007.

7.3. Estimation of the exposure of industries to business cycles and their contribution to the recovery

7.3.1. Overview on the methodology

In order to estimate the exposure of industries to business cycles and their contribution to the recovery, this study tries to establish how employment growth and value added change at the industry level in response to aggregate output variations. The approach pursued in this study is to keep apart the factors that reflect variations in industry specific productivity and demand that are related to business cycles, and changes that are idiosyncratic to industries and do not reflect aggregate cyclical variations. For this reason this study makes use of multivariate time series models that permit to disentangle these factors. The methodology is as follows

1. Identify aggregate output variations over the business cycle;

2. identify idiosyncratic variations in industry specific productivity and demand that are not related to aggregate variations;
3. estimate the impact of aggregate output variations over the business cycle and idiosyncratic variations on employment growth and value added.

In the next sections we give a more detailed overview on these analytical steps.

7.3.2. Identifying output variations over the business cycle

This study uses estimations of the aggregate output gap, i.e. the difference between the potential output an economy can achieve given its resources and the measured output. The principal challenge using changes in the output gap as a measure for cyclical variations is to determine the potential output of an economy which cannot be observed directly. One method to overcome this problem is to use a Hodrick-Prescott (HP) filter on the aggregate output series.[14] The HP filter decomposes time series in their long-run trend and cyclical components.[15] The underlying assumption using this method for the identification of business cycles is that the potential output varies only over very long periods, whereas the output gap fluctuates at shorter frequencies. A more detailed description of the methods is given in Box 1. The output gap identified through the application of an HP filter is therefore a de-trended (stationary) time series. The deviations then reflect economic up and down-swings.

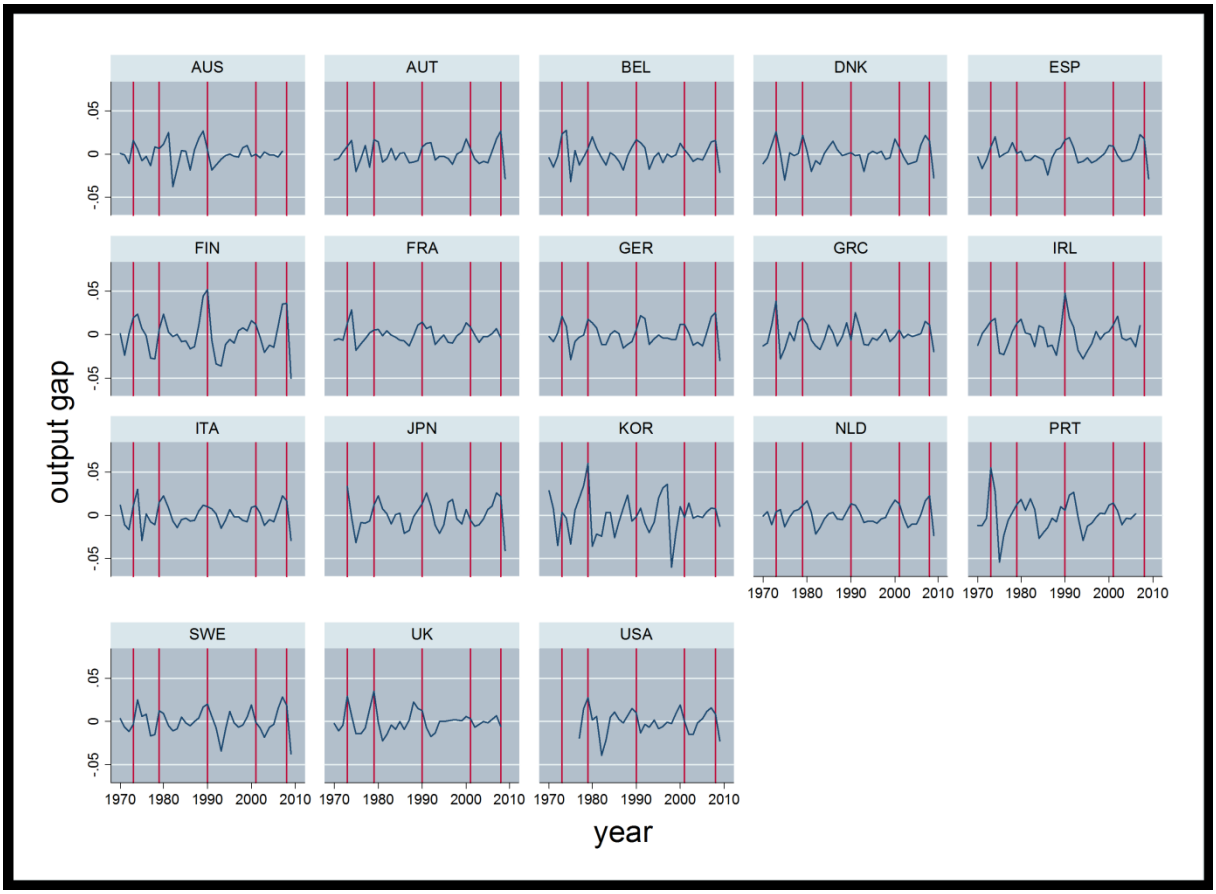
Figure 27 shows the results from the application of the HP filter on the time series of aggregate value added growth for 18 EU and non-EU countries. The vertical lines in the figure indicate the years in which major economic downturns started to propagate through the world economies (1973, 1979, 1990, 2001, 2008). The output gap recovered from the HP filter seems to capture these downturns both in terms of timing and size.[16]

[14] Alternative methods for estimating output gaps are used in the literature. One of the most common methods is the output gap estimation based on a production function approach. In this approach time series for factor inputs as well as total factor productivity are used to estimate the potential output of an aggregate production function for an economy. The correct identification of an aggregate production function represents a problem that has hitherto no been solved satisfactorily.

[15] A potential problem of the HP filter is its instability on the boundaries. The filter weights observations on the boundaries more strongly and this affects the identified trend. This issue is however of limited relevance for this study as the instability on the boundaries is essentially relevant in the context of forecasting and the revision of forecasts. In addition, we use annual data where the instability has a more limited impact.

[16] Alternative methods such as the Christiano-Fitzgerald filter have been used to verify whether the HP-filter used in this study correctly dates the turning points in the data. The results show that the HP filter used here and alternative methods lead to results that are highly correlated ($r>0.9$), indicating that the HP filter leads to an accurate dating of up- and downswings. The literature also shows that the HP filter outperforms the CF filter in turning point signal stability but has a weaker performance in absolute numerical precision (Nilsson – Gymonai 2009).

Figure 27: Identification of business cycles through by applying the HP filter on value added for 18 EU and non-EU countries, 1970-2010.



Note: Vertical reference lines indicate starting year of major economic downturns since 1970 (1973, 1979, 1990, 2001, 2008). Following the frequency power rule the parameter λ in the HP filter was set to 6.25.

Source: EUKLEMS data, WIFO calculations.

Box 1: HP-Filter and frequency power rule

The Hodrick-Prescott filter decomposes into a cyclical and a trend component. The filter finds a good approximation of the trend component y_t^* to the observed time series y_t, $\sum_{t=1}^{T}\left(y_t - y_t^*\right)$ and a smoothed trend $\sum_{t=2}^{T-1}\left[(y_{t+1}^* - y_t^*) - (y_t^* - y_{t-1}^*)\right]$ by solving the following problem:

$$\min \sum_{t=1}^{T}\left(y_t - y_t^*\right)^2 + \lambda \sum_{t=2}^{T-1}\left[(y_{t+1}^* - y_t^*) - (y_t^* - y_{t-1}^*)\right]^2 .$$

The parameter λ is defined as smoothing parameter and it determines the "penalty" imposed on the trend component. If λ tends towards infinity the trend component converges to a linear trend.

To establish the correct value for λ the so-called frequency power rule is used. It determines that λ should equal the frequency of observations for each year in the time series divided by four. This factor should then be taken to the power of four and multiplied with 1600. Applying this rule to the time series used in this study gives a value for λ=6.25.

7.3.3. Identifying idiosyncratic changes in productivity and demand at the industry level across countries

It is well known that both productivity and demand change as a result of business cycles (cf. Basu 1998). However, these changes are not related to technical progress or changes in industry specific demand that are related to long run changes in consumer preferences. In order to assess the impact of business cycles on industry performance it is therefore necessary to disentangle these two aspects. Our next step in the methodology is to identify idiosyncratic variations in productivity and demand growth across industries that are uncorrelated to business cycle fluctuations. These variations will then be used to control for industry specific developments that have an impact on employment and value added growth but that are not related to the short run business cycles. This ensures that the estimates on the direct impact of business cycles on industry performance will be more accurate.

In order to identify idiosyncratic variations in productivity and demand growth, the study uses bi-variate structural vector autoregressive (SVAR) models for each industry in each country in the sample. This method estimates how at some time *t* productivity growth and hours worked (as a proxy for demand) affect each other respectively at some time *t+n*. It is possible to impose some structure on how these variables influence each other using insights from economic theory. This study uses a long run restriction (cf. Blanchard and Quah 1989, Galí 1999) specifying that changes in demand in an industry do have only transitory effects on labour productivity growth, whereas changes in labour productivity growth in an industry have a permanent impact on demand in that industry. This assumption is often encountered in the study of the impact of technical progress on demand (cf. Hölzl and Reinstaller 2007).

Box 2: Structural VAR model with long-run restrictions

The identification of sectoral productivity and demand shocks is based on a SVAR model with a long run restrictions (Blanchard and Quah 1989). We estimate the following empirical model for each sector: if both sectoral productivity and demand series are I(1) the data vector is given by $\hat{y}_{i.t} = [\Delta\hat{l}_{i.t}\ \Delta\hat{h}_{i.t}]$, where $\Delta\hat{l}_{i.t}$ corresponds to the sectoral growth rates of (hourly) productivity and $\Delta\hat{h}_{i.t}$ to the growth rates of worked hours gained by first differencing the logs of these series. Accordingly, for each sector i we estimate a reduced form VAR(p) process

$$\hat{y}_{i,t} = \Psi_0 + \sum_{j=1}^{p} \Psi_j \hat{y}_{i,t-j} + \sum_{l=0}^{s} \Psi_{x,l} x_{t-l} + e_{i,t}$$

where Ψ_0 is a vector of parameters representing the intercept of the VAR, Ψ_i is the parameter matrix of the VAR and $\hat{y}_{i.t-i}$ are the p lags of the vector of endogenous variables, $\Psi_{x.l}$ is the parameter matrix of the influence of the exogenous variables x_{t-l} on the endogenous variables over horizon s. The exogenous variable is the contemporaneous business cycle shock recovered from the output gap estimation described in the previous section. Finally, $e_{i.t}$ is the vector of the reduced form disturbances of the VAR. If the VAR(p) is stable, then a related VMA(∞) representation exists and is given by

$$\hat{y}_{i,t} = \mu_i + \Phi_{i,x}(L)x_t + \Phi_i(L)\sigma_{i,t}$$

where μ_i is a time-invariant mean of $\hat{y}_{i.t}$, L is the lag operator and $\Phi_i(L)$ is the long run multiplier matrix of the structural shocks in vector $\sigma_{i.t}$, where $\sigma^p_{i.t}$ and $\sigma^d_{i.t}$ are the structural shocks defined before. Additional to the assumption that the industry specific productivity shocks $\sigma^p_{i.t}$ and the demand shocks $\sigma^d_{i.t}$ are orthogonal with respect to each other, we also normalize them to have unit variance. The coefficient matrix $\Phi_{i.x}(L)$ contains the effects that changes in the exogenous variable x_t have on the endogenous variables. In order to recover the structural shocks we impose the restriction $\Phi_i^{12}(1) = 0$, i.e. $\Phi_i(1)$ is lower triangular. This restriction captures the idea that demand shocks have no permanent effect on productivity. It is then possible to recover $\sigma_{i,t}$ from the reduced form disturbances $e_{i,t}$ of the VAR

With this restriction it is possible to extract so-called technology shocks and non-technology shocks from the data. Several studies have shown that at the economy wide level technology shocks recovered in this way are closely correlated to other measures of technical change such as modified (cost- rather than revenue-based) Solow residuals. Non-technology shocks on the other hand have been shown to be related to changes in demand (cf. Galí 1999, Alexius and Carlsson 2005). Hölzl and Reinstaller (2007, 2011) provide evidence that these findings hold also at the industry level.[17]

[17] The assumption that business cycle shocks and structural shock are uncorrelated is one possible shortcoming of this method used in this study insofar as it is violated when there are permanent effects of business cycles on long-run growth. If such effects exist, then the chosen method is likely to underestimate their effect. One has to be aware of this issue when interpreting the results of our analysis.

In order to ensure that the industry specific shocks identified through the procedure outlined above reflect idiosyncratic developments in productivity and demand and are not influenced by business cycles, it is necessary to control for business cycle fluctuations in the sectoral SVAR regressions. As a result the recovered industry specific technology and demand shocks are uncorrelated with business cycle fluctuations. This procedure has been proposed by Hölzl and Reinstaller (2007) and is used in this study. Technical details are given in Box 2.

7.3.4. Estimating the exposure of industries to business cycles and their contribution to economic recovery

The magnitude of the impact of business cycles on industry performance is established through a regression analysis. The output gap indicators for each country, industry specific technology and demand shocks and sector and country dummies are regressed upon the rates of change of employment and value added across industries and countries. The estimated baseline model looks as follows:[18]

$$y = \beta_1 z_c + \beta_2 ts_{c,i} + \beta_3 ds_{c,i} + \beta_4 z_c \eta_i + \gamma_1 \eta_c + \gamma_2 \eta_i + e$$

were $y_{\cdot}$ denotes the growth rate of industry employment or value added across countries c and industries i, z_c are the estimated country specific output gaps and $ts_{c,i}$ and $ds_{c,i}$ represents the industry specific productivity and demand shocks. The dummies η_c and η_i control for country and industry effects not accounted for by other indicators in the regression, and e is an idiosyncratic error term.

The interaction term $z_c * \eta_i$ captures variations in the effect of business cycles across specific industries. It implies that the impact of business cycles on industry performance varies as a function of the affected industry. The impact of the business cycle on a particular industry is therefore the linear combination of the main effect and the interaction effect: $\beta_1 z_c + \beta_4 z_c \eta_i$.

The continuous right hand side variables (z_c , $ts_{c,i}$, $ds_{c,i}$) in the regressions are standardised to have zero mean and standard deviation one. In this way it is possible to compare the magnitude of the impact of the business cycles and idiosyncratic industry shocks directly, and to rank industries by the magnitude of the impact of business cycles.

In order to estimate the impact of economic downturns on industries as well as their contribution to economic recovery the model shown above is estimated separately for negative and positive changes in business cycle. This permits accounting for possible asymmetries in the industry specific reaction to downswings an upturns, that are not taken into account by the baseline model.

Finally, in order to assess the relative importance of short run variations in aggregate output and idiosyncratic changes of productivity and demand at the industry level for employment and value added growth we estimate the following pooled regression for each sector *i*

[18] We drop the time dimension.

$$y_i = \alpha_i + \beta_1 z_c + \beta_2 ts_{c,i} + \beta_3 ds_{c,i} + \gamma \eta_c + e_i$$

In this model y_i denotes the growth rate of employment or value added across in industries *i* across countries *c*, z_c are the estimated country specific output gaps and $ts_{c,i}$ and $ds_{c,i}$ represent the industry specific productivity and demand shocks. The dummies η_c controls for country effects not accounted for by other indicators in the regression. The term e_i is again the error term.

7.4. Data

7.4.1. The data

In this study we use the EU KLEMS dataset (release November 2009).[19] The industry data for the most recent release are available either at either at the NACE 2-digit level or at higher levels of aggregation. While the EU KLEMS dataset covers all EU member states our methodological approach requires that time series are sufficiently long (> 25 observations). For this reason data on the New Member States could not be included in the analysis. Table 25 gives an overview on the country, time and industry coverage of this study. A description of the industry classes is presented in Table 27 on page 98.

Table 25: Overview on the data coverage

Countries (abbreviations following ISO 3166 – 3 digit)	AUS, AUT, BEL, DNK, ESP, FIN, FRA, GER, GRC, IRL, ITA, JPN, KOR, NLD, PRT, SWE, UK, USA
Time coverage	1975-2007 (annual frequency); PRT,JPN: 1975-2006; USA: 1979-2007
Industry coverage (following NACE 1.1)	15t16, 17t19, 20, 21t22, 23, 24, 25, 26, 27t28, 29, 30t33, 34t35, 36t37, 50, 51, 52, 60t63, 64, 70, 71t74, AtB, C, E, F, H, J, L, M, N, O

7.4.2. Variables

Box 3 presents the main variables from the EU KLEMS dataset used in this study. The principal variables for the SVAR analysis (see Section 7.3.3) at the sector level are hourly productivity and hours worked. In addition the SVAR analysis makes also use of the output gap variable (HP_gap) as defined in Section 7.3.2. The growth rates of value added and employment at the industry level are used to capture industry performance in the regression analysis sketched in Section 7.3.4 These are the key variables from the EU KLEMS database. The other variables used in the analysis are based on transformations on these data series. The

[19] www.euklems.net

output gap variable is recovered from the application of the HP filter on the aggregate series for real value added. The idiosyncratic industry specific demand and productivity shocks (ps_hp and ds_hp) instead are extracted trough a decomposition procedure from the residuals of the sectoral SVAR regressions (see Box 2 for details).

Table 26: Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
HP_gap	588	-0,0004498	0,0132594	-0,0598915	0,0598416
VA	17636	1261425	5307347	3,106,628	7,17E+07
VA_P	17636	0,9307844	2,252,989	0,020033	1,284,587
H_EMP	17636	1221,07	2,714,813	0,9745235	38533,71
EMP	17636	6,627,746	1,504,345	0,4853204	20950,27
p	17636	109020,4	573029,1	1,756,561	1,27E+07
ts_hp	17636	0,0004651	0,9039632	-6,184,743	5,08E+00
ds_hp	17636	0,0002486	0,9016267	-4,722,026	5,19E+00
grVA	17636	0,0308441	0,1009076	-0,9112158	4,222,222
grEMP	17636	0,005347	0,0545842	-0,6630197	1,431,877

Box 3: Variables derived from the EU KLEMS database:

$VA_{i,j,t}$ gross value added at current basic prices (in millions of local currency)

$VA\_P_{i,j,t}$ gross value added, price indices, 1995=100: Deflator at the industry level

$EMP_{i,j,t}$ number of persons engaged (in thousands)

$H\_EMP_{i,j,t}$ total hours worked by all persons engaged (in millions); domestic concept

Indices *i,j,t* for sector, country and time.

Constructed variables:

$$p_{i,j,t} = \left(\frac{VA_{i,j,t} * 100}{VA\_P_{i,j,t}} \right) \Big/ H\_EMP_{i,j,t}$$

Hourly labour productivity, where $\frac{VA_{i,j,t} * 100}{VA\_P_{i,j,t}}$ equals real value added

$grVA_{i,j,t} = \ln(p_{i,j,t}) - \ln(p_{i,j,t-1})$ growth in real value added in country *j*, sector *i* at time *t*

$grEMP_{i,j,t} = \ln(EMP_{i,j,t}) - \ln(EMP_{i,j,t-1})$ employment growth in country *j*, sector *i* at time *t*

$lnh = \ln(H\_EMP_{i,j,t})$ log hours worked in country *j*, sector *i* at time *t*

$lnp = \ln(p_{i,j,t})$	log productivity in country *j*, sector *i* at time *t*

Table 26 provides some summary statistics on all these variables. The table shows that the idiosyncratic demand and productivity shocks at the industry level are normalised to a mean of zero and standard deviation of one, whereas the output gap variable, HP_gap, has also mean close to zero, but a much smaller standard deviation. In order to be able to compare the magnitude of the impact of aggregate business cycles and idiosyncratic industry shocks on industry performance it will be necessary to standardise all these variables the same way. For this reason we transform the HP_gap variable also to a mean of zero and a standard deviation of one. The table also shows that the data set is quite large. There are 17636 observations across countries and sectors over time.

7.4.3. Industry classifications

In order to assess whether knowledge or innovation intense sectors are more or less exposed to variations in the business cycle and how business cycle shocks affect the performance of these sectors we use four principal taxonomies that classify industries along:

- the innovation characteristics of industries,
- the innovation intensity of industries,
- the educational intensity of industries,
- the main industry groupings (MIGS), and
- the main economic sectors.

An overview on these classifications is given in Table 27 with the exception of the innovation intensity taxonomy as it remains unchanged from above. The classification of industries based on innovation characteristics draws upon an extended and updated version of the well-known Pavitt taxonomy (cf. Pavitt 1984) by Miozzo and Soete (2001) that includes also service sectors. This taxonomy is used in this chapter alongside the innovation intensity and education intensity taxonomies described above (chapters 4.2.4 and 4.2.5) because it provides additional detail regarding supplier relationships and inter-sector interdependencies that might be important in the impact and propagation of business cycles. According to the extended Pavitt taxonomy, manufacturing and service industries are classified as scale intense, supplier dominated, specialised suppliers or science based. This taxonomy is used in this study because it captures the predominant production techniques, supply relationships and the specialisation of industries. These aspects are likely to play a role in the propagation of business cycle shocks and their impact on industry performance. For instance, one may think of reasons why scale intensive industries are likely to adjust more slowly to short run variations in aggregate demand. Given the scale intensity firms in these sectors may have an incentive to reduce production and employment to a limited extent to keep capital utilisation high. This would imply that cyclical downswings affect value added growth more heavily than employment growth. On the other hand, specialised suppliers may be harder hit by business cycles as they tend to deliver specialised inputs to supplier dominated firms. If firms

in these sectors postpone investments business cycles propagate more heavily in specialised supplier industries, such that both value added and employment growth could be heavily affected. These aspects will be explored in the analyses using this taxonomy.

Table 27: List of sectors included in the study and their classification

NACE Code (Rev 1.1)	Description	Extended Pavitt taxonomy	Peneder educational intensity	MIGS	Main sectors
15t16	Manufacture of food products, beverages and tobacco	supplier dominated	low	CONS	IND
17t19	Manufacture of textiles and textile products; manufacture of leather and leather products	supplier dominated	very low	CONS	IND
20	Manufacture of wood and wood products	supplier dominated	very low	INT	IND
21t22	Manufacture of pulp, paper and paper products; publishing and printing	scale intensive	intermediate	CONS	IND
23	Manufacture of coke, refined petroleum products and nuclear fuel	supplier dominated	medium high	ENERG	IND
24	Manufacture of chemicals, chemical products and man-made fibres	science based	medium high	INT	IND
25	Manufacture of rubber and plastic products	scale intensive	medium low	INT	IND
26	Manufacture of other non-metallic mineral products	scale intensive	low	INT	IND
27t28	Manufacture of basic metals and fabricated metal products	scale intensive	low	INT	IND
29	Manufacture of machinery and equipment n.e.c.	specialised suppliers	intermediate	INV	IND
30t33	Manufacture of electrical and optical equipment	specialised suppliers	high	INV	IND
34t35	Manufacture of transport equipment	scale intensive	intermediate	INV	IND
36t37	Manufacturing n.e.c. (furniture, jewellery and related articles, musical instruments, sports goods, games and toys, other)	supplier dominated	medium low	CONS	IND
50	Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel	scale intensive services	low	n.c.	TRADE
51	Wholesale trade and commission trade, except of motor vehicles and motorcycles	scale intensive services	intermediate	n.c.	TRADE
52	Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods	scale intensive services	medium low	n.c.	TRADE
60t63	Transport (land, water, air)	scale intensive services	medium low	n.c.	TRADE
64	Post and telecommunications	scale intensive services	intermediate	n.c.	TRADE
70	Real estate activities	scale intensive services	intermediate	n.c.	BUSERV
71t74	Business services	science based services	high	n.c.	BUSERV
AtB	Agriculture, forestry and fishing;	primary	very low	n.c.	AGRI
C	Mining and quarrying	primary	very low	ENERG	IND
E	Electricity, gas and water supply	scale intensive services	intermediate	ENERG	IND
F	Construction	supplier dominated	low	n.c.	CON
H	Hotels and restaurants	supplier dominated services	very low	n.c.	TRADE
J	Financial intermediation	scale intensive services	high	n.c.	FIN
L	Public administration and defence; compulsory social security	supplier dominated services	medium high	n.c.	PUPSERV
M	Education	supplier dominated services	high	n.c.	PUPSERV
N	Health and social work	supplier dominated services	medium high	n.c.	PUPSERV
O	Other community, social and personal service activities	supplier dominated services	intermediate	n.c.	PUPSERV

Note: n.c are non-classified sectors in the MIGS (Main Industry Groupings) classification.

The classification of industries by educational and innovation intensity has already been described above. In contrast with the main part of the report, when using the education taxonomy we include also public services as these are typically very educationally intense sectors, and as they are part of the public sector, they might also show specific reaction patterns to business cycles that reflect fiscal policies, that in the aggregate attenuate the effects

of changes in employment and output. As we obtain a larger sector of sectors for education, we only group the very high and high intensity class of sectors together but differentiate between low and very low intensity, so that we report our results for six rather than five sector groups.

The last two classifications are presented for ease of reference and comparison. They do not shed light on how sectors produce, only on what they produce just as the standard NACE classification. One corresponds to the definition of the Main Industrial Groupings (MIGS) based on the statistical classification of economic activities in the European Community. This classification is included to ensure comparability of the results presented in this study with related work by DG ECFIN. This classification discriminates between industries in function of their position in the overall value chain. Hence, it distinguishes between the energy sector, investment and intermediate goods sector, as well as the consumer goods sector. This classification does not comprise most of the service sectors. Overall one would expect for this classification that especially the intermediate and investment goods sectors that provide the principal inputs for production should be more heavily affected as variations in aggregate output and changes in expectations on the economic development have an immediate impact on the investment and production plans of firms that revise accordingly.

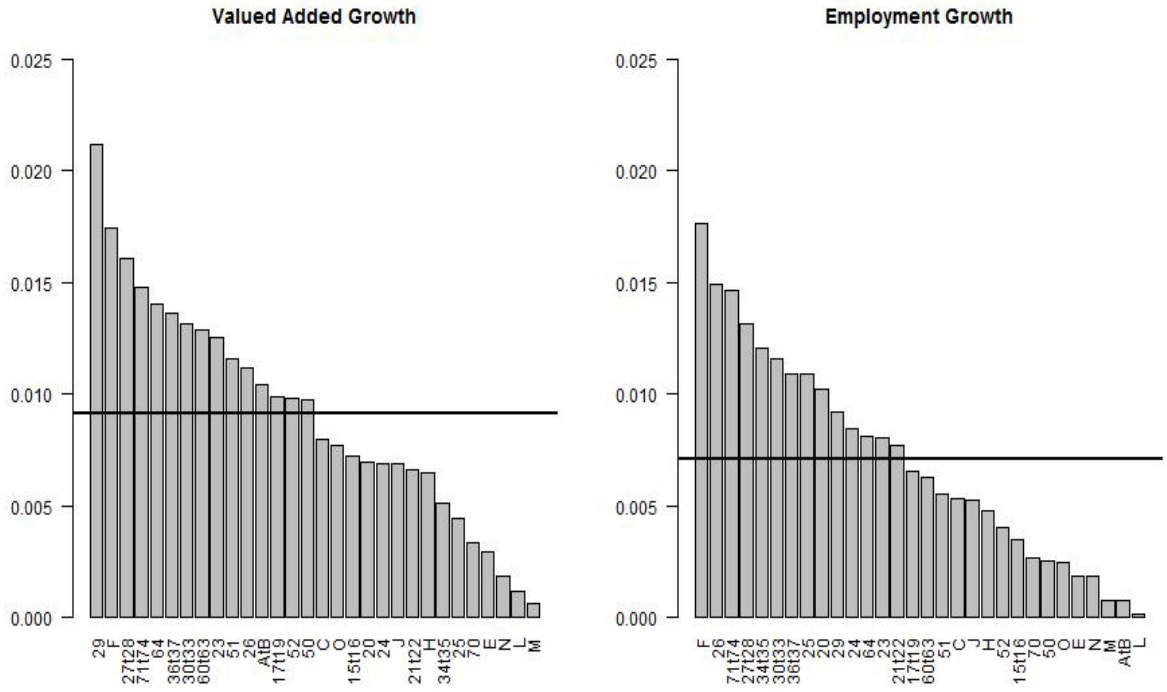
The final classification groups the NACE sector definitions into a few principal groups according to their main economic activity: agriculture, industry, commerce and trade, construction, public services and business services. This group is introduced to verify the validity of this very generic and frequently used classification for the assessment of the impact of cyclical variations in output. Apart from specific patterns for the construction industry and public services it is unlikely that these broad sector aggregates will show distinctive patterns in reactions to output variations as they group very heterogeneous industries such that distinctive developments are likely to average out.

7.5. The impact of business cycles on industry performance and the effect of sector specific developments

7.5.1. The impact of business cycles on industry performance

In order to assess the impact of business cycles on industry performance we first rank industries in terms of the magnitude of the effect short run changes in aggregate output have on the growth of value added and employment at the industry level across countries. In a second step we establish then an identical ranking based on economic downturns and upswings. Finally, we present then these effects for the different industry classes presented in the previous section.

Figure 28: Impact of business cycles on value added and employment growth by sector



Source: EU KLEMS data; WIFO calculations.

Figure 28 presents the ranking of industries in terms of the magnitude of the effect a change in the aggregate business cycle has on industry specific value added and employment growth. When interpreting the values shown in Figure 28 one has to keep in mind, that the output gap variable is standardised to have unit variance. The interpretation therefore is that a change in output gap in the order of one standard deviation causes the growth rate of the performance indicator to change by the value shown in the plot (or the percentage point change if this value is multiplied by 100).

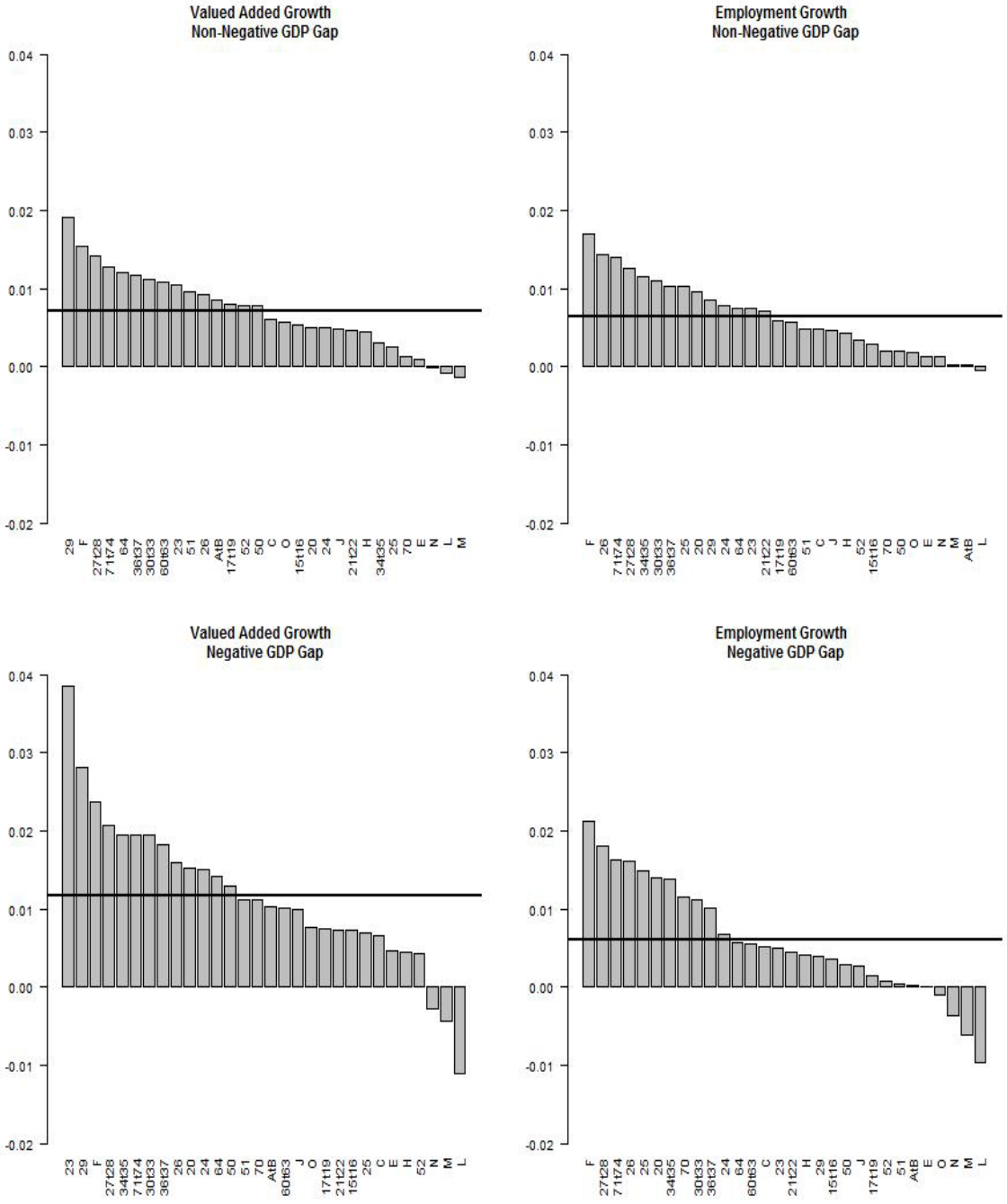
Looking now at Figure 28 the horizontal line in each quadrant represents the average effect of a change in the business cycle on the related performance indicator across industries and countries. A one standard deviation change in the output gap changes value added growth by about 0.9 percentage points on average. The figure is lower for employment growth (about 0.7%). This reflects the fact that value added growth is more sensitive to changes in the business cycle than employment growth. This may reflect labour hoarding effects that are either due to the expectations of employers that cyclical variations have only a temporary effect such that they refrain from laying off or hiring people, or due to legal restrictions limiting the possibility of firms to hire or fire employees .

The magnitude of the impact varies greatly across industries. Looking, for instance, at value added growth one can see that the impact of a change in the business cycle in industry "29" (manufacture of machinery and equipment) is about four times stronger than for industry

"34t35" (manufacture of transport equipment). Looking at the impact of a business cycle shock on employment growth for the same industries one sees that the effects are rather similar and their relative position is inverted. The industry most heavily affected by changes in the business cycle in terms of employment growth is the construction industry ("F") followed by the related industry "26", "manufacture of non-metallic mineral products" that comprises industries producing construction materials. Strongly affected in both performance dimensions are business service ("71t74") and the manufacture of basic metal products and fabricated metal products ("26"). The business services sector comprises also R&D services. The sectors least affected by business cycles both in terms of value added and employment growth are the industries related to the public sector (education, health, public administration). This in line with other accounts of sectoral volatility, such as in Afonso - Furceri (2007).

Looking separately at negative and positive deviations in the cycle on industry performance, Figure 29 shows that the ranking of the industries changes. However the picture does change little with regard to the industries that are most heavily affected by cyclical variations in aggregate output. Figure 29 also shows that the reaction to upswings and downturns is not symmetric in terms of the magnitude of the industry specific responses. In general industries tend to react more heavily and with a larger variation across industries to downturns both in terms of value added and employment growth, than during upswing periods. The industries that react most to changes in the business cycle in terms of changes in employment are construction ("F"), the metalworking industry ("27t28"), the transport equipment industry ("30t33"), industries producing largely consumer goods ("36t37") and the business services sector ("71t74"). Next to these industries also the oil industry ("23") and the mechanical engineering industry ("29") are heavily affected in terms of value added growth. The industries related to the public sector fluctuate anti-cyclically both in terms of value added and employment growth. In these industries employment is created during downturns and is reduced (even though to a much lesser extent) during upswings. This hints at anti-cyclical employment creation in the public sector in the countries studied here.

Figure 29: Impact of business cycles on value added and employment growth: differences in economic downturns (negative GDP gap) and upswings (non-negative GDP gap)



Source: EU KLEMS data; WIFO calculations.

The likely reason for the observed asymmetries lies in the different impact of cyclical changes on structural adjustments. In economic downturns firms will experience a fall in demand and turnover. This affects negatively value added if costs cannot be adjusted immediately due to contractual agreements with supplier or other rigidities on the factor markets. However, firms will try to adjust employment in order to cut cost and restore profitability. In upswing phases, instead, firm are likely to be more conservative with regard to the expansion of the labour force (especially if labour laws make subsequent firing difficult). In place of hiring new employees, they scale up overtime work and increase pay, on the other hand the pressure to cut costs diminishes and hence value added and employment growth do not react as strongly to upswings than to downswings.

Finally, Figure 30 and Figure 31 show the average responses of industries grouped by the taxonomies described in the previous section. The different results by industry classifications should not be compared directly with one another as the different groups have different levels of aggregation and hence different variation. Higher levels of aggregation typically imply lower levels of volatility.

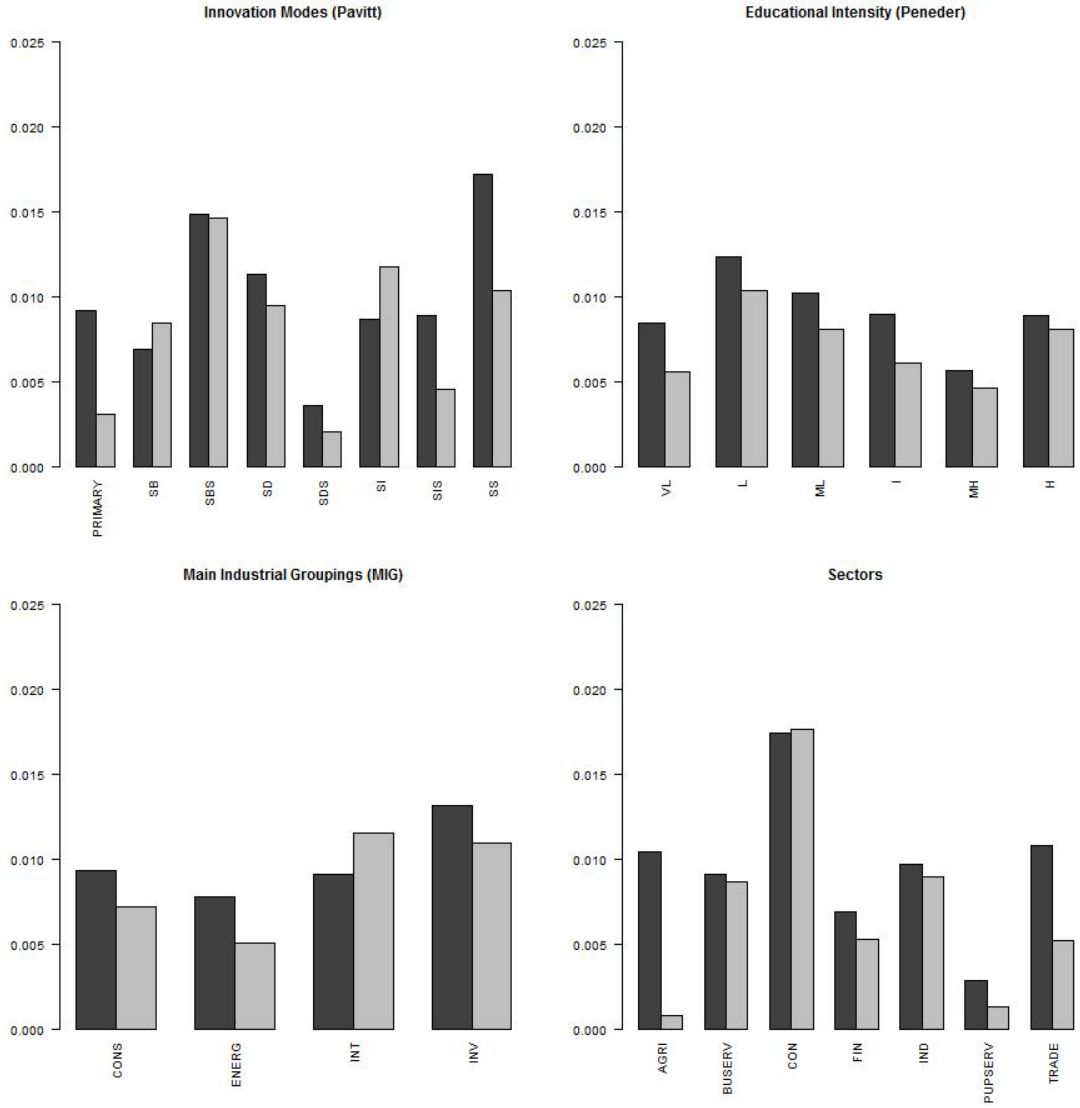
Looking at the figure grouping industries based on the extended Pavitt taxonomy, we see that in terms of value added growth the industries characterised as specialised suppliers (SS) is most heavily affected. This is due to the inclusion of the mechanical engineering industry in this group. It is followed by the science based businesss (SBS) services sector, which comprises the business services ("71t74"). In terms of employment growth the science based service (SBS) industry is most heavily affected by changes in aggregate output. It is followed by the scale intensive industries (SI) and the specialised supplier industries (SS). Overall it is the specialised supplier and the science based service industries that are most heavily exposed to the business cycle. These are also the most technology intense industries in terms of their average R&D shares. This is confirmed by Figure 31 which reports the impact of business cycles according to the industry taxonomy by Peneder (2009) that classifies industries by innovation intensity. As one can see the industries with high innovation intensity are most reactive to business cycles in terms of value added growth, whereas sectors with medium, medium high, and high innovation intensity are also the most reactive sectors to cyclical variations in terms of employment growth.

Looking at the industries classified by educational intensity, we see that the sectors most heavily exposed to the business cycle are the sectors with medium-low to low educational intensity and the sectors with high and very high educational intensity. For the industries with high educational intensity the result is largely driven by the business services industry and by industries related to the public sector. Hence, this finding has to be interpreted with care. The figures for the main industry groupings and the classification according to the main economic activities in the business sector round up the picture: Investment good and intermediate goods industries are most heavily exposed to the business cycle, as is the construction industry.

Figure 30 shows that specialised supplier and the science based service industries are most heavily exposed to the business cycle. These industries have also a high share of highly

educated people in the workforce. On the other hand, the results also clearly show that fluctuations in aggregate output have a marked impact on the industries with low educational intensity. Given that the Main Industrial Groupings classification as well as the Main sectors classification shows little variation across groups, we will continue to use only the classification of sectors based on innovation modes as well as innovation and educational intensity.

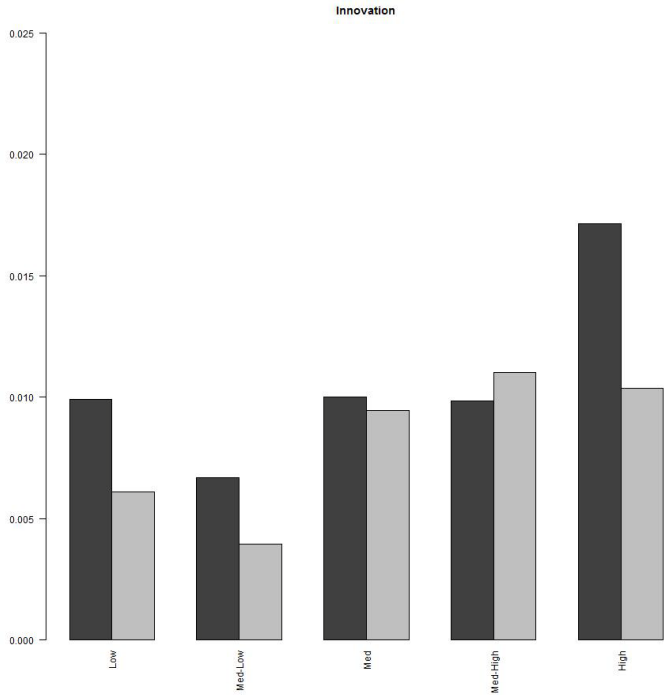
Figure 30: Impact of business cycles on value added and employment growth by industrial classification



Note: Dark bars: impact on value added growth; light bars: impact on employment growth.

Source: EU KLEMS data; WIFO calculations.

Figure 31: Impact of business cycles on value added and employment growth by industrial classification (innovation intensity)



Note: Dark bars: impact on value added growth; light bars: impact on employment growth.

Source: EU KLEMS data; WIFO calculations.

To summarise, the results presented in this section show that the magnitude of the impact of cyclical variations on sectoral employment and value added growth vary considerably across industries. Specialised supplier and the science based service industries are most heavily exposed to the business cycle. The same holds true for industries with low educational intensity of their workforce. However, the reactions to cyclical variations are not symmetric. The results show that sectors with high educational intensity related to public services even fluctuate anti-cyclically.

7.5.2. The relative importance of business cycle shocks and industry specific changes in demand and productivity

The analysis presented in this section assesses the impact of business cycles relative to industry specific changes in productivity and demand on the long run growth of industries. The results are presented in Table 29 and Table 28. These tables show the outcome of a regression analysis used to explore the relationship between cyclical output changes and non-cyclical industry specific changes on the one hand and value added growth and employment growth on the other hand.

The tables present the regression coefficients for the standardised changes in output gap, the standardised changes in industry specific productivity and demand (non-technology shocks). The constant can be interpreted directly as the long run growth trend over the 35 year period of the analysis. Looking for instance at Table 29 the coefficient of the constant for industry "17t19" (textile industry) equals -0.0296. This means that over the past 35 years employment in this industry has shrunk by -2.96 percentage points on average each year. The other coefficients have again the interpretation of the effect of a one standard deviation change of the variable on the growth rate of employment or value added. While without knowing the standard deviation of these variables it is not possible to interpret the coefficients directly as a elasticity, the relative magnitude of the different coefficients can be inferred directly from the coefficients. Looking again at industry "17to19" one can see that the impact of non-technology or demand shocks on long run output growth is about four times bigger than that of changes in the output gap.

Table 28 presents the results for value growth at the level of industries. It largely confirms the evidence for the employment growth rate. The principal difference is that here the industry specific changes in productivity that are unrelated to the business cycle have a positive impact on value added growth. Another important difference is that except for the textile industries all industries have experienced a positive long run trend in value added growth on average across all countries. This implies that while some industries do not contribute to employment growth they contribute to aggregate welfare through value added growth. The contribution to aggregate value added growth has been highest for a number of service industries (post and telecommunications "64", real estate and business services "70" and "71t74"), financial intermediation "J", health "N", sales, maintenance and repair of motor vehicles "50") and for the oil industry ("23"). With respect to the relative importance of industry specific changes in productivity and demand as opposed the changes induced by business cycles on value added growth the results are similar to the previous ones. Across all countries and industries idiosyncratic productivity changes outweigh the effect of the business cycle on long run growth in value added by a factor close to 7. The relative impact of idiosyncratic changes in demand is somewhat lower than for employment growth. However, the impact of industry specific changes in demand is still on average about 4.6 times larger than that of business cycles.

Table 28: Value added growth at the sectoral level: pooled regressions

Sector	agg. output gap		sect. technology shock		sect. non-tech shock		Constant		R^2
	coeff.	t value	coeff.	t value	coeff.	t value	coeff.	t value	
15t16	**0.0073****	**(7.30)**	**0.0261****	**(25.74)**	**0.0217****	**(21.40)**	**0.0149****	**(3.59)**	0.74
17t19	**0.0099****	**(5.82)**	**0.0276****	**(16.02)**	**0.0280****	**(16.24)**	-0.0168*	(-2.37)	0.56
20	**0.0069****	**(4.10)**	**0.0537****	**(31.73)**	**0.0405****	**(23.92)**	0.0086	(1.22)	0.75
21t22	**0.0066****	**(3.47)**	**0.0439****	**(23.12)**	**0.0289****	**(15.22)**	**0.0236****	**(3.00)**	0.63
23	0.0129	(1.10)	**0.2363****	**(20.11)**	**0.0561****	**(4.77)**	0.0467	(0.97)	0.50
24	**0.0069****	**(3.03)**	**0.0510****	**(22.03)**	**0.0250****	**(10.79)**	**0.0212***	**(2.24)**	0.60
25	**0.0044***	**(2.45)**	**0.0514****	**(28.40)**	**0.0329****	**(18.15)**	**0.0229****	**(3.05)**	0.70
26	**0.0111****	**(7.58)**	**0.0395****	**(26.85)**	**0.0328****	**(22.27)**	**0.0235****	**(3.84)**	0.73
27t28	**0.0162****	**(12.19)**	**0.0318****	**(23.05)**	**0.0305****	**(22.13)**	**0.0196****	**(3.55)**	0.78
29	**0.0211****	**(9.38)**	**0.0444****	**(19.25)**	**0.0322****	**(13.95)**	0.0085	(0.91)	0.66
30t33	**0.0131****	**(5.09)**	**0.0680****	**(26.36)**	**0.0385****	**(14.90)**	**0.0257***	**(2.40)**	0.71
34t35	0.0051	(1.45)	**0.0822****	**(23.25)**	**0.0380****	**(10.75)**	0.0221	(1.50)	0.58
36t37	**0.0136****	**(6.52)**	**0.0582****	**(27.96)**	**0.0352****	**(16.91)**	0.0161	(1.86)	0.68
50	**0.0097****	**(5.51)**	**0.0463****	**(26.01)**	**0.0242****	**(13.62)**	**0.0402****	**(5.49)**	0.63
51	**0.0116****	**(9.35)**	**0.0356****	**(28.69)**	**0.0213****	**(17.20)**	**0.0243****	**(4.71)**	0.70
52	**0.0098****	**(9.11)**	**0.0287****	**(26.48)**	**0.0181****	**(16.71)**	**0.0297****	**(6.62)**	0.66
60t63	**0.0129****	**(12.06)**	**0.0267****	**(24.87)**	**0.0191****	**(17.79)**	**0.0333****	**(7.52)**	0.71
64	**0.0140****	**(7.94)**	**0.0429****	**(24.20)**	**0.0256****	**(14.43)**	**0.0711****	**(9.69)**	0.66
70	**0.0036****	**(2.75)**	**0.0093****	**(6.98)**	**0.0174****	**(13.02)**	**0.0403****	**(7.41)**	0.38
71t74	**0.0148****	**(10.56)**	**0.0181****	**(12.77)**	**0.0236****	**(16.69)**	**0.0442****	**(7.60)**	0.59
AtB	**0.0104****	**(5.96)**	**0.0482****	**(26.35)**	**0.0276****	**(15.05)**	**0.0306****	**(4.21)**	0.70
C	**0.0074***	**(2.06)**	**0.0813****	**(22.36)**	**0.0500****	**(13.75)**	**0.0394****	**(2.64)**	0.61
E	0.0029	(1.50)	**0.0481****	**(24.93)**	**0.0278****	**(14.41)**	**0.0318****	**(3.99)**	0.65
F	**0.0174****	**(11.19)**	**0.0200****	**(12.48)**	**0.0308****	**(19.20)**	**0.0371****	**(5.73)**	0.62
H	**0.0065****	**(7.09)**	**0.0263****	**(28.65)**	**0.0231****	**(25.17)**	**0.0295****	**(7.74)**	0.75
J	**0.0068****	**(3.72)**	**0.0456****	**(24.78)**	**0.0244****	**(13.27)**	**0.0450****	**(5.89)**	0.65
L	0.0012	(1.47)	**0.0107****	**(12.98)**	**0.0137****	**(16.67)**	**0.0250****	**(7.46)**	0.48
M	0.0006	(0.76)	**0.0146****	**(17.72)**	**0.0135****	**(16.41)**	**0.0309****	**(9.31)**	0.52
N	0.0019	(1.76)	**0.0184****	**(17.19)**	**0.0132****	**(12.28)**	**0.0417****	**(9.49)**	0.53
O	**0.0077****	**(8.56)**	**0.0232****	**(25.55)**	**0.0181****	**(19.95)**	**0.0322****	**(8.64)**	0.69

Note: t-Statistics in parentheses, ** p<0.01, * p<0.05.

Source: EU KLEMS data; WIFO calculations.

Table 29: Employment growth at the industry level: pooled regressions

Sector	agg. output gap		sect. technology shock		sect. non-tech shock		Constant		R^2
	coeff.	t value	coeff.	t value	coeff.	t value	coeff.	t value	
15t16	**0.0035***	**(2.21)**	**-0.0178****	**(-11.02)**	**0.0141****	**(8.73)**	-0.0012	(-0.18)	0.29
17t19	**0.0065****	**(4.07)**	**-0.0121****	**(-7.48)**	**0.0255****	**(15.72)**	**-0.0296****	**(-4.46)**	0.40
20	**0.0102****	**(5.82)**	**-0.0127****	**(-7.26)**	**0.0308****	**(17.62)**	-0.0003	(-0.04)	0.44
21t22	**0.0077****	**(7.06)**	**-0.0102****	**(-9.32)**	**0.0243****	**(22.27)**	0.0013	(0.29)	0.57
23	**0.0080***	**(2.52)**	**-0.0357****	**(-11.15)**	**0.0513****	**(16.04)**	0.0102	(0.78)	0.42
24	**0.0085****	**(5.82)**	**-0.0185****	**(-12.50)**	**0.0208****	**(14.05)**	-0.0045	(-0.75)	0.43
25	**0.0109****	**(7.53)**	**-0.0130****	**(-8.99)**	**0.0321****	**(22.12)**	-0.0040	(-0.67)	0.56
26	**0.0149****	**(8.59)**	**-0.0132****	**(-7.63)**	**0.0242****	**(13.93)**	**-0.0253****	**(-3.52)**	0.42
27t28	**0.0132****	**(7.33)**	**-0.0167****	**(-8.91)**	**0.0211****	**(11.28)**	-0.0098	(-1.31)	0.38
29	**0.0092****	**(3.06)**	**-0.0189****	**(-6.15)**	**0.0250****	**(8.13)**	-0.0183	(-1.46)	0.25
30t33	**0.0115****	**(7.58)**	**-0.0114****	**(-7.48)**	**0.0339****	**(22.30)**	-0.0104	(-1.65)	0.55
34t35	**0.0121****	**(6.88)**	**-0.0057****	**(-3.28)**	**0.0322****	**(18.36)**	-0.0083	(-1.14)	0.49
36t37	**0.0109****	**(6.50)**	**-0.0126****	**(-7.50)**	**0.0318****	**(18.93)**	**0.0197****	**(2.82)**	0.48
50	0.0025	(1.71)	**-0.0125****	**(-8.46)**	**0.0220****	**(14.93)**	0.0099	(1.63)	0.44
51	**0.0055****	**(4.60)**	**-0.0123****	**(-10.32)**	**0.0167****	**(14.00)**	0.0076	(1.54)	0.42
52	**0.0040****	**(3.66)**	**-0.0094****	**(-8.55)**	**0.0130****	**(11.79)**	**0.0216****	**(4.73)**	0.38
60t63	**0.0063****	**(7.25)**	**-0.0119****	**(-13.67)**	**0.0142****	**(16.31)**	**0.0147****	**(4.08)**	0.49
64	**0.0081****	**(7.03)**	**-0.0110****	**(-9.43)**	**0.0224****	**(19.29)**	**0.0099***	**(2.06)**	0.56
70	0.0029	(1.19)	**-0.0489****	**(-19.87)**	**0.0196****	**(7.95)**	**0.0438****	**(4.37)**	0.48
71t74	**0.0146****	**(9.05)**	**-0.0270****	**(-16.53)**	**0.0249****	**(15.21)**	**0.0534****	**(7.95)**	0.53
AtB	0.0007	(0.78)	**-0.0116****	**(-12.34)**	**0.0171****	**(18.22)**	-0.0037	(-1.00)	0.47
C	**0.0055***	**(2.07)**	**-0.0329****	**(-12.24)**	**0.0351****	**(13.06)**	**0.0236***	**(2.13)**	0.39
E	0.0019	(1.25)	**-0.0227****	**(-14.80)**	**0.0248****	**(16.20)**	0.0003	(0.05)	0.48
F	**0.0176****	**(11.27)**	**-0.0140****	**(-8.70)**	**0.0248****	**(15.41)**	**0.0185****	**(2.84)**	0.46
H	**0.0048****	**(3.16)**	**-0.0170****	**(-11.17)**	**0.0183****	**(12.05)**	**0.0319****	**(5.05)**	0.36
J	**0.0053****	**(4.90)**	**-0.0103****	**(-9.60)**	**0.0190****	**(17.67)**	**0.0267****	**(5.98)**	0.54
L	0.0001	(0.14)	**-0.0098****	**(-9.47)**	**0.0085****	**(8.22)**	**0.0207****	**(4.91)**	0.39
M	0.0008	(0.86)	**-0.0075****	**(-8.19)**	**0.0081****	**(8.76)**	**0.0307****	**(8.28)**	0.39
N	**0.0018***	**(2.17)**	**-0.0076****	**(-8.96)**	**0.0138****	**(16.29)**	**0.0362****	**(10.39)**	0.53
O	**0.0025***	**(2.58)**	**-0.0100****	**(-10.28)**	**0.0167****	**(17.11)**	**0.0294****	**(7.34)**	0.51

Note: t-Statistics in parentheses ** p<0.01, * p<0.05.

Source: EU KLEMS data; WIFO calculations.

Table 29 presents the results for employment growth at the level of industries. The coefficient of the constant capturing the long term growth trend shows that employment in a number of industries has contracted steadily. The trend was most accentuated for the textile industry ("17t19") and the non-metallic mineral products industry ("26") that includes amongst others the glass and the brick industries. On the other hand the industries in which employment was highest in the 35 year period analysed here were the business services and the real estate service industries ("71t73" and "70" respectively). This evidence captures long run structural change away from some manufacturing industries towards services.

Looking at the idiosyncratic productivity and demand shocks it is interesting to note that across all industries productivity changes affect employment growth negatively whereas sector specific changes in demand affect it positively. This is in line with results by Hölzl and Reinstaller (2007, 2011). For almost all sectors with the exception of the public

administration, business services and real estate as well as the production of beverages and tobacco the coefficients for the industry specific demand shocks are larger than the coefficients for the demand shocks. Looking at the relative importance of the industry specific changes in productivity and demand as opposed the changes induced by business cycles the results clearly show that industry specific changes outweigh the impact of business cycles on long run employment growth. The effect of technology shocks across industries and countries is about seven times larger and that of demand shocks is close to eight times larger.

To sum up, the results presented in this section indicate that sector specific changes in productivity and demand that are not related to short run cyclical variations outweigh considerably the impact induced by business cycles on long-run industry performance. They are, on average across industries and countries between five to eight times larger. This lends support to theoretical considerations (see appendix for a discussion) that the factors driving structural change such as technological progress or varying income elasticities of demand are considerably more important for long run industry performance than short run variations in aggregate output growth. It is however important to note that the impact of the business cycle is in all cases small, but in almost all cases statistically significant and in the order of about 1% across sectors and countries for both value added and employment growth when the business cycle indicator changes by one standard deviation. This hints at persistent effects of business cycles on sectoral performance indicators. Mechanisms which link the business cycle to longer-term economic development have been suggested inter alia by Aghion et al. (2010) in the form of credit constraints.

If we look at the sectors that in the Pavitt taxonomy either classify as science based (NACE 24, 71t74) or specialised suppliers (NACE 29, 30t33) then we see that apart from the chemical industry (including pharmaceuticals and biotech; NACE 24) they are among the industries reacting most pronouncedly to cyclical variations in value added and to a lesser extent in employment growth. As these industries are also industries with high R&D intensity, our findings support the arguments put forward by the OECD (see introduction) in favour of supporting these industries during sharp economic downturns. However, the effects of cyclical variations on performance remain rather limited.

7.5.3. Industry composition: Its effect on the aggregate business cycle and growth in employment and value added

The final step of the analysis presented in this report is now to assess how an industry's volatility compares with the economy wide volatility in employment and value added growth, and how an industry contributes to economy wide growth patterns. Aggregate volatility has been shown to be negatively associated with GDP growth, however the relationship between sectoral volatility and growth is still a matter of ongoing research (see Imbs, 2007, for a recent contribution). At the firm level, competitiveness in volatile technology-intensive industries has been argued to benefit from institutional frameworks which facilitate factor market flexibility and high R&D spending (Hall - Soskice, 2001).

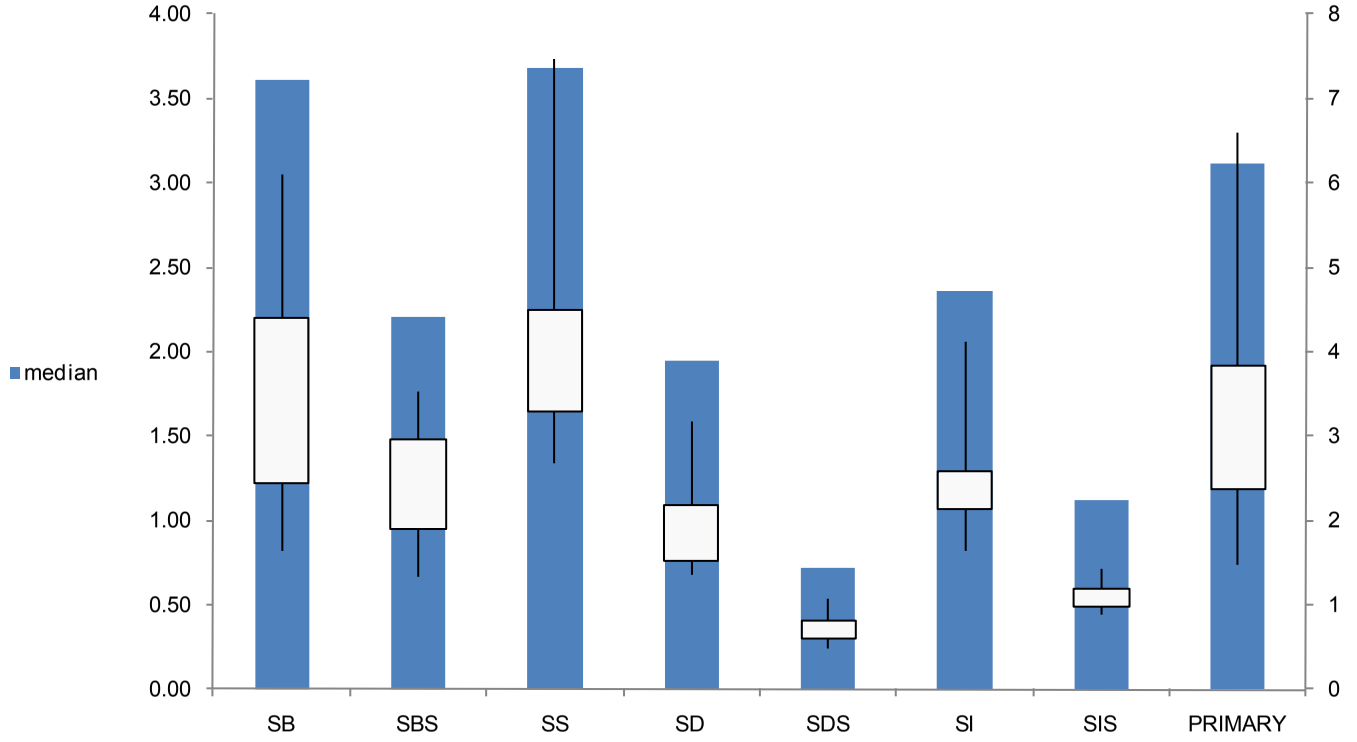
Figure 32 provides evidence on cyclical volatility of specific industry groups relative to the aggregate volatility in their respective country for value added and employment growth. We characterise the sector structure of the eighteen economies included in this study by means of the taxonomies on industry specific innovation modes (Pavitt) and on the innovation and educational intensity of industries. Figure 32 (a-c) show the results for value added growth, and Figure 32 (c-f) the ones for employment growth. The graphs show the volatility of each sector group relative to the volatility of the respective country by means of a box and bar plot. The bars show the median values for the relative volatility of each sector group, and the boxes show the minima and maxima across countries, and the boxes the range between the 25% and the 75% quantile, i.e. where the majority of observations across countries lies. For the bars the relevant scale is on the left side and for the boxes the scale on the right side. A value larger than one indicates relatively higher volatility of a sector by the factor indicated in the figure.

Figure 33a-f instead present the weighted contribution of each of the industry groups to the economy wide growth rate of employment or value added over the entire period of observation. All single contributions sum up to the aggregate growth rate.

Figure 32 (a) and (d) present the volatility of sector groups for value added and employment growth relative to the aggregate volatility in the respective countries. We see that science based manufacturing (SB) and specialised suppliers (SS) are the most volatile sector groups for both valued added and employment growth across countries. Science based services are highly volatile in employment growth and less so in value added growth. The least volatile sectors both in value added and employment growth are the group supplier dominated services sectors (SDS) that capture large parts of the public sector, followed by scale intensive services (SIS) of which the transport, post and telecom and real estate activities are the constituent parts. This would indicate that technology intensive sectors are rather volatile. This is confirmed if one classifies industries according to innovation intensity (Peneder 2009) (Figure 32c and f).

If we analyse the sector contribution to aggregate volatility of value added and employment in terms of the educational intensity of industries presented in Figure 32 (b) and (e), then we see that industries with low educational intensity (VL,L,ML) are showing the strongest cyclical variations both in terms of value added and employment growth. The very low contribution of education intense industries to the aggregate variation is due to the fact that these groups are dominated by supplier dominated (SDS) or scale intense service industries (SIS) such as education, health or the public administration have a high share. The overall picture emerging from this analysis is that technology intensive industries display strong volatility. However, industries with high shares of employees with low levels of educational attainment display the highest volatility.

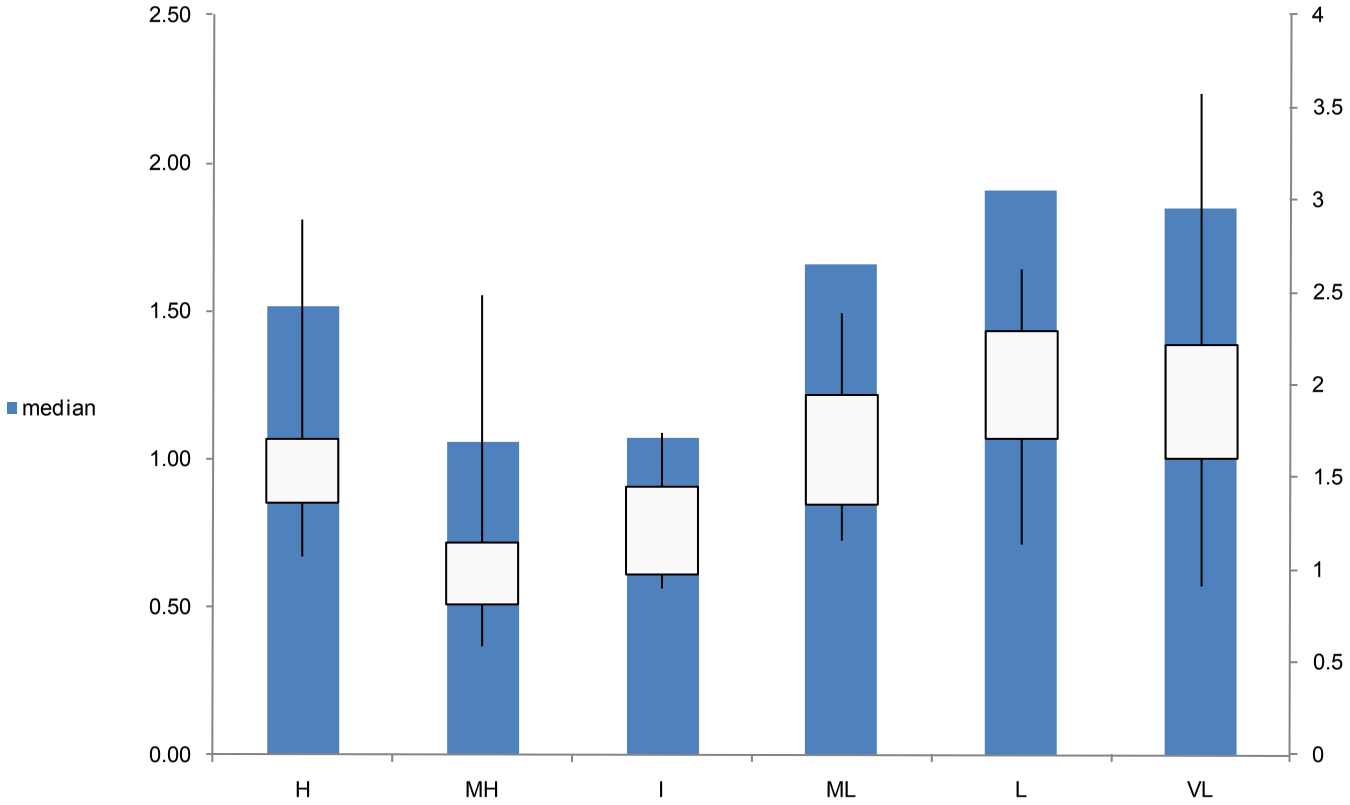
Figure 32 (a): Volatility of VA growth of sector groups relative to aggregate volatility across countries: sectors by innovation mode (Pavitt)



Note: Legend innovation mode taxonomy: SB: science based; SBS: science based services; SS: specialised suppliers; SD: supplier dominated; SDS: supplier dominated services; SI: scale intense industries. Boxplots show minima and maxima as well as interquantile range (25% - 75%).

Source: EU KLEMS data; WIFO calculations.

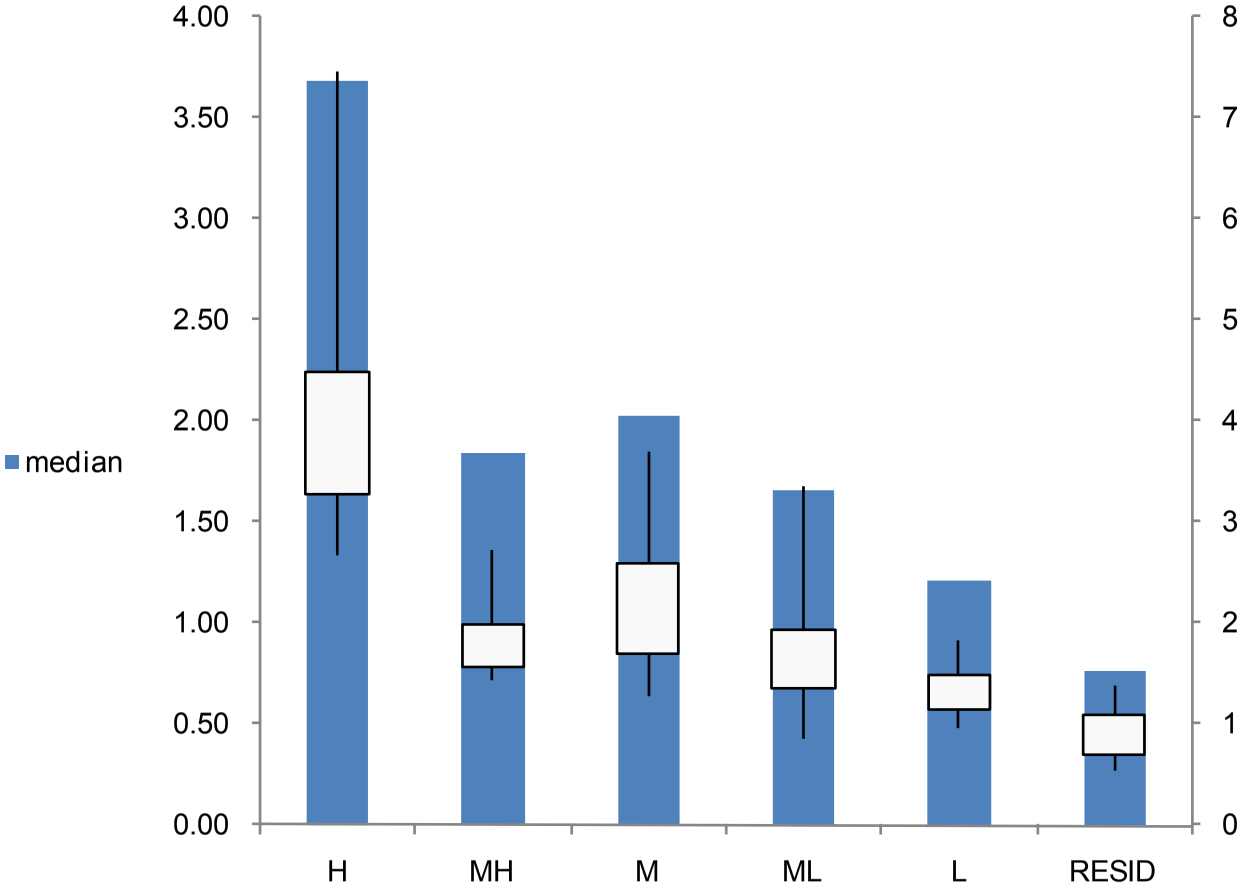
Figure 32 (b): Volatility of VA growth of sector groups relative to aggregate volatility across countries: Sectors by educational intensity



Note: Legend education intensity taxonomy: H: high; MH: medium high; I: intermediate; L: low; VL: very low. Boxplots show minima and maxima as well as interquantile range (25% - 75%).

Source: EU KLEMS data; WIFO calculations.

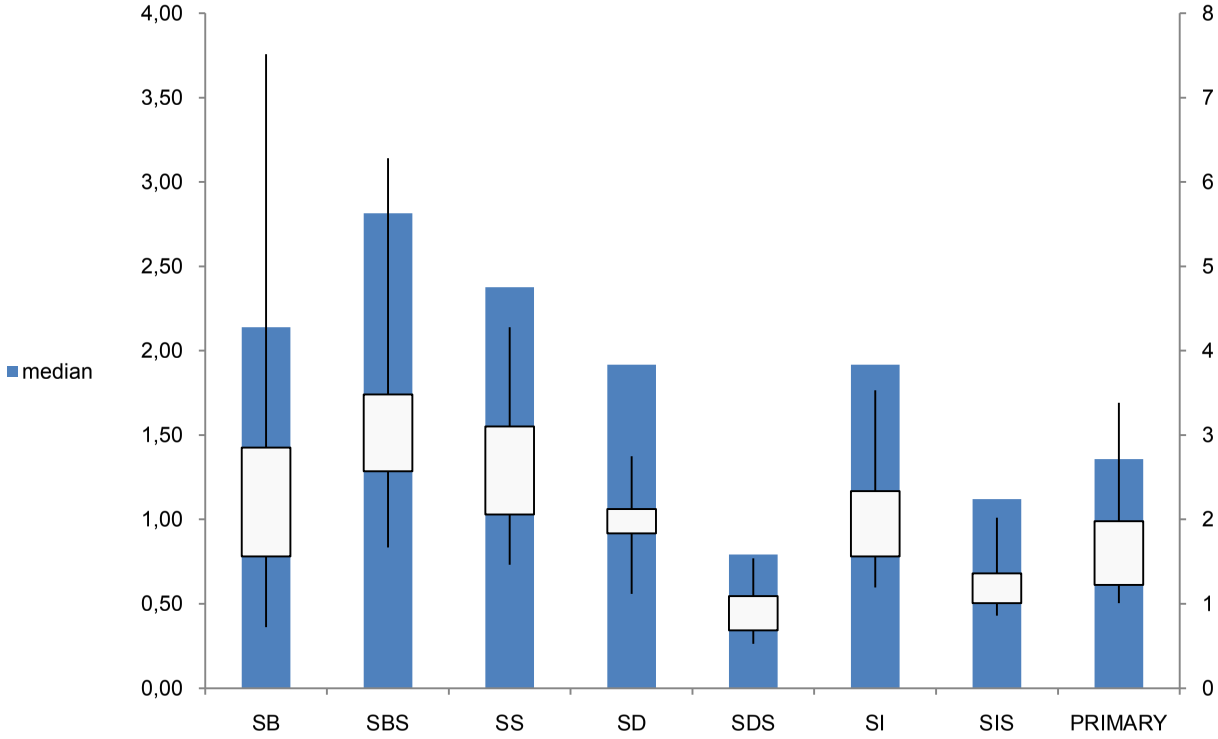
Figure 32 (c): Volatility of VA growth of sector groups relative to aggregate volatility across countries: sectors by innovation intensity (Peneder)



Note: Legend innovation mode taxonomy: H: high innovation intensity; MH: medium-high innovation intensity; M: medium innovation intensity; ML: medium low innovation intensity; L:low innovation intensity; RESID: other not classified industries. Boxplots show minima and maxima as well as interquantile range (25% - 75%).

Source: EU KLEMS data; WIFO calculations.

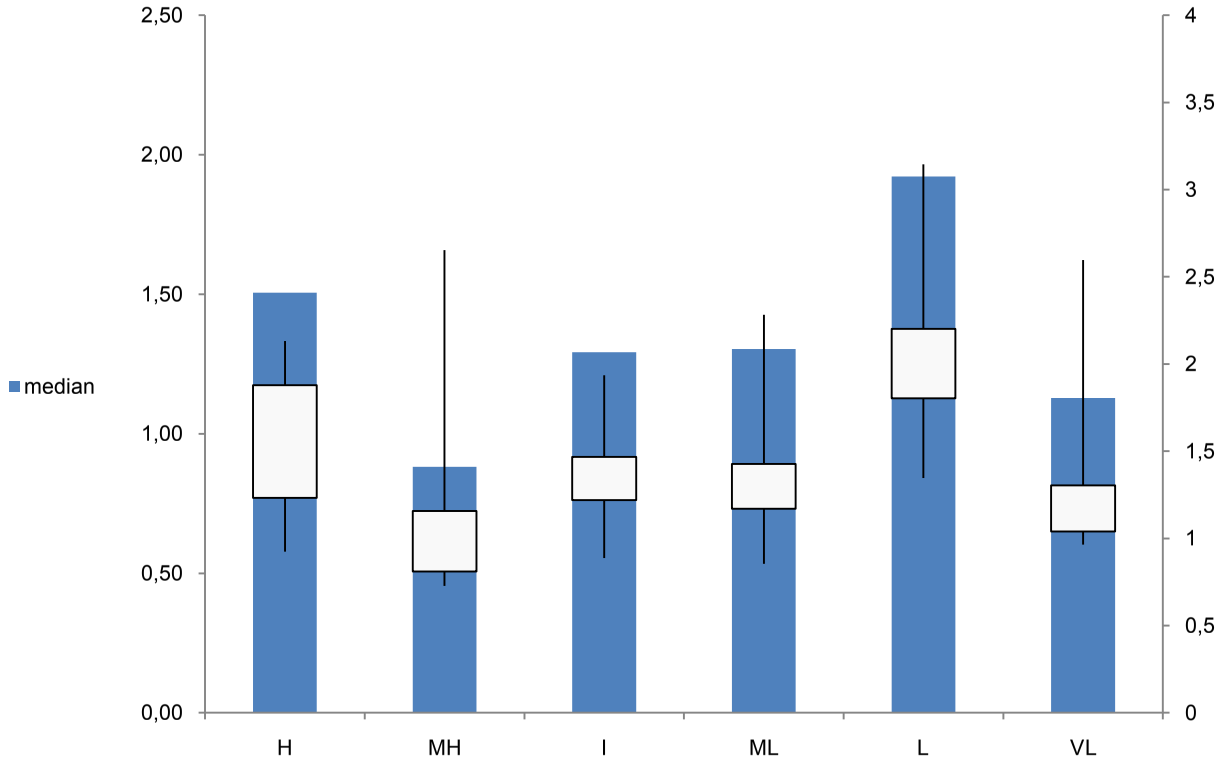
Figure 32 (d): Volatility of employment growth of sector groups relative to aggregate volatility across countries: sectors by innovation mode (Pavitt)



Note: Legend innovation mode taxonomy: SB: science based; SBS: science based services; SS: specialised suppliers; SD: supplier dominated; SDS: supplier dominated services; SI: scale intense industries. Boxplots show minima and maxima as well as interquantile range (25% - 75%).

Source: EU KLEMS data; WIFO calculations.

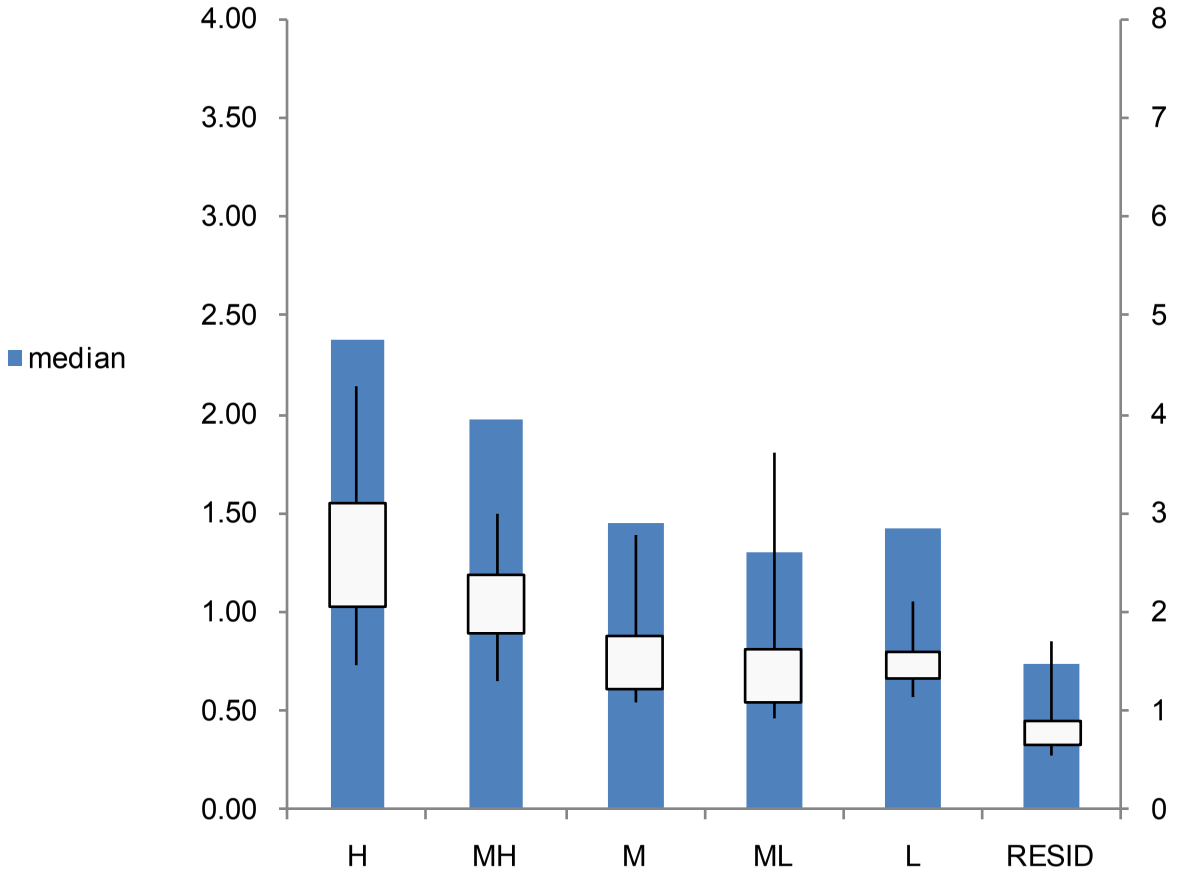
Figure 32 (e): Volatility of employment growth of sector groups relative to aggregate volatility across countries: Sectors by educational intensity



Note: Legend education intensity taxonomy: H: high; MH: medium high; I: intermediate; L: low; VL: very low. Boxplots show minima and maxima as well as interquantile range (25% - 75%).

Source: EU KLEMS data; WIFO calculations.

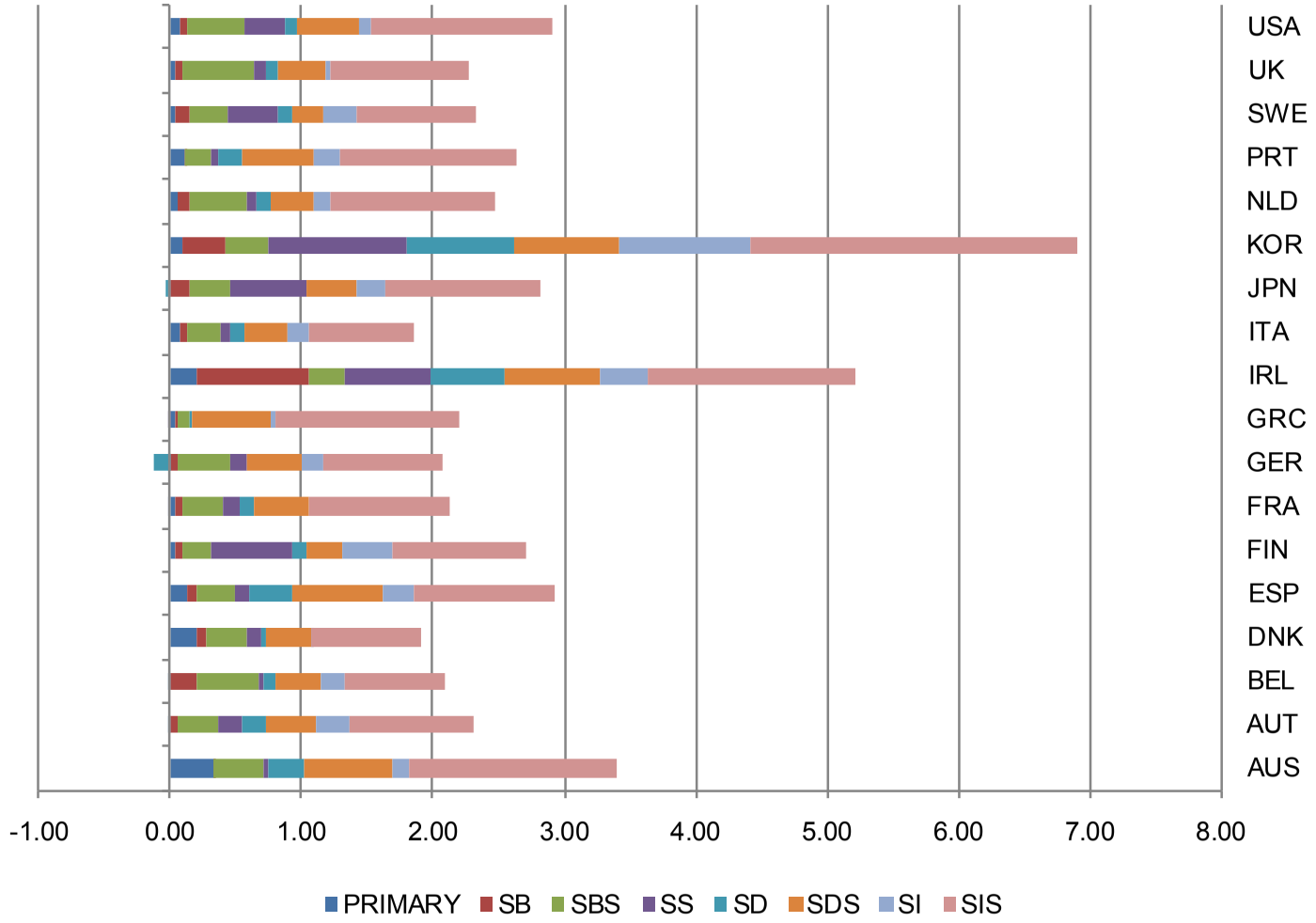
Figure 32 (f): Volatility of employment growth of sector groups relative to aggregate volatility across countries: sectors by innovation intensity (Peneder)



Note: Legend innovation mode taxonomy: H: high innovation intensity; MH: medium-high innovation intensity; M: medium innovation intensity; ML: medium low innovation intensity; L: low innovation intensity; RESID: other not classified industries. Boxplots show minima and maxima as well as interquantile range (25% - 75%).

Source: EU KLEMS data; WIFO calculations.

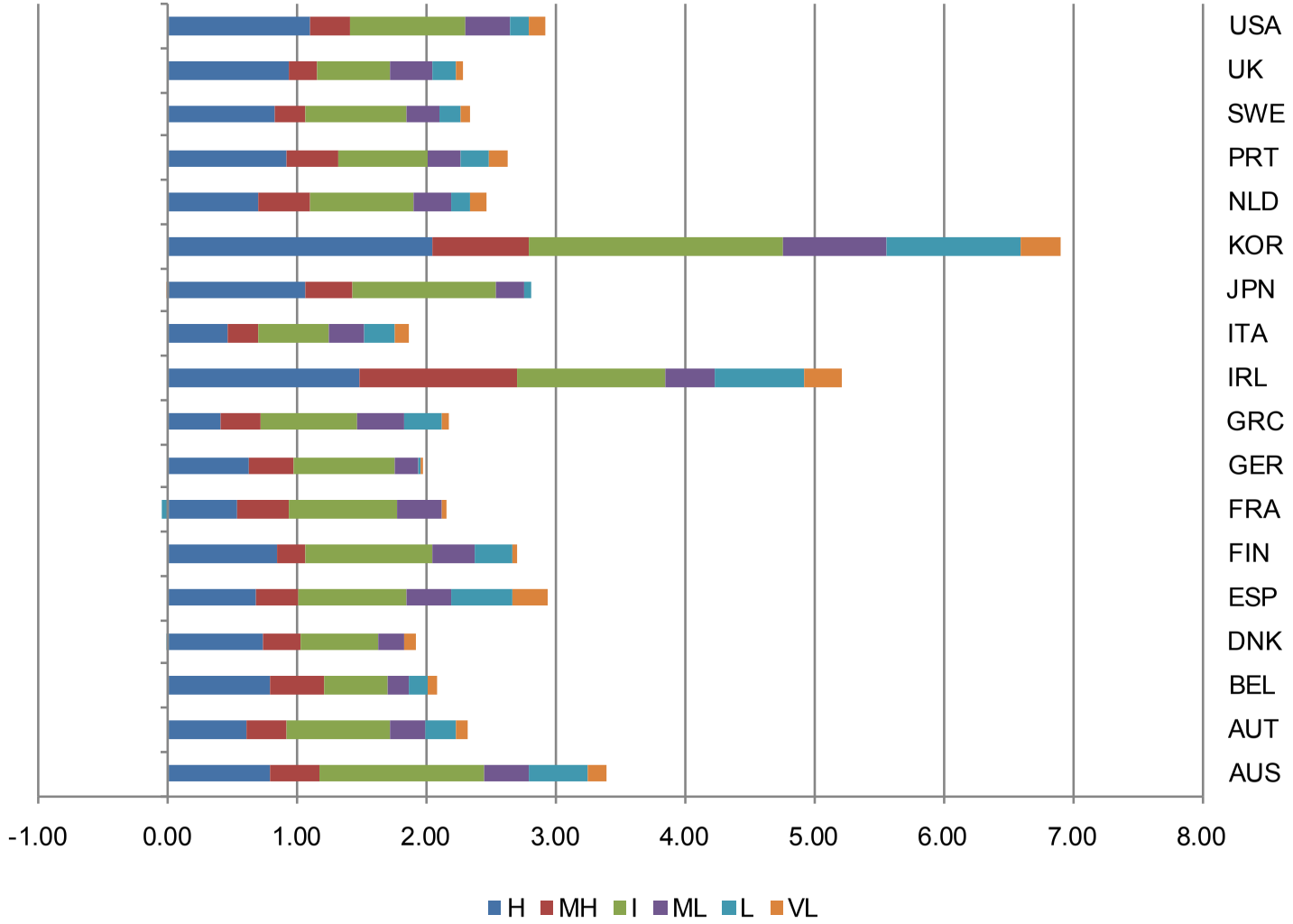
Figure 33 (a): Sector contribution to the growth rate of value added; sectors classified by innovation mode (Pavitt)



Note: Legend innovation mode taxonomy: SB: science based; SBS: science based services; SS: specialised suppliers; SD: supplier dominated; SDS: supplier dominated services; SI: scale intense industries.

Source: EU KLEMS data; WIFO calculations.

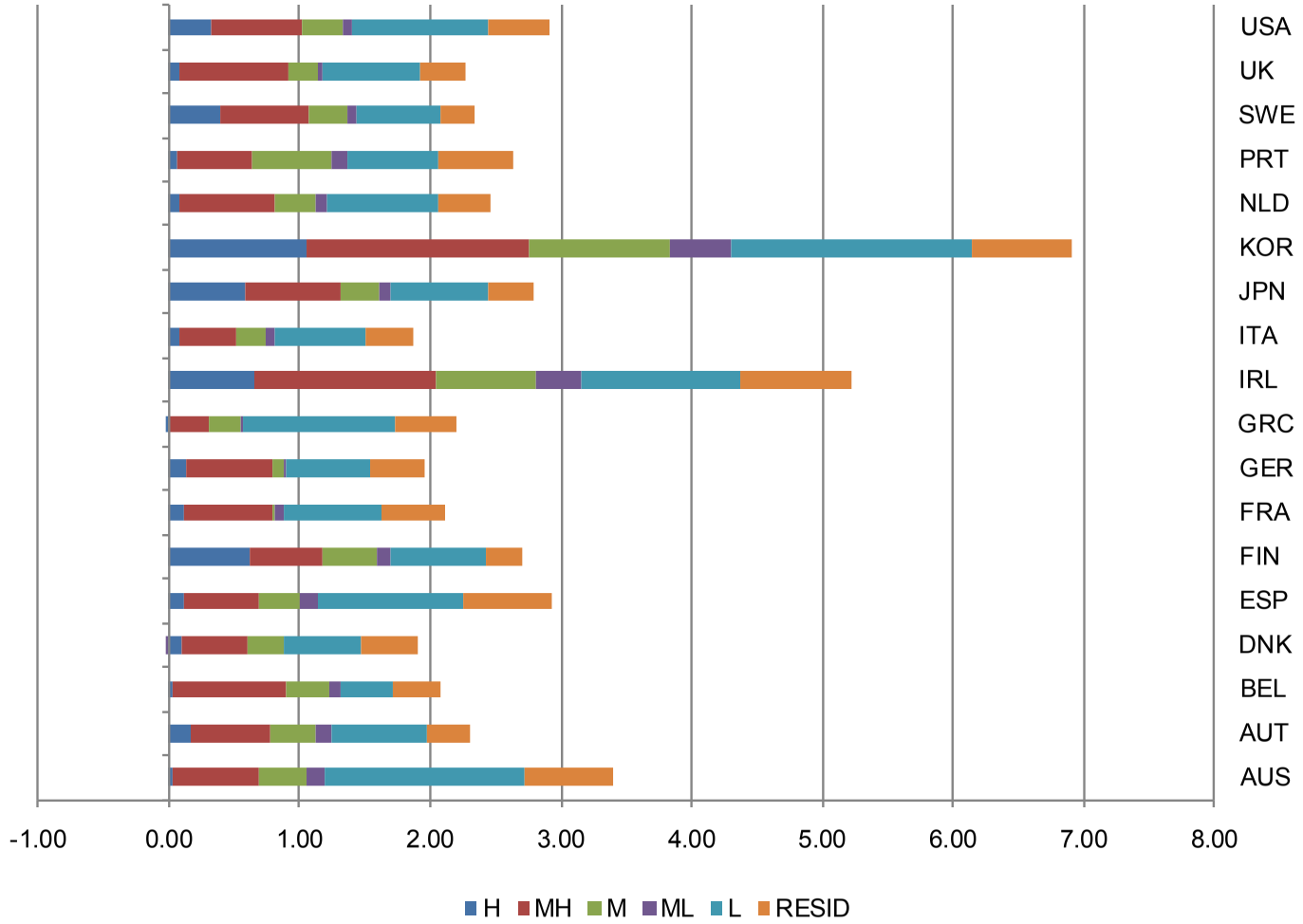
Figure 33 (b): Sector contribution to the growth rate of value added; sectors classified by educational intensity.



Note: Legend education intensity taxonomy: H: high; MH: medium high; I: intermediate; L: low; VL: very low.

Source: EU KLEMS data; WIFO calculations.

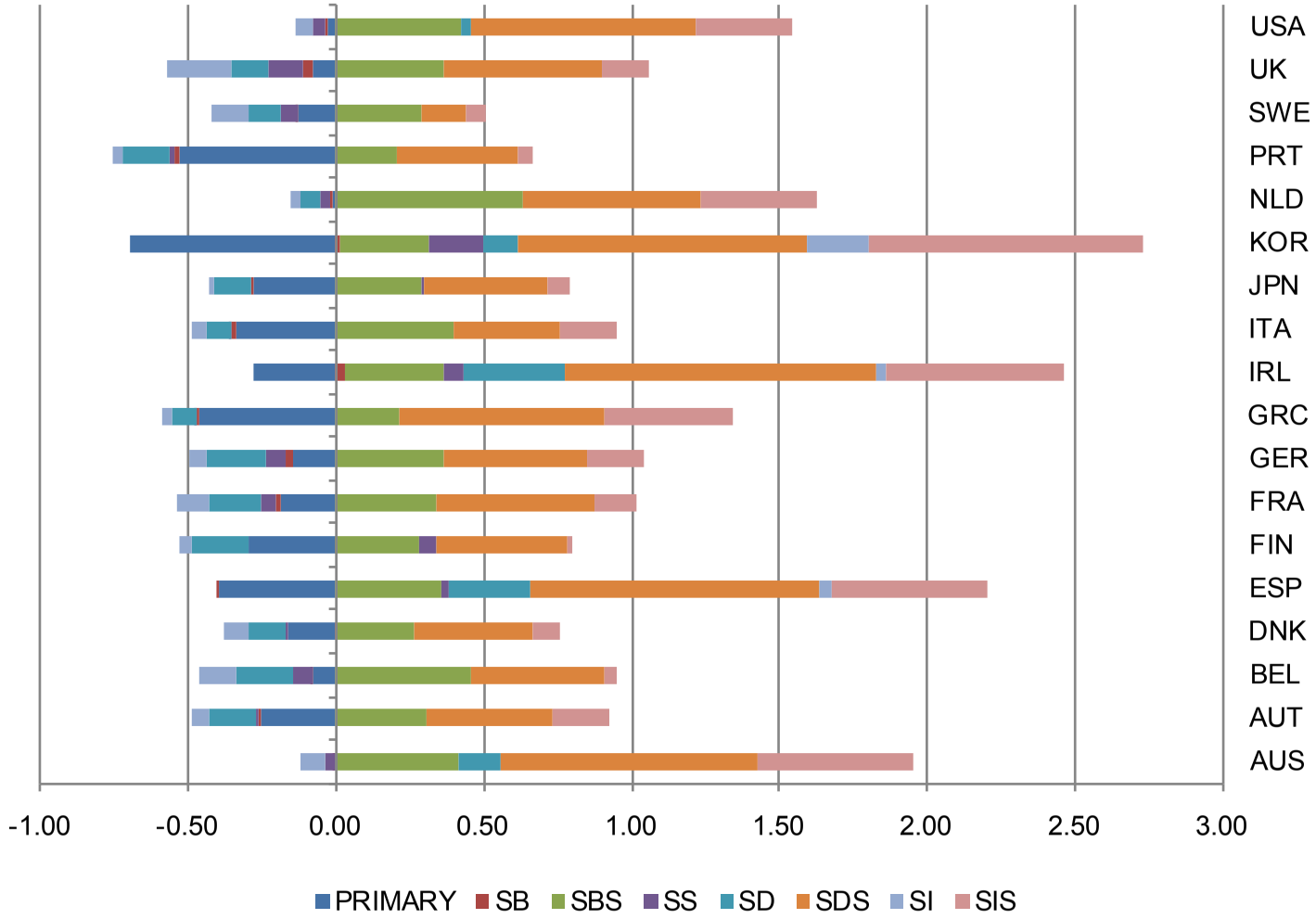
Figure 33 (c): Sector contribution to the growth rate of value added; sectors classified by innovation intensity (Peneder)



Note: Legend innovation mode taxonomy: H: high innovation intensity; MH: medium-high innovation intensity; M: medium innovation intensity; ML: medium low innovation intensity; L: low innovation intensity; RESID: other not classified industries.

Source: EU KLEMS data; WIFO calculations.

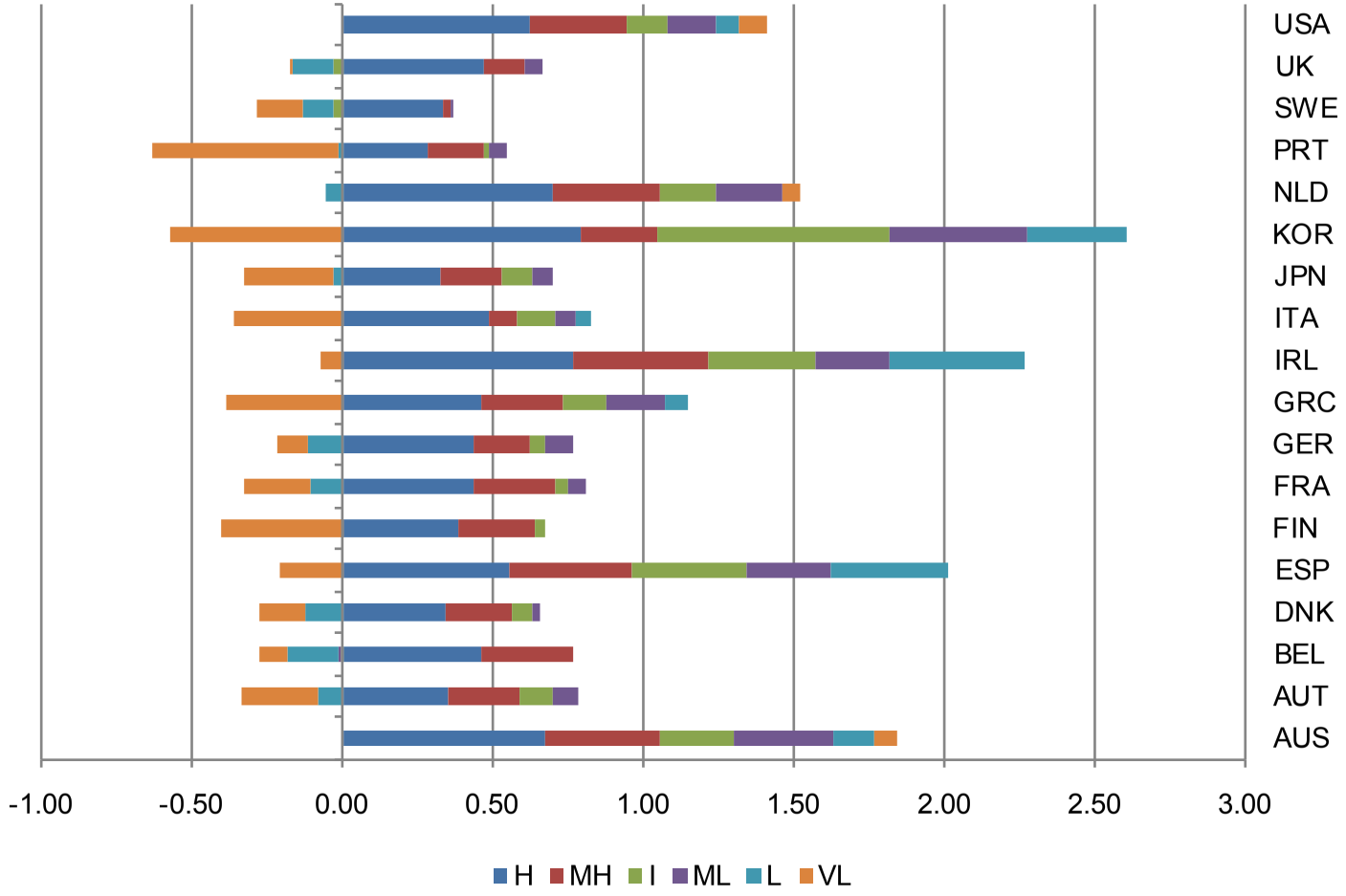
Figure 33 (d): Sector contribution to the growth rate of employment. Sectors classified by innovation mode (Pavitt)



Note: Legend innovation mode taxonomy: SB: science based; SBS: science based services; SS: specialised suppliers; SD: supplier dominated; SDS: supplier dominated services; SI: scale intense industries.

Source: EU KLEMS data; WIFO calculations.

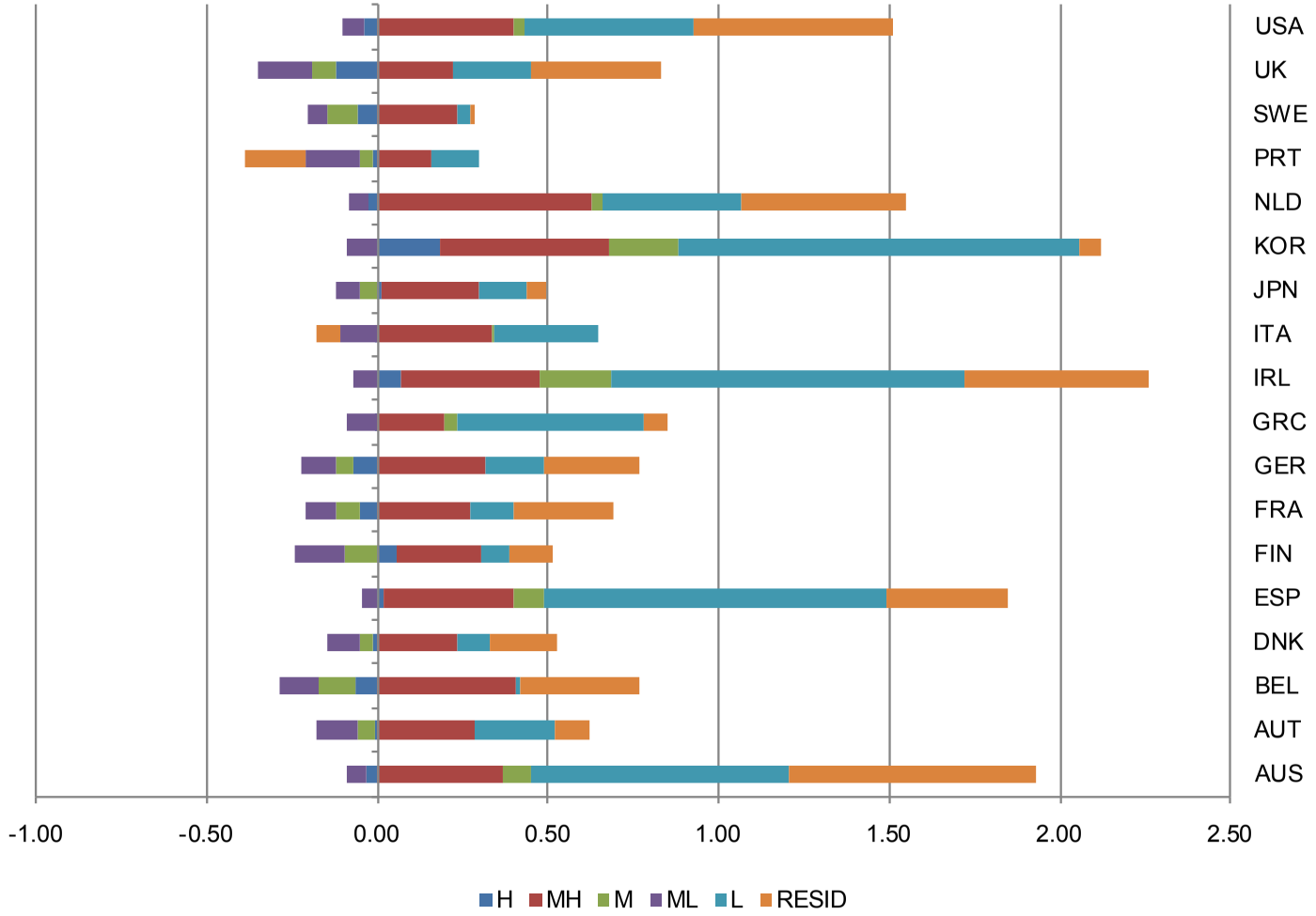
Figure 33 (e): Sector contribution to the growth rate of employment; sectors classified by educational intensity



Note: Legend education intensity taxonomy: H: high; MH: medium high; I: intermediate; L: low; VL: very low.

Source: EU KLEMS data; WIFO calculations.

Figure 33 (f): Sector contribution to the growth rate of employment. Sectors classified by innovation intensity (Peneder)



Note: Legend innovation mode taxonomy: H: high innovation intensity; MH: medium-high innovation intensity; M: medium innovation intensity; ML: medium low innovation intensity; L: low innovation intensity; RESID: other not classified industries.

Source: EU KLEMS data; WIFO calculations.

Figure 33 (a through f) shows that aggregate value added growth across countries is mainly driven by the service sector and here particularly by scale intense services (e.g. financial intermediation, real estate, telecom, wholesale and retail trade) and supplied dominated services (e.g. education, health, public administration). Among technology intense sectors (SB, SBS, SS) science based service industries (largely business services) dominate in terms of their contribution to valued added growth. However, the total contribution of technology intense industries to aggregate value added growth is rather small if compared to the service sector. An interesting picture emerges when we look at the contribution of industries with high to intermediate educational intensity to aggregate growth in value added growth. Clearly most of value added growth comes out of industries with high educational intensity. The contribution of industries with low skill intensity is almost negligible.[20].

Looking at the contribution of sector groups to aggregate employment growth we see that employment is largely created in the service industries. Science based services and in some countries specialised supplier industries are important contributors to job creation. The contribution of the manufacturing industries (and amongst them also technology intense industries) to employment growth is negative in most countries. If we analyse the contribution to aggregate employment growth using industry classification based on educational intensity an interesting dichotomy emerges. In industries with very low educational intensity employment growth is negative across all countries (with the exception of the USA, Australia and the Netherlands). However, the contribution to aggregate employment growth is positive in both industries with high to intermediate educational intensity as well as in industries with medium low and low educational intensity. This latter aspect is due to the positive employment growth in some scale intensive service sectors such as transport or retail trade. Sectors with medium to high innovation intensity have across all countries high contributions to value added and employment growth, however, the patterns are not clear. Innovation intense sectors do not seem to be in general the principal drivers of employment and value added growth. Furthermore, the strongest contributions to value added and employment growth within these classes come from innovation intensive services.

If we sum up the evidence presented in this section the results show that technology intensive industries display high volatility. However, industries with low educational intensity tend to display even higher volatility. Looking at the contribution to aggregate value added and employment growth the results indicate that the total contribution of technology intense industries to aggregate value added growth is rather small if compared to the service sector. Employment is also largely created in the service industries. Among the technology intense sectors the science based service industries (business services) dominate in terms of their contribution to valued added growth. Industries with high educational intensity such as

[20] It has to be kept in mind that the figures presented here represent weighted contributions of the sectors to the country performance. The values shown in the figures therefore reflect both sector influence (importance of an industry in a country) and sector performance (performance of an industry in a country).

financial intermediation contribute the highest share to aggregate value added growth. The results also show that for both industries with high to intermediate educational intensity as well as in industries with medium low and low educational intensity the contribution to aggregate employment growth is positive. Employment growth has been negative in industries with very low educational intensity.

Two additional remarks are in place. The high contribution of service sectors to value added is largely dependent on value added generated in other sectors in each country. A considerable part of services is also generated in the public sector. Without the constant growth of value added and by implication also tax revenue in other sectors the fast expansion of the services sector would be unthinkable. The developments shown in Figure 33(a-f) capture also what is known as Baumol's disease (Baumol 1967), i.e. the observation that it is systematically more difficult to improve productivity in services vis-a-vis traditional manufacturing industries, such that a reallocation of employment from the latter to the former takes place.

7.6. Concluding remarks

The aim of this report was to assess to what extent knowledge and technology intense sectors are exposed to the business cycle, to what extent technology and skill intensive sectors contribute to aggregate volatility as well as to growth in value added and employment across countries, and what role business cycles play in the long run development of industries as opposed to those factors driving structural change.

The results show that the level of impact of business cycles on value added and employment growth varies greatly across industries. The industries in which business cycles have the strongest impacts are business service ("71t74") and the metal industry ("26"). The business services sector also includes R&D services. The sectors that are the least affected are those industries related to the public sector (education, health, public administration). The effects of economic downturns and upswings are asymmetric. In economic downturns valued added and employment fall more sharply across sectors than they grow during upswings. In general the results show that business cycles have a strong impact on technology intense industries. However, fluctuations in aggregate output have the most pronounced impact on those industries with low educational intensity.

These findings are also reflected in the analysis of the volatility of technology and skill intensive sectors relative to the aggregate volatility in the growth of value added and employment across countries. Technology intensive industries react considerably more strongly to aggregate variations in output. Looking at the issue in terms of educational intensity the analysis shows that industries with low educational intensity tend to react to aggregate fluctuations in value added and employment growth more than any other industry group. When interpreting these results one has to bear in mind that several sectors with a high education intensity are service sectors related to public services and public administration and, as our results indicate, these even fluctuate anti-cyclically.

The results indicate that the total contribution of technology intense industries to aggregate value added growth is rather small if compared to the service sector where the largest shares of aggregate employment growth also originate. Among the technology intense sectors the science based service industries (business services) make the largest contribution to valued added growth. In both industries with high to intermediate educational intensity as well as in industries with medium low and low educational intensity the contribution to aggregate employment growth is positive. Employment growth was negative in industries with very low educational intensity.

When interpreting these results it is important to remind ourselves that the high contribution of service sectors, and especially public services, to value added depends also heavily on value added generated in other sectors in each country. Without the constant growth of value added and by implication also tax revenue in other sectors the fast expansion of the services sector would not be possible. The development of the contribution of the different sectors to aggregate growth are demonstrated by Baumol's disease, i.e. the observation that it is systematically more difficult to improve productivity in services vis-a-vis traditional manufacturing industries so that employment is reallocated from the latter to the former.

The overall importance of business cycles for long run growth at the industry level is rather limited. The results indicate that sector specific changes in productivity and demand that are not related to short run cyclical variations considerably outweigh the impact induced by business cycles on long-run industry performance. They are, on average, across industries and countries between five to eight times larger. The factors driving structural change are considerably more important for long run industry performance than short run variations in aggregate output growth.

However, despite the impact of the business cycle being small in all cases it is almost always statistically significant namely 1% across sectors and countries for both value added and employment growth when the business cycle indicator changes by one standard deviation. This would hint at the persistent effect of business cycles on sectoral performance indicators. Technology intense industries are among those industries in which long-rung growth in value added and to a lesser extent in employment is most strongly affected by cyclical variations. Our findings therefore support the arguments put forward by the OECD in favour of supporting these industries during sharp economic downturns.

8. COMPLEXITY AND COMPETITIVENESS: TESTING A NEW TAXONOMY

The industrial classifications we have used so far in this report usually focus on a single dimension of industrial in- or output (research spending, education, innovation....). It is thus interesting to compare these classifications to one which reflects a broader range of firm capabilities required for production, a product or industry characterisation by complexity of the product or the production process. Of course, the broad concept of complexity implies a qualitative characterisation of products or industries as opposed to the quantitative (clustering) concepts underlying the other taxonomies used in this report.

Several authors in the 1990s have argued that as global competition increases success in developing and supplying complex technological products will be a crucial factor for the ability of advanced societies to maintain a high standard of living (see e.g. Rothwell 1993, Hayes 1996). Rycroft and Kash (1999) have therefore analysed the principal trade patterns according to the technological complexity underlying the 30 most traded goods, first including commodities and agricultural products and second for manufactured goods only in 1995. These goods are presented in Table 31 and Table 28. In 1995 they covered 46% of world trade (Rycroft and Kash 1999, p. 8). Rycroft and Kash (1999) found that between 1970 and 1995 the share in exports of complex products produced by complex production processes had increased from 38% to 56%. From this they conclude that complex products have indeed become a major driver of competitive advantage. In the present exercise we reconsider their findings, by looking at how global trade has developed for the thirty products that were most traded in 1995 in the subsequent years.

Figure 34 and Figure 35 give an overview on how world trade in the 30 most traded goods (all goods, including agriculture and commodities, and manufacturing goods only) of the year 1995) was split among the EU 27 and other important economic regions (China, BRI (Brazil, Russia, India), Japan, USA) in 2009. As these figures show the EU 27 has a high share in trade both in complex products produced with complex processes and simple products produced with complex production processes. Especially in the latter category the world trade share of EU 27 countries is particularly high. The difference between all top 30 goods and the top 30 manufactured goods is almost negligible. It is important to notice that especially China has a higher share in world trade in complex products than any other country or country group. The share of the BRI countries is high in simple products produced with simple processes. A comparison with the same figure considering manufactured goods only hint at the high trade volume these countries have in raw materials. If we look at the trade shares of manufactured products only, then again China stands out as the dominating trading country for simple manufactured goods produced by simple processes. The EU 27 countries have instead a dominant role in simple manufactured products produced through complex processes.

Table 30 provides some summary information on how the shares shown in Figure 34 and Figure 35 have changed with respect to 1999 and to 2007. One can see that in the category comprising all traded goods the EU 27 were able to maintain a constant trade share since 1999 in the product category of complex products produced with complex processes. Japan and the USA have lost considerable market share in this product category, whereas all BRIC countries

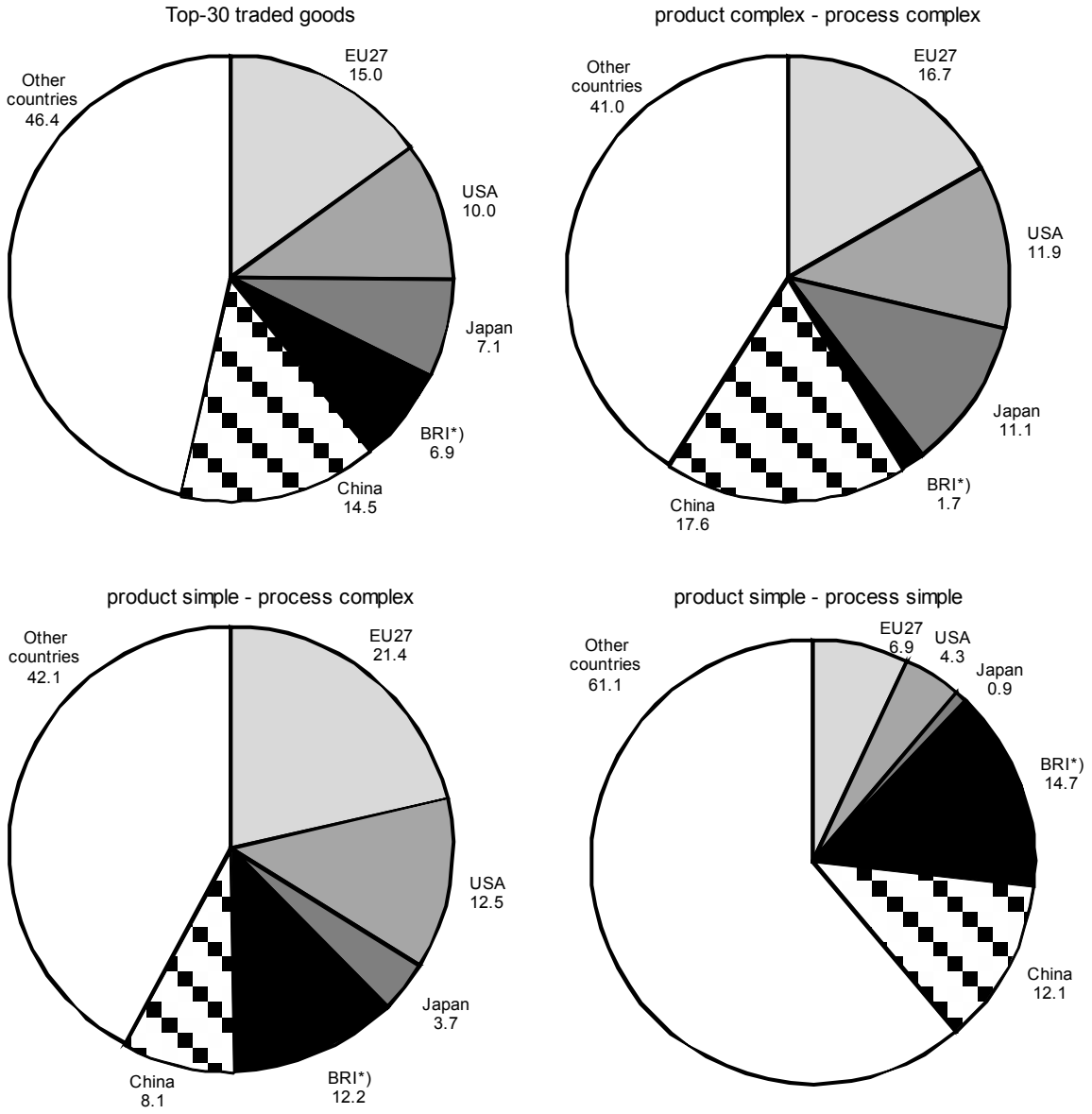
have considerably increased their share. Especially India and China stand out. India has increased its market share quickly but starting from a very low basis. Things are more drastic for China: here the trade share in complex products produced by complex processes has skyrocketed and increased by a factor of 6.5 since 1999 reaching its high share of 17,6% in 2009. Figure 36 illustrates this. Also for simple products produced by complex processes the EU 27 countries could maintain their world market share over the past decade. Japan and the USA have instead lost world market shares drastically in simple products produced by complex processes. The world market share in simple products produced by simple processes has essentially halved for the EU 27 over the period 1999-2009. China, Russia, Brazil, and India have increased their world market share in this product category as well. Looking at manufactured goods only, the overall picture changes little. However, it indicates that since 1999 the EU 27 could even increase their market share in simple products produced by complex processes.

Table 31 shows the data for the four basic country groups inside the EU used in our other analyses, including intra-EU trade. The countries of group 1 and 2 have lost shares in the top 30, while the countries of group 3 and 4 have instead increased their share in the top 30 traded products. The structure of trade according to the relative shares displays a picture similar to our other taxonomies (cf. Table 9 and 11): groups 1 and 3 feature higher shares in product classes referring either to complex products or processes, whereas groups 2 and 4 feature higher shares in product classes referring to simple products and processes.

Overall the evidence shows that the EU 27 countries have been able to maintain relatively stable market shares both in complex products produced by complex processes and simple products produced by complex processes. The USA and Japan have lost their market share in these product categories drastically. Most impressive is the steep ascend of China not only in the simple products produced with simple processes but most importantly also in the category of complex products produced by complex processes.

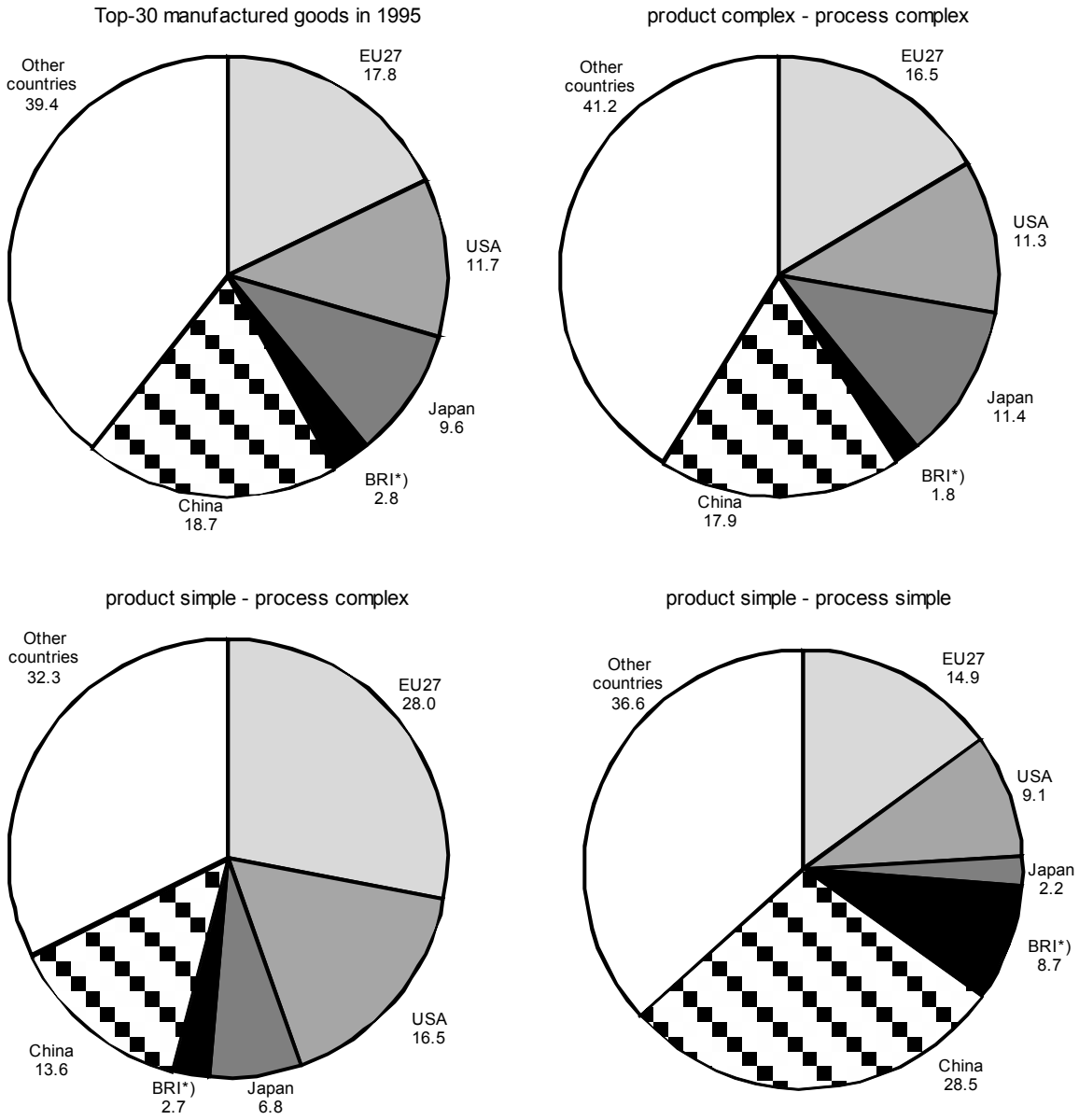
In conclusion, aggregating components of goods trade by their degree of complexity adds an interesting dimension to the analysis of the linkages between structural change and competitiveness. The fact that it is correlated with the other taxonomies implies that the product and process features of complexity must be linked to characteristics such as research spending, innovation and education intensity. This comes as another confirmation that we do not just produce statistical artefacts by focusing on quantitative characterisations of industries, as the other classifications receive support from more qualitative accounts of product or industry characteristics.

Figure 34: World export market shares in goods traded globally as percent, 2009



Source: UNO (Comtrade). – Excluding intra-EU exports. - World: 117 countries covering approximately 90 percent of world trade. - *) Brazil, Russia, India.

Figure 35: World export market shares in manufactured goods traded globally as percent, 2009



Source: UNO (Comtrade). – Excluding intra-EU exports. - World: 117 countries covering approximately 90 percent of world trade. - *) Brazil, Russia, India.

Table 30: World export market share as percent 2009, and index 2009 (1999=100, 2007=100)

	EU27			USA			Japan			Brazil			Russia			India			China		
	2009	1999=10	2007=10	2009	1999=10	2007=10	2009	1999=10	2007=10	2009	1999=10	2007=10	2009	1999=10	2007=10	2009	1999=10	2007=10	2009	1999=10	2007=10
All goods																					
Joint class 1	16.7	100.4	98.5	11.9	51.0	78.0	11.1	66.0	86.8	0.8	125.2	89.0	0.2	121.8	94.5	0.7	689.1	229.6	17.6	647.0	122.4
Joint class 3	21.4	99.2	96.7	12.5	80.8	119.1	3.7	59.4	101.9	0.9	119.5	83.5	7.2	229.4	93.7	4.1	1,006.4	106.4	8.1	219.5	112.4
Joint class 4	6.9	57.2	92.6	4.3	55.4	104.3	0.9	36.6	91.7	1.8	174.1	107.8	10.5	206.4	96.1	2.4	99.2	139.2	12.1	163.6	115.8
Top-30	15.0	92.2	98.1	10.0	52.0	86.6	7.1	55.9	86.2	1.1	147.1	95.4	4.1	277.4	98.6	1.7	293.5	141.6	14.5	384.5	118.4
Manufactured goods																					
Joint class 1	16.5	97.7	96.1	11.3	49.5	76.1	11.4	66.8	88.5	0.8	122.0	84.8	0.2	100.5	90.3	0.8	790.8	241.8	17.9	643.8	124.4
Joint class 3	28.0	108.8	98.0	16.5	78.1	102.2	6.8	65.7	84.0	0.8	109.9	95.4	0.7	91.9	92.7	1.2	232.8	111.6	13.6	321.1	108.6
Joint class 4	14.9	80.3	89.8	9.1	79.1	96.6	2.2	51.0	88.6	1.2	80.1	85.4	2.0	88.3	81.7	5.4	135.3	134.9	28.5	231.0	112.5
Top-30	17.8	98.8	96.7	11.7	55.2	81.9	9.6	64.9	87.3	0.8	110.5	86.2	0.5	97.1	87.6	1.5	230.8	162.5	18.7	452.2	120.0

Joint class 1 = product complex, process complex; joint class 3 = product simple, process complex; joint class 4 = product simple, process simple.

Source: UNO (Comtrade). – Excluding intra-EU exports. - World: 117 countries covering approximately 90 percent of world trade.

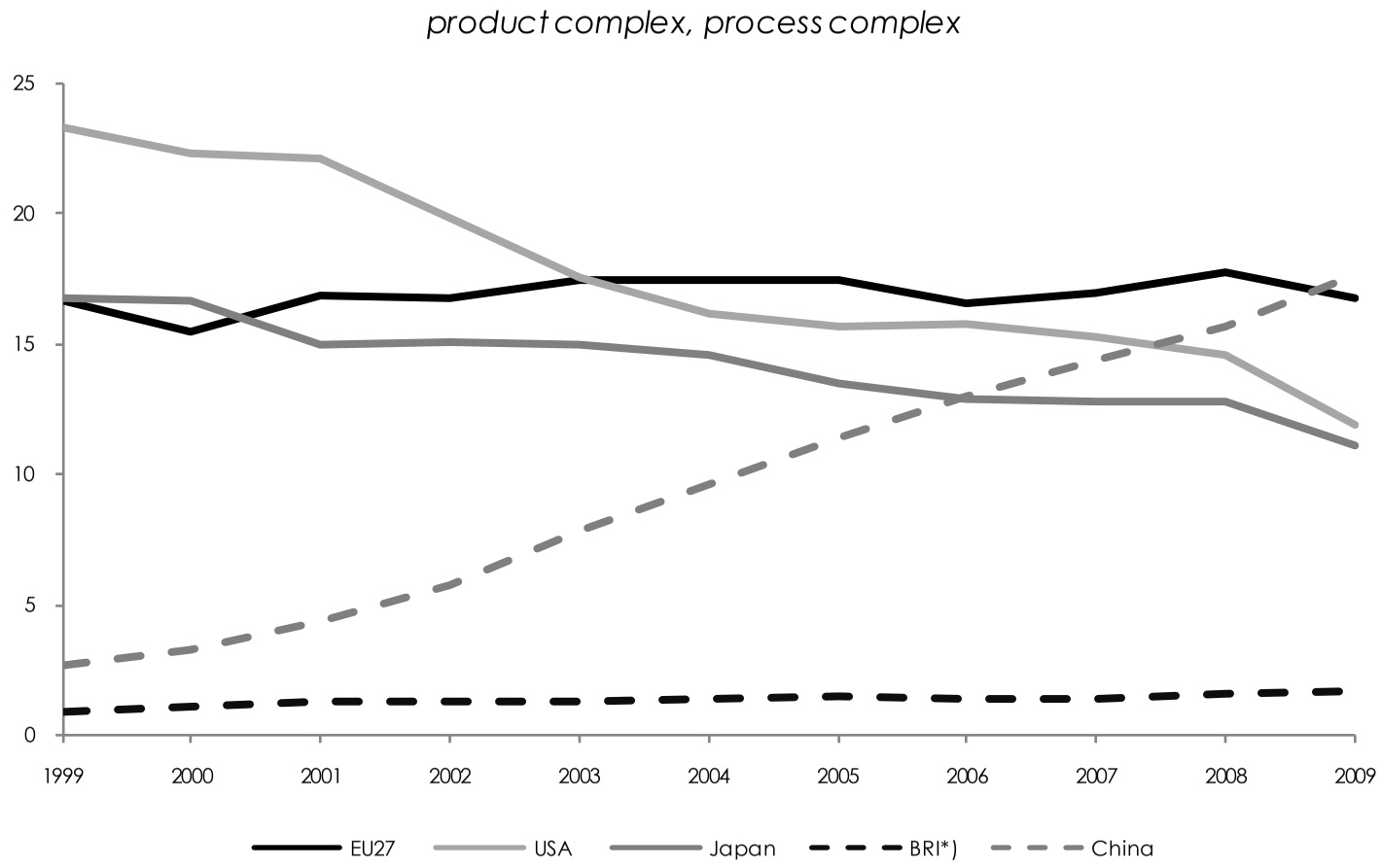
Table 31: Export share as percent 2009, and index 2009 (1999=100, 2007=100)

	EU27				Group 1				Group 2				Group 3				Group 4			
	2009	RS	1999 = 100	2007 = 100	2009	RS	1999 = 100	2007 = 100	2009	RS	1999 = 100	2007 = 100	2009	RS	1999 = 100	2007 = 100	2009	RS	1999 = 100	2007 = 100
Goods																				
Joint class 1	36,8	1,1	91,4	97,0	27,0	1,1	80,2	94,0	4,8	0,9	95,2	96,7	4,5	1,2	309,5	114,9	0,5	0,8	352,9	137,2
Joint class 3	42,8	1,2	88,4	95,5	32,3	1,3	84,3	96,3	6,8	1,3	84,7	90,3	2,5	0,7	162,3	97,3	1,2	1,7	250,7	101,6
Joint class 4	23,5	0,7	73,7	97,2	16,0	0,6	72,2	96,7	4,4	0,9	61,2	97,0	2,5	0,7	122,5	101,4	0,6	0,9	121,5	97,5
Top-30	34,8	1,0	87,4	97,0	25,4	1,0	78,9	95,3	5,1	1,0	87,6	96,0	3,6	1,0	231,5	109,0	0,7	1,0	262,4	116,9
Manufacturing goods																				
Joint class 1	36,0	0,9	89,6	95,1	26,2	0,9	78,3	92,1	4,8	0,8	94,8	95,1	4,4	1,0	297,1	112,8	0,6	0,9	343,8	135,7
Joint class 3	52,7	1,3	98,5	97,1	41,4	1,5	94,7	97,9	7,5	1,3	91,7	91,8	3,4	0,8	218,6	99,0	0,5	0,8	281,4	95,9
Joint class 4	40,0	1,0	93,4	95,1	25,0	0,9	89,3	94,3	8,9	1,5	80,7	95,4	4,9	1,1	158,1	99,1	1,3	1,9	159,8	95,8
Top-30	39,1	1,0	92,8	96,2	28,3	1,0	83,4	94,3	5,8	1,0	93,2	95,5	4,3	1,0	254,9	108,5	0,7	1,0	266,1	117,7

Joint class 1 = product complex, process complex; joint class 3 = product simple, process complex; joint class 4 = product simple, process simple. RS = Relative Share of Joint Class compared to top 30. - Group 1: Austria, Belgium, Denmark, Finland, France, German, Ireland, Netherlands, Sweden, United Kingdom. - Group 2: Cyprus, Greece, Italy, Luxembourg, Portugal, Spain Group 3: Czech Republic, Hungary, Poland, Malta, Slovakia, Slovenia. Group 4: Bulgaria, , Estonia, Latvia, Lithuania, , Romania.

Source: Eurostat (Comext), UNO (Comtrade). – Including intra-EU exports. - World: 117 countries covering approximately 90 percent of world trade -.

Figure 36: World export market shares as percent, 1999-2009: All goods.



Source: UNO (Comtrade) Excluding intra-EU exports. - World: 117 countries covering approximately 90 percent of world trade -*) BRI = Brazil, Russia, India.

.

Table 32: Top – 30 manufactured goods traded globally in 1995

CPA 2002	NACE 2 digit	SITC rev 3	Decription	product class	process class	joint class
3530	35	713	Internal combustion piston engines, and parts thereof, n.e.s.	complex	complex	1
2956	29	728	Other machinery and equipment specialized for particular industries; parts thereof, n.e.s.	complex	complex	1
3002	30	752	Automatic data-processing machines and units thereof; magnetic or optical readers, machines for transcribing data onto data media in coded form and machines for processing such data, n.e.s.	complex	complex	1
3001	30	759	Parts and accessories (other than covers, carrying cases and the like) suitable for use solely or principally with machines falling within groups 751 and 752	complex	complex	1
3220	32	764	Telecommunications equipment, n.e.s., and parts, n.e.s., and accessories of apparatus falling within division 76	complex	complex	1
3210	32	772	Electrical apparatus for switching or protecting electrical circuits or for making connections to or in electrical circuits (e.g., switches, relays, fuses, lightning arresters, voltage limiters, surge suppressors, plugs and sockets, lamp-holders and junction boxes); electrical resistors (including rheostats and potentiometers), other than heating resistors; printed circuits; boards, panels (including numerical control panels), consoles, desks, cabinets and other bases, equipped with two or more apparatus for switching, protecting or for making connections to or in electrical circuits, for electric control or the distribution of electricity (excluding switching apparatus of subgroup 764.1)	complex	complex	1
3210	32	776	Thermionic, cold cathode or photo-cathode valves and tubes (e.g., vacuum or vapour or gas-filled valves and tubes, mercury arc rectifying valves and tubes, cathode-ray tubes, television camera tubes); diodes, transistors and similar semiconductor devices; photosensitive semiconductor devices; light-emitting diodes; mounted piezoelectric crystals; electronic integrated circuits and microassemblies; parts thereof	complex	complex	1
2941	29	778	Electrical machinery and apparatus, n.e.s.	complex	complex	1
3410	34	781	Motor cars and other motor vehicles principally designed for the transport of persons (other than motor vehicles for the transport of ten or more persons, including the driver), including station-wagons and racing cars	complex	complex	1
3410	34	782	Motor vehicles for the transport of goods and special-purpose motor vehicles	complex	complex	1
3410	34	784	Parts and accessories of the motor vehicles of groups 722, 781, 782 and 783	complex	complex	1
3530	35	792	Aircraft and associated equipment; spacecraft (including satellites) and spacecraft launch vehicles; parts thereof	complex	complex	1
3511	35	793	Ships, boats (including hovercraft) and floating structures	complex	complex	1
3320	33	874	Measuring, checking, analysing and controlling instruments and apparatus, n.e.s.	complex	complex	1
2441	24	541	Medicinal and pharmaceutical products, other than medicaments of group 542	simple	complex	3

2521	25	583	Monofilament of which any cross-sectional dimension exceeds 1 mm, rods, sticks and profile shapes, whether or not surface-worked but not otherwise worked, of plastics	simple	complex	3
2442	24	598	Miscellaneous chemical products, n.e.s.	simple	complex	3
2112	21	641	Paper and paperboard	simple	complex	3
2710	27	674	Flat-rolled products of iron or non-alloy steel, clad, plated or coated	simple	complex	3
2924	29	741	Heating and cooling equipment, and parts thereof, n.e.s.	simple	complex	3
2922	29	744	Mechanical handling equipment, and parts thereof, n.e.s.	simple	complex	3
2956	29	749	Non-electric parts and accessories of machinery, n.e.s.	simple	complex	3
2523	25	893	Articles, n.e.s., of plastics	simple	complex	3
500	5	667	Pearls and precious or semiprecious stones, unworked or worked	simple	simple	4
2742	27	684	Aluminium	simple	simple	4
2874	28	699	Manufactures of base metal, n.e.s.	simple	simple	4
3611	36	821	Furniture and parts thereof; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings	simple	simple	4
1822	18	843	Men's or boys' coats, capes, jackets, suits, blazers, trousers, shorts, shirts, underwear, nightwear and similar articles of textile fabrics, knitted or crocheted (other than those of subgroup 845.2)	simple	simple	4
1930	19	851	Footwear	simple	simple	4
3663	36	894	Baby carriages, toys, games and sporting goods	simple	simple	4

Source: Rycroft and Kash (1999). The Complexity Challenge, Pinter Publ., London, Appendix p.224 ff.

Table 33: Top – 30 traded goods globally in 1995

CPA 2002	NACE 2 digit	SITC rev3	Description	product class	process class	joint class
3530	35	713	Internal combustion piston engines, and parts thereof, n.e.s.	complex	complex	1
2943	29	728	Other machinery and equipment specialized for particular industries; parts thereof, n.e.s.	complex	complex	1
3002	30	752	Automatic data-processing machines and units thereof; magnetic or optical readers, machines for transcribing data onto data media in coded form and machines for processing such data, n.e.s.	complex	complex	1
3001	30	759	Parts and accessories (other than covers, carrying cases and the like) suitable for use solely or principally with machines falling within groups 751 and 752	complex	complex	1
3220	32	764	Telecommunications equipment, n.e.s., and parts, n.e.s., and accessories of apparatus falling within division 76	complex	complex	1
3210	32	772	Electrical apparatus for switching or protecting electrical circuits or for making connections to or in electrical circuits (e.g., switches, relays, fuses, lightning arresters, voltage limiters, surge suppressors, plugs and sockets, lamp-holders and junction boxes); electrical resistors (including rheostats and potentiometers), other than heating resistors; printed circuits; boards, panels (including numerical control panels), consoles, desks, cabinets and other bases, equipped with two or more apparatus for switching, protecting or for making connections to or in electrical circuits, for electric control or the distribution of electricity (excluding switching apparatus of subgroup 764.1)	complex	complex	1
3210	32	776	Thermionic, cold cathode or photo-cathode valves and tubes (e.g., vacuum or vapour or gas-filled valves and tubes, mercury arc rectifying valves and tubes, cathode-ray tubes, television camera tubes); diodes, transistors and similar semiconductor devices; photosensitive semiconductor devices; light-emitting diodes; mounted piezoelectric crystals; electronic integrated circuits and microassemblies; parts thereof	complex	complex	1
3140	31	778	Electrical machinery and apparatus, n.e.s.	complex	complex	1
3410	34	781	Motor cars and other motor vehicles principally designed for the transport of persons (other than motor vehicles for the transport of ten or more persons, including the driver), including station-wagons and racing cars	complex	complex	1
3410	34	782	Motor vehicles for the transport of goods and special-purpose motor vehicles	complex	complex	1
3410	34	784	Parts and accessories of the motor vehicles of groups 722, 781, 782 and 783	complex	complex	1
3530	35	792	Aircraft and associated equipment; spacecraft (including satellites) and spacecraft launch vehicles; parts thereof	complex	complex	1
3320	33	874	Measuring, checking, analysing and controlling instruments and apparatus, n.e.s.	complex	complex	1
2320	23	334	etroleum oils and oils obtained from bituminous minerals (other than crude); preparations, n.e.s., containing by weight 70% or more of petroleum oils or of oils obtained from bituminous minerals, these oils being the basic constituents of the preparations	simple	complex	3

2441	24	541	Medicinal and pharmaceutical products, other than medicaments of group 54	simple	complex	3
2521	25	583	Monofilament of which any cross-sectional dimension exceeds 1 mm, rods, sticks and profile shapes, whether or not surface-worked but not otherwise worked, of plastics	simple	complex	3
2125	21	641	Paper and paperboard	simple	complex	3
2710	27	674	Flat-rolled products of iron or non-alloy steel, clad, plated or coated	simple	complex	3
2921	29	741	Heating and cooling equipment, and parts thereof, n.e.s.	simple	complex	3
2956	29	749	Non-electric parts and accessories of machinery, n.e.s.	simple	complex	3
2522	25	893	Articles, n.e.s., of plastics	simple	complex	3
121	01	11	Meat of bovine animals, fresh, chilled or frozen	simple	simple	4
1110	11	333	Petroleum oils and oils obtained from bituminous minerals, crude	simple	simple	4
500	05	667	Pearls and precious or semiprecious stones, unworked or worked	simple	simple	4
2742	27	684	Aluminium	simple	simple	4
2863	28	699	Manufactures of base metal, n.e.s.	simple	simple	4
3611	36	821	Furniture and parts thereof; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings	simple	simple	4
1822	18	843	Men's or boys' coats, capes, jackets, suits, blazers, trousers, shorts, shirts, underwear, nightwear and similar articles of textile fabrics, knitted or crocheted	simple	simple	4
1930	19	851	Footwear	simple	simple	4
3663	36	894	Baby carriages, toys, games and sporting goods	simple	simple	4

Source: Rycroft and Kash (1999). The Complexity Challenge, Pinter Publ., London, Appendix p.224 ff.

9. CONCLUSIONS: USING MONITORING OF STRUCTURAL CHANGE FOR POLICY ANALYSIS

We have developed a set of indicators to monitor structural change between and within sectors and the corresponding specialisation patterns with the object of assessing the competitiveness of EU Member States. We have defined competitiveness as the ability to raise standards of living and employment, while maintaining a sustainable environment and sustainable external balances.

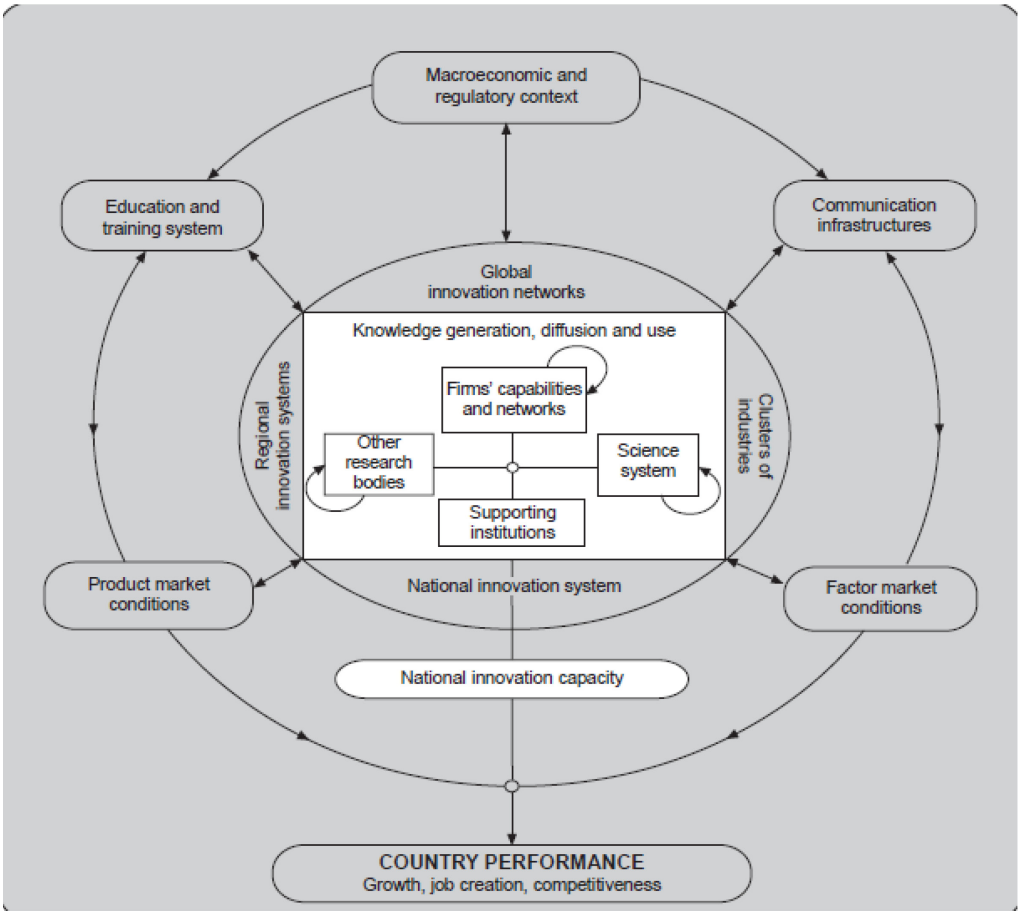
According to our survey of the literature, indicators of structural change, patterns of specialisation in both industry (i.e., value added data) and trade (i.e., export data) as well as of sectoral upgrading can all be used to shed light on firm capabilities, prospects for growth and on how to cope with adjustment pressure in the wake of rising competition. Our set of indicators basically confirms this, as it provides a clear-cut picture of competitive strengths and weaknesses of EU Member States not only using descriptive statistics but also an econometric framework. Hence, a first important conclusion from this report is that the analysis of structural change and economic specialisation can and does provide a significant insight into competitiveness and therefore that it is an effective indicator for monitoring competitiveness.

We tentatively interpret our set of indicators as reflecting firm capabilities which are at the core of current and future performance of economies. These firm capabilities are influenced by a wide range of factors, such as framework conditions, education and training, R&D funding, the science system etc (**Figure 37**). As a consequence, we view our set of indicators as related to both the current and future competitiveness of countries, whereas e.g. more innovation-centred indicator sets such as the Innovation Union Scoreboard are more informative for future performance.

A second important conclusion is that competitiveness can be sustained in very different industries or sectors; there is not only one industrial structure that is conducive to growth and the creation of more and better jobs. Ultimately, it is the successful transformation of different production factors into innovative or high-quality outputs that determines the competitiveness of firms in developed countries. These successful transformation processes take time to be established and cannot be copied overnight. However, this report makes it clear that in less knowledge-intensive industries, the task of maintaining competitiveness is harder. In brief, specialisation in "traditional" structures requires either high product quality or high R&D intensity to sustain competitiveness. Even though some countries feature firm capabilities that lead to high product quality in labour-intensive industries, labour-intensive industries are clearly declining, both in terms of export market share and in terms of shares in national value added. At the same time, trade specialisation in manufacturing industries labelled as knowledge-intensive should not be taken as a guide for underlying firm capabilities without examining within indicators such as product quality or R&D intensity since these reveal in which part of the value chain (R&D to assembly) countries are specialising. The reverse holds true for indicators of valued added in services industries.

A third conclusion is that the impact of the crisis on structural change and patterns of specialisation seems to have been limited overall, judging by a limited set of indicators available until the end of 2010. Of course, this assessment will have to be confirmed as soon as any more recent data is available. Of course, for some countries intentional, policy-driven structural change will be a major pathway out of the difficult economic situation the economic crisis has brought upon them.

Figure 37: Firm capabilities embedded in global, national and regional innovation systems



Source: OECD 1999.

Fourth, business cycles have a strong short-run impact on technology intense industries and an even stronger impact on industries characterised by a low educational intensity. They also have a long-run persistent effect on performance, which is however smaller. This effect is more accentuated in sectors with higher technology intensity than in other sectors. Our findings therefore support arguments in favour of supporting these industries during sharp economic downturns.

Finally, building country groups sharing similar characteristics of between and within indicators considerably helps us to structure and interpret the information gathered. Due to the high level of country heterogeneity within the EU, interpreting simple comparisons between individual countries and the EU average would be challenging and not necessarily particularly clarifying. The country groups' performance is consistent across indicators and in line with theoretical and empirical investigations of drivers of country competitiveness. One result of the analysis building on country groups is a clear picture of catching-up trends for groups 3 and 4, while group 2 is on average falling further behind group 1.

- What do the indicators tell us in detail about competitiveness? A critical appraisal

Among indicators reflecting structural change between industries and sectors, and the specialisation patterns this structural change leads to, we have examined the following: relative value added by industry and/or sector type, revealed comparative advantage by industry and/or sector type, share of exports to BRIC by industry type, share of business fluctuation, net entry of firms and high growth firms relative to the EU.

They are informative about the level of firm capabilities in a broad sense, not just in a purely technological sense, as requirements for firm-level competitiveness differ by industry or sector, hence specialisation patterns provide evidence for the set of firm level capabilities available. They are also informative about growth prospects, as structural change towards industries which feature higher productivity growth or which are sources of knowledge spillovers for the rest of the economy may enhance economy-wide growth prospects. Structural change towards industries which feature high export shares to fast-growing emerging countries may boost demand.

As regards data used, trade vs. value added data feature advantages and disadvantages. Trade data (in particular for manufacturing) are available internationally with short time lags at a very disaggregated level. However, trade manufacturing data do not allow for ascertaining the position in the value chain at which countries find themselves in. Value added data are closer to a country's "true" specialisation pattern in this regard. Hence, trade manufacturing specialisation data have to be backed up by within indicators, or value added between-indicators. The picture turns around for services, where trade indicators are more closely associated with competitiveness as exported services which meet the test of international markets are much less distorted by fragmented value chains. At the same time, value added in services may reflect sectors with purely domestic activity.

Concerning the level of disaggregation, 3-digit industries are closer to true markets than 2-digit sectors; however, internationally comparable services sector data is only available at the 2-digit level. Hence, 3-digit manufacturing data provides rich detail, but given manufacturing's small and declining share in GDP, 2-digit data – manufacturing and services – are necessary to provide a representative picture of structural change.

The factor-input industry classification discriminates well between countries and country groups when contrasting specialisation in technology-driven with specialisation in labour-intensive industries; a combination of the low-skill industry type with the labour-intensive industries features particular explanatory power. The high RQE – low RQE contrast is similar to the technology-driven-labour-intensive contrast, but achieves less clear differentiation between countries. The other factor-input industry types can also add interesting detail to country specialisation patterns, in particular as regards capital intensive and mainstream manufacturing industries. Capital-intensive and marketing-driven industry types show different country patterns when using value added or trade data – using trade data, higher income countries can show positive specialisation in them, while they have strong negative specialisation using value-added data.

The 2-digit classifications according to educational and innovative intensity complement each other well. The high EDU sectors feature a high share of services sectors, so that countries strong in services (and weak in manufacturing) are not just assessed on the basis of data putting manufacturing at the core of the analysis (e.g., the high-tech vs. low-tech classifications according to aggregate R&D intensity). Country specialisation patterns in high INNO sectors are similar to the ones in technology-driven industries; the classification is very useful for interpreting structural change in trade, including manufacturing and services. Overall, the rich mix of classifications and indicators provides for a balanced assessment of countries, reflecting competitive strengths and weaknesses against a broad background of services and manufacturing, trade and value added data.

We also tested another taxonomy which uses a broader, qualitative characterisation criterion in the form of the complexity of products and production processes. It is similar to our other taxonomies, corroborating our taxonomies which are based on quantitative, but narrower criteria.

Export shares to BRICs are an easy tool for assessing future export growth prospects. In general, export intensity of technology-driven and mainstream manufacturing sectors to the BRICs is much higher than the one of labour-intensive or marketing-driven industries. However, the indicators turn out to be insignificant in empirical analysis, so that we must treat them with caution. The firm demography indicators are potentially interesting, but a longer time series needs to be available. This will hopefully be the case due to the focus of EU 2020 on this area.

The between component of the R&D decomposition indicator – the sector effect - is similar to specialisation patterns as measured by technology-driven or high-INNO sectors. This indicator is most useful when examined in combination with the within effect, the country-specific R&D effect, to explain patterns of change in aggregate business R&D intensity.

Among indicators reflecting structural change within industries and sectors, and the specialisation patterns this structural change leads to, we have examined the following: the share in high and low price segments of industries by industry type, and sectoral R&D decomposition (the country effect). The price segment-indicator and the R&D country effect enable finer differentiation of the outcome of the analysis of the between indicators. E.g, the R&D country effect indicator shows that some countries featuring trade specialisation in technology-intensive industries must be specialised in the less innovation-intensive part of the corresponding value chain; and it can show, vice versa, that some countries featuring specialisation in less knowledge-intensive industries must be specialised in the very innovation-intensive part of the corresponding value chains. However, the R&D country effect is not always directly related to competitiveness, as catching-up countries with fast growing shares of technology-driven industries may show a declining R&D country effect, due to the R&D intensity lagging behind economic specialisation. The level of the R&D country effect should as a consequence in principle be very informative for countries with higher GPD per capita.

Quality analysis in trade has been a focus of recent academic literature. It has shown that increasing product quality is a main adjustment channel for firms of developed countries to cope with rising competitive pressure from emerging countries. Our analysis reveals that even in labour-intensive, low-skill industries quality upgrading can play an important role, and can be used to explain e.g. Italy's relatively good export performance relative to its specialisation patterns. It is also in line with evolutionary theories of firm and industrial evolution, which state that the building up of firm capabilities is a process which takes time and which cannot be copied that easily or that quickly. The quality component on its own should be complemented with between indicators to add information on longer term growth prospects, as countries featuring high quality performance may do so in shrinking sectors or sectors which have little impact on the wider economy.

Our labour productivity indicators suffer from severe data problems. Until better data become available their use to monitor competitiveness is limited; the same holds true for the sectoral decomposition of energy intensity.

Finally, the specific sectors and industries selected in each country according to their relative value added and their RCA bring the indicators to life. They hold the key to valuable information about a country's competitive strengths and weaknesses, its dynamic specialisation patterns and its ability to defend its strongholds.

The indicators we found to be most useful or interesting for manufacturing only, at the detailed 3-digit NACE-classification level, as substantiated by our literature survey, descriptive statistics, econometric analysis or policy usefulness, are the following:

- Relative Value Added (RVA) of technology driven and of labour-intensive&low-skill industries
- Share of exports in high price and low price segments of technology-driven and labour-intensive industries
- Share of exports to BRIC countries by industry type (technology-driven)

The indicators we found to be most useful or interesting for manufacturing and services combined, at the broad 2-digit NACE-classification level, are the following:

- Revealed Comparative Advantage (RCA) of sectors characterised by either high or low innovation and education intensity
- R&D decomposition indicators
- Firm demography indicators such as the share of high growth firms or net entry of firms in highly innovative sectors

- How can we use the indicators for policy analysis?

First, a word of caution: while the analysis of structural change can be very effective in assessing the competitiveness of countries, it should not be used directly for policy recommendations. It is a very good starting point, but more analysis is necessary to identify the policy levers available to contribute to structural change or to economic growth which will be reflected in changing specialisation patterns. Moreover, sectoral policy interventions will usually not be the main outcome of such an analysis, as structural change or economic growth can rarely be administered like a funding programme; rather it needs a broad mix of policies, including reforms of framework conditions such as product market regulation, innovation finance, education and training etc.

However, one way of using the indicators available as a starting point for more direct policy analysis would be to position countries along a continuum reflecting their performance according to the level and the change of the broad set of indicators, differentiating more finely than we have done with the four country groups above. E.g., countries could be put into categories characterised by

- Knowledge-intensive structures, high within-indicator levels, positive change
- Knowledge-intensive structures, high within-indicator levels, negative change
- Knowledge-intensive structures, low within-indicator levels, positive change
- Knowledge-intensive structures, low within-indicator levels, negative change
- Less knowledge-intensive structures, high within-indicator levels, positive change
- Less knowledge-intensive structures, high within-indicator levels, negative change
- Less knowledge-intensive structures, low within-indicator levels, positive change
- Less knowledge-intensive structures, low within-indicator levels, negative change

Countries that would become the focus of such an analysis could in a next step profit from policy learning from well performing countries in order to implement a smart specialisation strategy. However, this needs to take into account the institutional and spatial specificities of the countries. Alternatively, the country profiles (see country annex) can be taken as a starting point, comparing level and changes with their groups and with the EU average and hence allowing for identification of policy analysis priorities.

Some individual indicators can be used to shape policy: e.g., from the R&D decomposition the focus of research policy becomes apparent – is low R&D intensity a problem of structure or of intensity? This leads to very different sets of policies, one focusing on supporting the rise in R&D intensity, the other one addressing structural change more broadly. The shares of exports to BRIC may be used by export promotion agencies to provide information to SMEs etc.

To conclude, this report reflects a first step in establishing an indicator set relating structural change and economic specialisation to competitiveness. Of course, in the years to come, new data and new methods may become available which can potentially refine the present indicators or add new ones at the cost of old ones. The use of the report may also underline changing priorities for information need, so that the indicator set would be adjusted, just as the Innovation Union Scoreboard which has undergone numerous changes in method and indicators. However, given our various tests of the data, we are confident that the report presents a rich amount of data which can be of great relevance in the analysis of developments in economic performance of EU Member States.

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11. TECHNICAL APPENDIX

11.1. Detail of industrial classifications

11.1.1. Manufacturing 3-digit classifications

Factor-input classification

The classification groups individual industries according to their typical combinations of factor inputs, in order to reveal information about differences across industries with regard to the dominant modes of creating competitive advantage in specific marketplaces. In particular, the typology is directed towards distinction between (i) exogenously given competitive advantages based on factor endowments and (ii) endogenously created advantages based on strategic investment in intangible assets such as marketing and innovation. The new classification is based on EUROSTAT's revised NACE classification at the 3-digit level. For more details see Peneder (2002).

Data and the choice of variables

The clustering process is based on the following four variables, which are designed to span four orthogonal dimensions of how to spend available units of productive inputs:

- wages and salaries
- physical capital
- advertising
- research and development

Ratios to total value added have been calculated for wages and physical capital. Expenditures on advertising and R&D are represented by their ratios to total sales. The latter are derived directly from balance sheet data. All four variables have been used in their standardised form, i.e. transformed by calculating the difference to the mean divided by the standard deviation of the variables. Data sources are DEBA (labour and capital inputs) and COMPUSTAT (advertising and R&D). Since all four dimensions of input data were available only for the USA, the clustering process is exclusively based on US-data. Correlations between the four variables are low or non-existent.

Statistical clustering

Cluster analysis classifies individual observations, depending on their relative similarity or nearness to an array of different variables. The basic idea is one of dividing a specific data profile into segments by creating maximum homogeneity within and maximum distance between groups. For the current analysis one hundred NACE 3-digit manufacturing industries are taken as observations, while the four factor inputs given above determined the discriminating variables.

A two step procedure was applied. In the first step, a non-hierarchical optimisation cluster technique, based on the iterative minimisation of within group dispersion, was used to provide a more aggregate picture of typical input combinations. For the necessary choice of a predetermined number of clusters, the following self-binding rule of thumb was used: "Choose the lowest number g that maximises the quantity of individual clusters which include more than 5% of the observed cases." (Peneder, 1995, p. 297). The outcome was g = 32 clusters, of which 9 comprise more than 5% of total observations.

In a second step, the 32 clusters from the first partition were taken as individual observations on which a hierarchical clustering algorithm was applied. This implies that no predefined

number of clusters is required. Relative distances are measured, specifically focusing on similarities in patterns instead of size. In the following iterative process, clusters are formed according to the average linkage between groups, which aggregates the distances of all single pairs between an observation outside and each observation inside the cluster.

The final solution of the hierarchical clustering algorithm groups all observations into four categories, each one related to particularly high values in one of the four dimensions. After applying several variations on both (i) the measures for distance/similarity and (ii) the clustering algorithm itself no successful alternative partition to this solution emerged. Finally, a number of industries which had no particularly pronounced reliance on any of the input variables were placed in a residual category called 'mainstream' manufacturing. This more or less represents the input combination of a 'typical' 3-digit manufacturing industry.

The typology

Finally, precisely 100 NACE 3-digit manufacturing industries have been completely categorised under the following five mutually exclusive groupings of mainstream manufacturing, particularly labour-, capital-, advertising- and research intensive industries. Like any broad classification, this typology must be interpreted with care, since industries within these five categories are still heterogeneous and exhibit combinations of some or all these variables. A full list of industries is in Table 34

Classifying industries according to Revealed Quality Elasticity (RQE)

We use the following method to gain information about the relative role of quality and prices respectively. Industries in which higher prices (more exactly: higher unit values in exports relative to imports) are associated with lower quantities (more exactly: lower exported quantities relative to imported quantities) are revealed to be price elastic. Industries in which the signs of (net) prices and (net) quantities are the same are revealed to be quality elastic. The signs are calculated for the bilateral trade of the EU countries vis-à-vis thirty countries (including the EU partners, the USA, Japan, 8 emerging countries and 6 accession countries) in 1998. The share of identical signs indicates the importance of quality. The indicator can theoretically lie between 100 (all bilateral relations of prices and quantities have an identical sign) and 0 (all have opposite signs), empirically the indicator ranges from 53.5% to 25.0%.

The indicator is rather smooth in the sense that there seems to be no critical value separating different modes. We therefore group exactly one third of the industries into a category which we call industries with "high Revealed Quality Elasticity" (for short: high RQE), one third in a middle category (medium RQE or moderately price elastic industries) and the last 31 industries into a price elastic group (called low RQE). The cut-off points are 42.3% for the difference between high and medium and 34.5% for the border between medium and low. The cut-off points are determined according to the symmetry in the number of industries in each category and have no intrinsic interpretation. Subtracting the share of price elastic industries from that of quality elastic industries yields a balance indicator (net RQE = high RQE – low RQE). The indicator is derived from export data, but used to characterize the competitive mode typical for all sales.

A full list of industries is in Table 34. The classification of trade data can be done along the lines of the value added classification, there are only minor differences – overall, 6 value added industries are missing in the trade classification, while 2 industries are present in the trade but not in the value added classification.

Table 34: Industries used for 3-digit manufacturing industries

Nace		Factor inputs	Labour skills	*RQE*
151	Meat products	4	1	2
152	Fish and fish products	4	1	2
153	Fruits and vegetables	4	1	3
154	Vegetable and animal oils and fats	4	1	3
155	Dairy products; ice cream	4	1	1
156	Grain mill products and starches	4	1	2
157	Prepared animal feeds	4	1	2
158	Other food products	4	1	2
159	Beverages	4	1	1
160	Tobacco products	4	1	1
171	Textile fibres	3	1	2
172	Textile weaving	2	1	1
173	Finishing of textiles 1)	1	1	
174	Made-up textile articles	2	1	3
175	Other textiles	1	1	2
176	Knitted and crocheted fabrics	1	1	1
177	Knitted and crocheted articles	1	1	2
181	Leather clothes	2	1	2
182	Other wearing apparel and accessories	2	1	1
183	Dressing and dyeing of fur; articles of fur	2	1	2
191	Tanning and dressing of leather	4	1	1
192	Luggage, handbags, saddlery and harness	4	1	1
193	Footwear	4	1	1
201	Sawmilling, planing and impregnation of wood	2	2	3
202	Panels and boards of wood	2	2	3
203	Builders' carpentry and joinery	2	2	2
204	Wooden containers	2	2	3
205	Other products of wood; articles of cork, etc.	2	2	3
211	Pulp, paper and paperboard	3	3	3
212	Articles of paper and paperboard	1	3	3
221	Publishing	4	3	3
222	Printing	4	3	2
223	Reproduction of recorded media 1)	4	3	
231	*Coke oven products 2)*	3	3	2
232	*Refined petroleum and nuclear fuel 2)*	3	3	2
233	*Nuclear fuel 2)*	3	3	2
241	Basic chemicals	3	3	3
242	Pesticides, other agro-chemical products	5	3	1
243	Paints, coatings, printing ink	1	3	1
244	Pharmaceuticals	5	4	1
245	Detergents, cleaning and polishing, perfumes	4	3	2
246	Other chemical products	5	3	1
247	Man-made fibres	3	3	2
251	Rubber products	1	1	3
252	Plastic products	1	1	2
261	Glass and glass products	1	1	3
262	Ceramic goods	2	1	2
263	Ceramic tiles and flags	3	1	2
264	Bricks, tiles and construction products	2	1	3
265	Cement, lime and plaster	3	1	3
266	Articles of concret, plaster and cement	1	1	3
267	Cutting, shaping, finishing of stone	2	1	3
268	Other non-metallic mineral products	1	1	3
271	Basic iron and steel, ferro-alloys (ECSC)	3	1	3
272	Tubes	1	1	3
273	Other first processing of iron and steel	3	1	2
274	Basic precious and non-ferrous metals	3	1	3
275	Casting of metals 1)	2	1	

Nace		Factor inputs	Labour skills	*RQE*
281	Structural metal products	2	2	2
282	Tanks, reservoirs, central heating radiators and boilers	4	2	1
283	Steam generators	2	2	3
284	Forging, pressing, stamping and roll forming of metal 1)	2	2	
285	Treatment and coating of metals 1)	2	2	
286	Cutlery, tools and general hardware	4	2	2
287	Other fabricated metal products	1	2	3
291	Machinery for production, use of mech. power	1	4	2
292	Other general purpose machinery	1	4	1
293	Agricultural and forestry machinery	1	4	1
294	Machine-tools	2	4	1
295	Other special purpose machinery	1	4	1
296	Weapons and ammunition	1	4	3
297	Domestic appliances n. e. c.	1	3	3
300	Office machinery and computers	5	4	2
311	Electric motors, generators and transformers	1	3	3
312	Electricity distribution and control apparatus	5	3	1
313	Isolated wire and cable	1	3	3
314	Accumulators, primary cells and primary batteries	1	3	3
315	Lighting equipment and electric lamps	1	3	2
316	Electrical equipment n. e. c.	2	3	2
321	Electronic valves and tubes, other electronic comp.	5	3	2
322	TV, and radio transmitters, apparatus for line telephony	5	3	1
323	TV, radio and recording apparatus	5	3	3
331	Medical equipment	5	3	1
332	Instruments for measuring, checking, testing, navigating	5	3	1
333	Industrial process control equipment 1)	5	3	
334	Optical instruments and photographic equipment	5	3	1
335	Watches and clocks	4	3	1
341	Motor vehicles	5	2	1
342	Bodies for motor vehicles, trailers	2	2	1
343	Parts and accessories for motor vehicles	3	2	1
351	Ships and boats	2	2	2
352	Railway locomotives and rolling stock	2	2	1
353	Aircraft and spacecraft	5	4	1
354	Motorcycles and bicycles	1	2	3
355	Other transport equipment n. e. c.	1	2	2
361	Furniture	2	2	2
362	Jewellery and related articles	2	2	1
363	Musical instruments	4	2	2
364	Sports goods	4	2	2
365	Games and toys	4	2	1
366	Miscellaneous manufacturing n. e. c.	4	2	3

1..Mainstream	1..Low skill industries	1..H = high RQE/product differentiation
2..Labour intensive industries	2..Medium skill/blue collar workers	2..M = medium RQE/product differentiation
3..Capital intensive industries	3..Medium skill/white collar workers	3.. L = low RQE/product differentiation
4..Marketing driven industries	4..High skill industries	
5..Technology driven industries		

1) Only value added. 2) Value added: only Nace 23 (2-digit) available.

11.1.2. Manufacturing and services 2-digit classifications

Innovation intensity

We characterise each sector type as follows:

High innovation intensity: Sectors are characterised by a high share of creative entrepreneurship focused on product innovation (either alone or in combination with process innovations) and many firms performing high intramural R & D. Typically, the appropriability regime depends on the use of patents (frequently applied together with other measures), and knowledge is highly cumulative. This group is mainly comprised of ICT-related sectors such as computers and office machinery, electrical equipment, communication technology, precision instruments, and computer related services. Other sectors within this group are machinery and R & D services.

Medium high innovation intensity: This group is comprised of sectors with an intermediate share of creative entrepreneurship mostly involved in process innovations, and many firms performing R & D, albeit amounting to less than 5 % of turnover. Cumulativeness of knowledge is high or intermediate and patents are frequently used for appropriation. Examples are chemicals, motor vehicles, other transport equipment, or telecommunication and postal services. The latter is distinctly characterised by high creative entrepreneurship with product innovations in combination with much external acquisition of new technology.

Medium innovation intensity: This group is the most heterogeneous, although common to all sectors is the large number of firms pursuing opportunities through the acquisition of external innovations. Accordingly, appropriability measures are relatively weak, with a certain degree of importance accrued by strategic means. In this group, we find wood and wood products, pulp and paper, metal products, as well as air transport, financial intermediation and other business services.

Medium low innovation intensity: The main characteristic of this group is the high share of adaptive entrepreneurship, pursuing opportunities through the adoption of new technology. Accordingly, the prevalent mode of innovation activity is the acquisition of new technology. Appropriability conditions are generally weak and the cumulativeness of knowledge is low. Examples are the food sector, publishing and reproduction, electricity and gas, and insurance and pension funding.

Low innovation intensity: Finally, this group is characterised by a predominance of entrepreneurs pursuing opportunities other than from new technology, typically performing neither innovation activities nor applying any measures for appropriation. The cumulativeness of knowledge is low. Examples are clothing, leather products, wholesale trade, land and water transport

For further details of the construction of the classification of value added sectors, see Peneder (2010). For manufacturing and services exports, the manufacturing data come from the goods database Comext where there is a key to link trade with value added classifications. The services data come from the Eurostat balance of payments database BOP. We developed our own correspondence key with NACE value added classifications (see Table 36). A full list of sectors is in Table 35.

Table 35: Sectors used for 2-digit manufacturing and services taxonomies

		INNO				EDU			
		Peneder 2010	EUKLEMS	OECD STAN	SBS	Peneder 2007	EUKLEMS	OECD STAN	Eurostat SBS
		5-scale				7-scale		5-scale	
AtB	AGRICULTURE, HUNTING, FORESTRY AND FISHING					7	5		
C	MINING AND QUARRYING		5			4	3	3	
10	Mining of coal and lignite; extraction of peat	4		4					
11	Extraction of crude petroleum and natural gas and services	4		4					
13t14	MINING AND QUARRYING EXCEPT ENERGY PRODUCING MATERIALS								
14	Other mining and quarrying	5		5					
15t16	FOOD , BEVERAGES AND TOBACCO		4			6	5		5
15	Food and beverages	4		4	4			5	
16	Tobacco	4		4	4			5	
17t19	TEXTILES, TEXTILE , LEATHER AND FOOTWEAR		4			7	5		
17	Textiles	2		2	2	7		5	5
18	Wearing Apparel, Dressing And Dying Of Fur	5		5	5	7		5	5
19	Leather, leather and footwear	5		5	5	7		5	5
20	WOOD AND PRODUCTS OF WOOD AND CORK	3	3	3	3	7	5	5	5
21t22	PULP, PAPER, PAPER , PRINTING AND PUBLISHING		3			4	3		
21	Pulp, paper and paper	3		3	3	4		3	3
22	Printing, publishing and reproduction	4		4	4	4		3	3
23	Coke, refined petroleum and nuclear fuel	2	2	2	2	3	2	2	2
24	Chemicals and chemical	2	2	2	2	3	2	2	2
25	Rubber and plastics	2	2	2	2	5	4	4	4
26	OTHER NON-METALLIC MINERAL	2	2	2	2	6	5	5	5
27t28	BASIC METALS AND FABRICATED METAL		3			6	5		
27	Basic metals	2		2	2	6		5	5
28	Fabricated metal	3		3	3	6		5	5
29	MACHINERY, NEC	1	1	1	1	4	3	3	3
30t33	ELECTRICAL AND OPTICAL EQUIPMENT		1				2		
30	Office, accounting and computing machinery	1		1	1	2		1	1
31	Electrical machinery and apparatus, nec	1		1	1	4		3	3
32	Radio, television and communication equipment	1		1	1	3		2	2
33	Medical, precision and optical instruments	1		1	1	3		2	2
34t35	TRANSPORT EQUIPMENT		2				3		
34	Motor vehicles, trailers and semi-trailers	2		2	2	4		3	3
35	Other transport equipment	2		2	2	3		2	2
36t37	MANUFACTURING NEC; RECYCLING		3			5	4		4
36	Manufacturing nec	3		3	3			4	
37	Recycling	5		5	5			4	
E	ELECTRICITY, GAS AND WATER SUPPLY		4			4	3		
40	ELECTRICITY AND GAS	4		4	4	4		3	3
41	WATER SUPPLY	4		4	4	4		3	3
F	CONSTRUCTION					6	5	5	5
G	WHOLESALE AND RETAIL TRADE								
50	Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of fuel					6	5	5	5
51	Wholesale trade and commission trade, except of motor vehicles and mc	5	5	5	5	4	3	3	3
52	Retail trade, except of motor vehicles and motorcycles; repair of household goods					5	4	4	4
H	HOTELS AND RESTAURANTS					7	5	5	5
60t63	TRANSPORT AND STORAGE		5				4		
60	Other Inland transport	5		5	5	5		4	4
61	Other Water transport	5		5	5	5		4	4
62	Other Air transport	3		3	3	3		2	2
63	Other Supporting and auxiliary transport activities; activities of travel agen	5		5	5	4		3	3
64	POST AND TELECOMMUNICATIONS	2	2	2	2	4	3	3	3
641	Post and courier avtivities					4			
642	Telecommunications					3			
J	FINANCIAL INTERMEDIATION		3				2		
65	Financial intermediation, except insurance and pension funding	3		3		2		1	
66	Insurance and pension funding, except compulsory social security	4		4		3		2	
67	Activities related to financial intermediation	5		5		3		2	
K	REAL ESTATE, RENTING AND BUSINESS ACTIVITIES								
70	Real estate activities					4	3	3	3
71t74	Renting of m&eq and other business activities		2			2	1		
71	Renting of machinery and equipment					4		3	3
72	Computer and related activities	1		1	1	1		1	1
73	Research and development	1		1	1	1		1	1
74	Other business activities	3		3	3	2		1	1
L	PUBLIC ADMIN AND DEFENCE; COMPULSORY SOCIAL SECURITY					3	2	2	
M	EDUCATION					1	1	1	
N	HEALTH AND SOCIAL WORK					3	2	2	
O	OTHER COMMUNITY, SOCIAL AND PERSONAL SERVICES					3	2	2	
P	PRIVATE HOUSEHOLDS WITH EMPLOYED PERSONS					7			
Q	EXTRA-TERRITORIAL ORGANIZATIONS AND BODIES					1			

5-scale: 1.. High - 2.. Med-high - 3.. Med - 4.. Med-low - 5.. Low.

7-scale: 1.. Very high - 2.. High - 3.. Med-high - 4.. Intermediate - 5.. Med-low - 6.. Low - 7.. Very low.

Table 36: List of service sectors and their respective identification within the two taxonomies innovation and education intensity for trade in services data

Taxonomy	EBOP	Sector name	Classification
Innovation	262	Computer and information services	High
	266	Royalties and license fees	High
	279	Research and development	High
	245	Communication services	Med-high
	260	Financial services	Med
	210+2181	Air transport (including space transport)	Med
	273-279	Other business services (273-279)	Med
	253	Insurance services	Med-low
	206	Sea transport, freight	Low
	214-2181	Other transport (without space transport)	Low
Education	262	Computer and information services	High
	266	Royalties and license fees	High
	279	Research and development	High
	260	Financial services	High
	273-279	Other business services	High
	210+2181	Air transport (including space transport)	Med-high
	253	Insurance services	Med-high
	287	Personal, cultural and recreational services	Med-high
	291	Government services, n.i.e.	Med-high
	245	Communication services	Med
	272	Operational leasing services	Med
	206	Sea transport, freight	Med-low
	214-2181	Other transport (without space transport)	Med-low
	249	Construction services	Low
	236	Travel	Low

Education intensity

This description is taken from Kegels et al., (2008, p. 20).

"The literature reveals at least three causal links, by which schooling relates to future earnings: first, through the acquisition of cognitive and social skills (human capital theory); second, by sorting high- and low-productivity personnel into appropriate jobs (signalling and screening); and third, by increasing a society's capacity for innovation and the diffusion of new ideas (knowledge spillovers). Taken together, the three mechanisms support the conclusion that educational attainment is a valid measure of the productive capabilities available in the human resource base of a firm, sector or country.

The theoretical literature also provides various explanations for the sector specificity of educational intensity. Assuming that factor and product markets are perfectly competitive, the most straightforward explanation of variations in the demand for educated personnel are intrinsic differences in the technology of production, which determines the marginal product, and together with input prices the factor shares of distinct skill classes. For a given level of output, the respective ratio of wages to labour productivity is therefore the immediate criterion in selecting skill standards for heterogeneous types of labour. From the perspective of a human resource manager, the required skill standards therefore depend on the characteristics of the technology and labour markets, which correlate with sector-specific contexts.

[We classify] forty-nine manufacturing and service industries according to their educational workforce composition. Peneder (2007) documents this classification. It emanates from

statistical cluster techniques applied to data for the US, Germany, France, the UK and Austria. For that purpose, an industry's workforce was segregated by the individual's highest level of educational attainment, for which the shares in total employment, wages or hours worked were calculated. To summarise briefly, the taxonomy separates the three following mutually exclusive classes of industries...

- ... with low educational intensity: agriculture, food, textiles and clothing, wood and products of wood, mineral products, basic metals and metal products, construction, sale & repair of motor vehicles, or hotels and catering.
- ... intermediate educational intensity: mining, pulp and paper (products), printing and publishing, oil-refining, chemicals, rubber and plastics, mechanical engineering and apparatus, motor vehicles and other transport vehicles, miscellaneous manufacturing, electricity, gas and water supply, retail and wholesale trade, transport, communications, real estate, renting of machinery, public administration and other services.
- ... high educational intensity: financial intermediation, computer and related activities, research and development, other business services, and education.

A full list of sectors is in Table 35.

11.2. Calculation of indicators

11.2.1. Technical Appendix for Domestic Economy Indicators

Value added shares (VA)

This indicator measures the share of value added of an industry or a sector in total value added of a country.

$$VA_{i,j}(t) = (VA_{i,j}(t) / \sum_{i=1}^{k} VA_{i,j}(t))$$

Generally the following labelling and subscripts are used: j … reporting country, j=1,...,n, N = number of countries; i … industry/sector, i=1,…,k, K = number of industries/sectors; t … year.

Databases and Data Manipulation

For this indicator, two databases are used, OECD STAN and EU KLEMS. OECD STAN has no EU aggregate. We build an aggregate of value added by converting sectoral nominal value added of the countries into power purchasing parity-based value added with aggregate OECD PPPs for each year of the series, then summing up over the 21 EU countries available. We use PPPs rather than market exchange rates to avoid wide swings associated with market exchange rates; especially for non-Euro area members (see Gulde and Schulze-Ghattas, 1993, for a detailed examination of the benefits using PPP-adjusted measures for aggregating variables in the framework of the IMF World Economic Outlook).

Using aggregate expenditure-based PPPs to convert sectoral value added is imprecise, as papers critical of Bernard and Jones' (1996) approach point out (see Timmer et al., 2010, and Van Biesebroeck, 2009): as relative prices between sectors across countries may and do deviate from the relative prices at the aggregate level (i.e., the aggregate PPPs), using aggregate PPPs may mask differential sectoral developments. Van Biesebroeck (2009) maps prices from household surveys into the industrial classification of sectors and adjusts for taxes and international trade to obtain a sector-specific, expenditure-based PPP. He tests their validity and finds that for agriculture, mining and some less sophisticated manufacturing sectors the sector-specific PPPs perform better than the aggregate PPPs in terms of capturing

differential changes in relative prices between countries, while for most other sectors the aggregate PPPs perform better.
Timmer et al. (2010) argue that a mixture of sectoral PPPs derived from the expenditure and industry-of-origin approach should be used to compare value added at sectoral level. The industry-of-origin approach basically means that PPPs are calculated from the producers' point of view (and not the consumers', as in expenditure PPPs). They implement this approach in the EU KLEMS productivity level database; the EU 25 aggregate in the KLEMS database is built using sectoral gross output PPPs. However, this approach also relies on a number of assumptions and is not easily reproducible on a regular basis.
We have experimented with the different approaches – using the KLEMS sectoral PPPs and using aggregate PPPs – and have opted for the latter approach as used by Bernard and Jones (1996), not only because it is easier to implement but also because using KLEMS PPPs produces implausible values for some countries in some years (see below the data for productivity).

As regards missing values in the databases at sectoral level, the main issue is that in some countries, not the full sectoral detail is available as in other countries and as necessary for applying our sectoral classifications. We filled these gaps by attributing the amount of the larger aggregate available to individual sectors according to the shares of the individual sectors in the same aggregate of the EU average.

Groups are weighted by value added shares.

Data for VA, summary

Country coverage	EU 25 (EU KLEMS; EU 27 excl. Romania and Bulgaria); USA, Japan, South Korea EU 21 (OECD STAN; EU 27 excl. Bulgaria, Cyprus, Malta, Latvia, Lithuania and Romania), Switzerland
Time coverage	1999-2007
Sector coverage	See annex on industrial classification, manufacturing and services sectors (NACE 2-digit level)

Relative valued added (RVA)

This indicator measures the share of value added of an industry or a sector in total value added of a country, relative to the share of the same industry or sector in total value added of the EU.

$$RVA_{i,j}(t) = (VA_{i,j}(t) / \sum_{i=1}^{k} VA_{i,j}(t)) / (\sum_{j=1}^{n} VA_{i,j}(t) / \sum_{i=1}^{k}\sum_{j=1}^{n} VA_{i,j}(t))$$

Generally the following labelling and subscripts are used: j … reporting country, j=1,...,n, N = number of countries; i … industry/sector, i=1,…,k, K = number of industries/sectors; t … year.

Values above 1 indicate "industry specialisation", i.e. a higher share of sector i in value added of country j than in the EU, values below 1 indicate a lower share. For the summary tables in the country annex, the logarithm is taken as for RCA to facilitate comparison between trade and industry specialisation.

Databases and data manipulation

The main database used for the RVA is Eurostat SBS, which includes all the EU Member States with the exception of Malta. To provide international comparison, we included the US using data from the Census Bureau (Annual Survey of Manufactures). We converted NAICS industries (the industrial classification system of the US) to NACE industries using a key provided by Mason et al. (2008). When mapping of NAICS industries to NACE industries was not possible at the detailed industry level, we split the larger aggregate into individual industries according to the shares of the individual industries in the same aggregate of the EU average. Groups are weighted by value added shares.

Data for RVA, summary

Country coverage	EU 26 (EU 27 excluding Malta) (Eurostat SBS); USA (Census Bureau, Annual Survey of Manufactures)
Time coverage	1999-2007; 2008 only for the USA
Sector coverage	See annex on industrial and sector classification, manufacturing and services sectors (NACE 2-digit level) as well as manufacturing industries (NACE 3-digit level).

Relative labour productivity (RLP)

To calculate relative labour productivity growth and levels, we first calculate sectoral labour productivity as value added per employee:

$$LP_{i,j}(t) = (VA_{i,j}(t) / E_{i,j}(t))$$

Then we calculate relative labour productivity in terms of levels in the following way:

$$RLP_{i,j} = (LP_{i,j} / LP_j) / (\overline{LP_i} / \overline{LP_n})$$

Where LP_j is the labour productivity level of a country, $\overline{LP_i}$ the labour productivity of sector i in the whole of the EU, and $\overline{LP_n}$ the labour productivity level of the EU.

To convert sectoral value added into real amounts comparable between countries, in case of the KLEMS data, we use the sectoral gross output PPPs from the KLEMS database which have been calculated for the year 1997, to convert the nominal sectoral value added of the year 1997. We then use growth rates of the real value added series to construct the other years.

In case of the OECD STAN data, we use the 2007 aggregate PPPs to convert the 2007 (base year) nominal series into real data and then use the growth rates of the real value added series to construct the other years. As there is no EU aggregate in the OECD STAN database, we sum the converted valued added data of the individual countries.

In terms of results, we have more confidence in the STAN data than in the KLEMS data, hence we use KLEMS data only for the countries which are not in the STAN database. Due to the high uncertainty involved in relative labour productivity levels both as a result of using employees rather than working hours and relying on imprecise ways to correct for sectorally diverging relative prices, we report results for countries in terms of quintile ranks only, i.e. countries can be in one of five quintiles, with 1 the top quintile and 5 the bottom quintile.

As labour productivity growth may be negative, we calculate relative labour productivity growth as a differential:

$$\Delta RLP_{i,j} = (\Delta LP_{i,j} - \Delta LP_j) - (\Delta \overline{LP_i} - \Delta \overline{LP_n})$$

Where Δ stands for average annual growth rate over the period 1999 – 2007. Deflated sectoral series are available both in KLEMS and in STAN, so that we escape the pitfalls of converting sectoral value added in internationally comparable amounts. However, we need to build an EU aggregate in the OECD data. For this, we proceed as above for the productivity levels, summing across countries real sectoral value added. Relative labour productivity growth suffers from taking employees rather than working hours; we report only broad categories with reference to the mean of the EU. Again, we have more confidence in the STAN data.

Data for RLP, summary

Country coverage	EU 25 (EU KLEMS; EU 27 excl. Romania and Bulgaria); USA, Japan, South Korea EU 21 (OECD STAN; EU 27 excl. Bulgaria, Cyprus, Malta, Latvia, Lithuania and Romania), Switzerland
Time coverage	1999-2007
Sector coverage	See annex on sector classification, manufacturing and services sectors (NACE 2-digit level)

Firm demography indicators

The firm demography indicators are basically taken from the Eurostat database Structural Business Statistics (SBS), with minor transformations by WIFO.

Business fluctuation as reported by Eurostat is the sum of firm entry and exit (or birth and death) rates by sector. We compare business fluctuation in a sector in a country with the same sector in the EU total and call it relative business fluctuation (RBF):

$$RBF_{i,j}(t) = (BF_{i,j}(t) / (\sum_{j=1}^{n} BF_{i,j}(t))$$

Generally the following labelling and subscripts are used: j … reporting country, j=1,...,n, N = number of countries; i … industry/sector, i=1,…,k, K = number of industries/sectors; t … year.

Net entry as reported by Eurostat is the annual growth of the active firm population, i.e. firm births and deaths have been taken into account in the annual growth statistics of Eurostat. We compare net entry in a sector in a country with the same sector in the EU total and call it relative net entry (RNE). As net entry may be negative, we cannot simply divide by the EU-sector, but instead calculate a differential, as above with relative labour productivity growth.

$$RNE_{i,j}(t) = (NE_{i,j}(t) - (\sum_{i=1}^{k} NE_{i,j}(t)) - (\sum_{j=1}^{n} NE_{i,j}(t) - \sum_{i=1}^{k} \sum_{j=1}^{n} NE_{i,j}(t))$$

Generally the following labelling and subscripts are used: j … reporting country, j=1,...,n, N = number of countries; i … industry/sector, i=1,…,k, K = number of industries/sectors; t … year.

The share of high growth firms in the population of active enterprises as reported by Eurostat includes all enterprises with average annualised growth greater than 20% per annum, over a three year period. Growth can be measured by the number of employees or by turnover; we report only firms with more than 10 employees. We report the share relative to the EU

$$HGF_{i,j}(t) = (HGF_{i,j}(t) / (\sum_{j=1}^{n} HGF_{i,j}(t))$$

Generally the following labelling and subscripts are used: j … reporting country, j=1,...,n, N = number of countries; i … industry/sector, i=1,…,k, K = number of industries/sectors; t … year.

To be able to form sector groups by taxonomy, we weigh sectoral shares in high growth firms by the population of active enterprise above 10 employees, provided by Eurostat in the same database SBS. The EU aggregate for the population of active enterprises corresponds to the sum of the countries where high growth data are available.

Data for firm demography indicators, summary

Country coverage	RBF: EU 22 (EU 27 excl. Greece, Ireland, Malta, Poland, Romania) RNE: EU 22 (EU 27 excl. Greece, Ireland, Malta, Poland, Romania) HGF: EU 16 (Bulgaria, Czech Republic, Denmark, Estonia, Finland, Hungary, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Portugal, Slovakia, Slovenia, Spain, Sweden) for employment, for turnover excl. Spain
Data source	Eurostat SBS
Time coverage	2006, 2007
Sector coverage	See annex on sector classification, manufacturing and services sectors (NACE 2-digit level)

11.2.2. Technical Appendix for foreign trade indicators

Revealed comparative advantage (RCA)

The revealed comparative advantage (RCA) indicator measures export specialisation by comparing a sector's share in total exports for a given country with that for the EU27 as a whole. The indicator can also be interpreted as a "normalised" export market share of the given country for a selected sector, as it compares the market share in total EU27 exports gained in a specific sector with the average export market share that the country reached in total exports, the sum over all sectors, see also the following formula.

$$RCA_{ij\,(mt)} = ln\left[\left(X_{ij\,(mt)} / \sum_{j=1}^{n} X_{ij\,(mt)}\right) \Big/ \left(\sum_{i=1}^{k} X_{ij\,(mt)} / \sum_{i=1}^{k}\sum_{j=1}^{n} X_{ij\,(mt)}\right)\right]$$

Generally the following labelling and subscripts are used: X … export; j … reporting country, j=1,...,n, N = number of countries; i … industry/sector, i=1,…,k, K = number of industries/sectors; m … partner country/region; t … year.

For the final indicator the logarithm of this relation is taken, therefore values above 1 signal that relative to the EU27 average, the country specialises in exports in the selected sector. The change in RCA is defined as the absolute difference of the value of the RCA indicator in time 0 and time t. The indicator is calculated for three partner regions, total exports, extra-EU27 exports as well as intra-EU exports. RCA figures are considered separately for exports in manufacturing goods and exports in services. The data source for the former is the Eurostat Comext database, results are presented on 2- and 3-digit NACE2003 level as well as for the factor input and revealed quality elasticity (RQE) taxonomy, the time period covers 1999 to 2010. The data source for the analysis of RCA indicators in service exports is the Balance of Payment (BOP) database from Eurostat. Trade in services data are much more limited referring to the disaggregation level as well as the time horizon. Results can therefore be

presented just for 11 service sectors, and for the time period 2004 to 2009. Additionally the RCA indicator is computed for two new taxonomies (innovation and education type) which combine trade in goods and trade in services. However, as this two new taxonomies, rely on detailed sector information for trade in services, availability is even more restricted, therefore the results are not available for all 27 EU member states and/or all years between 2004 and 2009.

Export shares in total manufacturing as percent

This indicator refers to the share of exports by one selected sector in relation to total country exports. The indicator is again calculated for total exports, extra-EU27 exports as well as intra-EU exports; for trade in manufacturing goods (both on 2- and 3 digit NACE2003 level as well as for the factor input and RQE taxonomy) and trade in 11 services sectors and additionally for the two new taxonomies (innovation and education type). The data source and time coverage is the same as above for the calculation of RCA indicators.

Share of exports to BRIC in total exports as percent

This indicator refers to the share of exports to the BRIC of one selected sector (on the 2-digit NACE2003 level as well as for the factor input and RQE taxonomy) in relation to total country exports (the sum over all sectors). The indicator is calculated for manufactured goods exports, data source and time coverage is the same as above for the calculation of RCA indicators.

Price segments

The aim of the analysis of price segments is to identify whether individual countries focus more on high, medium or low price segments within given industries and whether this relation has changed over time. Changes in the strategies to move into the highest price segments within industries are signalling an "intra-industry" upgrading. The price segments for manufacturing exports are defined at the 6-digit NACE2003 level for three selected time points (1999, 2007, 2009). Manufacturing exports data are taken from the Eurostat Comext database. All 27 individual EU member states are covered, for each member state all reported bilateral exports values and quantities are used. Whenever both information on export values as well as quantities were available and above a certain threshold (10,000€ for values and 2 tons for quantities) export unit values are calculated as the ratio of values to quantities and expressed in kg/€. Afterwards for each 6-digit NACE level the 33.3 and 66.7 percentile[21] of the distribution of all bilateral export unit values of all 27 individual EU member states are defined as cutting points for the three price segments (high, medium or low). The boundaries are identical for all countries at the 6-digit level, but different for the three selected time periods (1999, 2007, 2009). These boundaries are then used to classify each bilateral export value at the d 6-digit level into one of the three price segments, for example trade values with a unit values below the 33.3 percentile threshold form therefore the low price segment category. In the end, exports values are summed up to different aggregation levels (the two taxonomies factor input and revealed quality elasticity type as well as for total country exports) for each price segment category. The resulting aggregated export values for the low, medium and high price segment are than expressed as the respective share in total exports of the analysed country. For Malta and Luxemburg a smaller set of unit values was available, therefore the result for these countries should be interpreted with caution.

[21] These results give the value below which 33.3/66.7 percent of the export unit value observations are found.

World export market share

For the EU27 as a whole, the US, Japan as well as the individual BRIC countries (Brazil, Russia, India and China) additionally "world" export market shares were calculated according to the following formula.

$$Worldmarketshare_{ij} = \frac{X_{ij}}{\sum_{j=1}^{w} X_{ij}}$$

Generally the following labelling and subscripts are used: X … export values; j … reporting country, j=1,...,w, W = number of countries; i … industry/sector, i=1,…,k, K = number of industries/sectors.

The figures exclude intra-EU trade values. The indicator measures for each analysed sector/taxonomy the market share of exports of the examined country/country group relative to a proxy for total worldwide exports in this sector/taxonomy. The proxy for "world export" differs for trade in goods and services. For services exports the aggregate of the following regions and countries are taken as proxy for "world export", besides all individual EU27, EFTA, NAFTA and BRIC countries, Croatia, other OECD[22] as well as selected Asian[23]), and African[24]) and Central and South American[25]) countries. This definition comprises approximately 64.5 percent of total world exports in services in 2004 and 65.6 percent in 2009. Data source for export of services is Eurostat Balance of Payments statistics, the time period 2004 to 2009 and 11 service sectors are covered. The applied proxy for worldwide manufactured goods exports comprises approximately 90 percent of total world goods exports in 1999 and 80 percent in 2009. Data for goods exports are taken from the UNO Comtrade database, the years 1999 to 2009 are covered in the analysis, the indicator is calculated for trade in manufacturing goods on the 2 and 3-digit NACE2003 level as well as for the factor input and RQE taxonomy.

[22] OECD34 without Australia.
[23] Indonesia, Hong Kong, Kuwait, Malaysia, Singapore, Thailand.
[24] Egypt, Morocco, South Africa and Tunisia.
[25] Argentina, Colombia, Costa Rica, Panama and Peru.

11.2.3. Technical Appendix for the R&D decomposition

Comparison of structural and country effects of R&D intensities across countries

Direct comparisons of R&D expenditures relative to GDP are flawed as especially the business R&D expenditures (BERD) are heavily influenced by the industrial structure of each country. Smith and Sandven (1998) have therefore proposed a decomposition that identifies country and sector effects in BERD and therefore permits to compare R&D intensities in the business sector across countries. The starting point for their decomposition is the observation that

$$I_{M,j} = \frac{RD_{M,j}}{VA_{M,j}} = \frac{RD_{1,j}}{VA_{M,j}} + \cdots + \frac{RD_{n,j}}{VA_{M,j}} = \left(\frac{RD_{1,j}}{VA_{1,j}}\frac{VA_{1,j}}{VA_{M,j}}\right) + \cdots + \left(\frac{RD_{n,j}}{VA_{n,j}}\frac{VA_{n,j}}{VA_{M,j}}\right) \rightarrow$$

$$I_{M,j} = \sum_{i=1}^{n} I_{i,j} w_{i,j}, \cdots (1)$$

where $RD_{M,j}$ and $VA_{M,j}$ are the aggregate R&D expenditures of the business sector M in country j, and the index $i = 1,..,n$ indexes the single industries i. Variables $I_{i,j}$ and $w_{i,j}$ are then the industry specific R&D intensities and the weight of the sector in aggregate business sector output $VA_{M,j}$.

Simple expansions of the above expression yield

$$I_{M,j,t} = \sum_{i=1}^{n} \bar{I}_{i,t} w_{i,j,t} + \sum_{i=1}^{n} (I_{i,j} - \bar{I}_i) w_{i,j,t}, \cdots (2)$$

and

$$I_{M,j,t} = \sum_{i=1}^{n} \bar{I}_i w_{i,j,t} + \sum_{i=1}^{n} (I_{i,j,t} - \bar{I}_{i,t}) \bar{w}_{i,t} + \sum_{i=1}^{n} (I_{i,j,t} - \bar{I}_{i,t})(w_{i,j,t} - \bar{w}_{i,t}), \cdots (3)$$

where $\bar{I}_{i,t}$ and $\bar{w}_{i,t}$ are a benchmark R&D intensity in industry i and a benchmark contribution to value added of industry i to the aggregate output of the business sector respectively. The benchmark values for $\bar{I}_{i,t}$ and $\bar{w}_{i,t}$ are taken as median over 12 highly developed countries (JP, US, SE, FI, DK, DE, FR, UK, AT, BE, NL, NO). The set of countries has been selected on basis of a cluster analysis grouping countries by technological and economic factors (see Reinstaller and Unterlass 2011). The selected countries show high scores in innovation and economic rankings and therefore it can be assumed that these countries are competitive in both their economic and innovation performance, i.e. that their sectoral R&D intensities are a plausible proxy for the amount of R&D investment needed to safeguard a position close to the global technological frontier. Catching-up countries will have different levels of R&D intensity which reflect their distance from the technological frontier and are as a result not included in the benchmark countries. The median (instead of the average) has been used to avoid any bias resulting from outliers in the data.

The first right hand side component of equation (2) presents the industry structure effect in aggregate BERD. It presents the intensity of aggregate business R&D if all business sectors would invest into R&D at levels equalling the cross country average. The second right hand side component of equation (2) captures the country effect on BERD. It is the weighted sum of the sector specific deviations of industry specific R&D intensities from the cross country industry specific average R&D intensity. Equation (3) instead decomposes the second right hand side (RHS) term of equation (2) further into an effect due to the change of R&D intensity in the industries of a country (second RHS term in equation 3) and an interaction

effect combining the effect of differences in industrial structure and the effect of change in R&D intensity across industries in a country (third RHS term in equation 3). The index *t* indexes time. This is needed for the comparison across time presented in the next section.

This decomposition allows for a comparison of R&D expenditures across countries by separating structural effects from country specific effects. Controlling for industry structure it is therefore possible to compare whether in the aggregate the industries in a country perform better or worse in comparison to other countries.

Comparison of structural and country effects of R&D intensities across countries over time

The decomposition by Smith and Sandven (1998) has the problem that it allows only for a cross sectional comparison across countries at a specific moment in time *t*. However, for the study of the impact of structural change on aggregate BERD intensity it is necessary to consider how structural change affects the comparison of BERD intensities across countries. The decomposition in equations (2) and (3) are not strictly comparable across time, as the average $\bar{I}_{i,t}$ next to all other values changes. It is therefore necessary to use averages for one specific base year in order to make results comparable over time. Indexing equation (2) with time *t+1* and expanding the two RHS terms in equation (2) with $(I_{i,j,t} - I_{i,j,t})$ we get

$$I_{M,j,t+1} = \sum_{i=1}^{n} I_{i,j,t} w_{i,j,t+1} + \sum_{i=1}^{n} (I_{i,j,t+1} - I_{i,j,t}) w_{i,j,t+1}. \cdots (4)$$

Expanding the two RHS terms in equation (4) with $(w_{i,j,t} - w_{i,j,t})$ yields

$$\begin{aligned} I_{M,j,t+1} == & \sum_{i=1}^{n} I_{i,j,t} w_{i,j,t} + \sum_{i=1}^{n} I_{i,j,t} (w_{i,j,t+1} - w_{i,j,t}) \\ & + \sum_{i=1}^{n} (I_{i,j,t+1} - I_{i,j,t})\, w_{i,j,t} + \\ & + \sum_{i=1}^{n} (I_{i,j,t+1} - I_{i,j,t}) \left(w_{i,j,t+1} - w_{i,j,t}\right), \cdots (5a) \end{aligned}$$

and after substituting (2) for the first RHS term in (5a) we get

$$\begin{aligned} I_{M,j,t+1} == & \sum_{i=1}^{n} \bar{I}_{i,t} w_{i,j,t} + \sum_{i=1}^{n} (I_{i,j,t} - \bar{I}_{i,t}) w_{i,j,t} + \sum_{i=1}^{n} I_{i,j,t} (w_{i,j,t+1} - w_{i,j,t}) \\ & + \sum_{i=1}^{n} (I_{i,j,t+1} - I_{i,j,t})\, w_{i,j,t} + \sum_{i=1}^{n} (I_{i,j,t+1} - I_{i,j,t}) \left(w_{i,j,t+1} - w_{i,j,t}\right). \cdots (5b) \end{aligned}$$

Equation (5b) combines now the decomposition in equation (2) with effects due to dynamic changes in the sectoral R&D intensities and the sectoral contributions to the aggregate value added in the business sector and hence structural change over time with respect to base year *t*. The time effects due to changes in the cross country industry average $\bar{I}_{i,t}$ vanish as differences are taken with the expansions needed for the decomposition.

Looking at the RHS components of equation (5b) one by one, we can interpret

(1) $\sum_{i=1}^{n} \bar{I}_{i,t} w_{i,j,t} + \sum_{i=1}^{n} (I_{i,j,t} - \bar{I}_{i,t}) w_{i,j,t}$ as the sector and country effects in base year *t*,

(2) $\sum_{i=1}^{n} I_{i,j,t}(w_{i,j,t+1} - w_{i,j,t})$ as the structural change effect over time period Δt,
(3) $\sum_{i=1}^{n}(I_{i,j,t+1} - I_{i,j,t})\, w_{i,j,t}$ as the effect due to changes of sectoral R&D intensities over time, and
(4) $\sum_{i=1}^{n}(I_{i,j,t+1} - I_{i,j,t})(w_{i,j,t+1} - w_{i,j,t})$ as the dynamic interaction effect of structural change and changes in sectoral R&D intensity.

Data

Sources and coverage

The aim of this analysis is to present a comprehensive picture of the influence of structural change on the development of R&D intensities in the business sector in the EU 27 countries and important non-EU countries. In order to carry out this comparison data from different sources have been consolidated into one data set. The principal data sources for this analysis are

- OECD STAN – Value Added, national currency current prices,
- OECD ANBERD – R&D Expenditures, national currency current prices,
- Eurostat BERD – R&D Expenditures, national currency current prices, and
- Eurostat Value Added, national currency, current prices.

Data for R&D decomposition, summary

	Data source			
	OECD STAN Value added	Eurostat Value added	OECD ANBERD	Eurostat BERD
Country coverage (ISO 3166 country codes)	AT BE CZ DE DK ES FI FR GR IE IS IT LU NL NO PL PT SE SI AU CA IL JP KR MX NZ US	BG CY EE HU LT LV MT RO SK TR	AU CA IL NZ SE	BE BG EE GR JP KR LU MT LT LV PL SK CZ CY
Time coverage in consolidated data set	1998-2005: GR 1998-2006: AU BG* CA ES JP* PT* UK 1998-2007: AT BE DK FR KR NL NO SE TR* US 1998-2008: CY CZ EE FI HU IE IS LT LV PL RO SI 1998-2009: IT SK DE 1999-2005: NZ 2000-2006: IL 2002-2008: MT			
Sector coverage in consolidated data set (NACE rev. 1.1, see Table 37)	Larger aggregates: 01-99, 15-37, 50-74, 75-99, 50-99 *Breakdown:* 01-05, 10-14, 15-16, 17-19, 20-22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36-37, 40-41, 45, 50-52, 55, 60-64, 65-67, 70+71+74, 72, 73			

Data issues and data manipulations

In assembling the database for the decomposition analysis several issues had to be dealt with. As it was the aim of the present analysis to maximise the data coverage of the EU 27 countries we relied, wherever possible, on the BERD data available from EuroStat. The

principal problems were missing values either for the value added or the BERD data, inconsistencies in the classification of industries across countries and/or over time leading in some cases discontinuities, gaps and anomalies in the data. It should be noted that whereas most countries follow the Frascati procedure and allocate R&D according to the main field of activity of the business unit, some countries allocate it according to product field (FR, SE, FI). This leads to an inconsistency of the sector data for these countries for which we cannot correct here. Some of the issue related to BERD data are discussed in OECD (2009). We limit ourselves to report here the most important manipulations we have operated on the data available from official sources:

- For the R&D data missing observations were calculated through linear interpolation or through extrapolation using the average growth rates of R&D expenditures in the entire business sector in a country. Where either the R&D expenditures or the value added was missing in one of the data sources we have used data from the other data source after consistency checks.
    - Missings completed using EuroStat value added: FR: sectors 23, 26, 10-14, 90, 74; PT: 10-14, 23,26; NO: 15, 16; IE: 23, 36-37; IS: 10-14, 26;
    - Missings completed using OECD data on value added: TR: sectors 01-05, 10-14
- For some countries (EE, SK) value added or R&D expenditures were reported in their national currency. Here the values were converted to Euros.
- Across countries some sectors have been aggregated into different sector groups. In this case the R&D data have been reassigned following the following formula:

$$RD_{1,j,t} = VA_{1,j,t} * \frac{\frac{\widehat{RD_1}}{\widehat{VA_{1,j,t}}} * \frac{RD_{1,j,t} + RD_{2,j,t}}{VA_{1,j,t} + VA_{2,j,t}}}{\frac{\widehat{RD_1 + RD_2}}{\widehat{VA_1 + VA_2}}},$$

  where RD_1 is the sector for which R&D data were missing, RD_2 the larger sector aggregate to which the missing data have been allocated. The hats indicate the reference value extracted either from prior observations for the sector in the same country or using the cross country average for that sector.

After these manipulations no structural breaks or other anomalies could be observed in the time series for R&D in each sector in each country used in the analysis.

Table 37: BERD NACE Rev. 1.1

	Codes Description
01-05	AGRICULTURE, HUNTING, FORESTRY AND FISHING
10-14	MINING AND QUARRYING
15-37	TOTAL MANUFACTURING
15-16	Food products, beverages and tobacco
17-19	Textiles, textile products, leather and footwear
20-22	Wood, paper, printing, publishing
23	Coke, refined petroleum products and nuclear fuel
24	Chemicals and chemical products
25	Rubber and plastics products
26	Other non-metallic mineral products
27	Basic metals
28	Fabricated metal products, except machinery and equipment
29	Machinery and equipment, n.e.c.
30	Office, accounting and computing machinery
31	Electrical machinery and apparatus, n.e.c.
32	Radio, television and communication equipment
33	Medical, precision and optical instruments
34	Motor vehicles, trailers and semi-trailers
35	Other transport equipment
36	Furniture; manufacturing n.e.c.
37	Recycling
40-41	ELECTRICITY, GAS AND WATER SUPPLY
45	CONSTRUCTION
50-99	TOTAL SERVICES
50-52	Wholesale and retail trade; repairs
55	Hotels and restaurants
60-64	Transport, storage and communications
65-67	Financial intermediation
70+71+74	Real estate, renting and other business activities
72	Computer and related activities
73	Research and development
75-99	Community, social and personal services

11.2.4. Technical Appendix for the energy intensity decomposition

The decomposition of national energy intensities follows the methodology described above for the case of R&D intensities. In the formulas, R&D intensity has to be substituted with energy intensity. This holds for both,

- the comparison of structural and country effects of energy intensities across countries
- the comparison of structural and country effects of energy intensities across countries over time

Data

Sources and coverage

The aim of this analysis is to present the influence of structural change on the development of energy intensities in 9 aggregated sectors in 17 EU countries, Switzerland and Norway. The analysis uses the following sources:

- OECD STAN – Value Added, national currency current prices
- OECD Purchasing Power Parities for GDP and related indicators – PPP 2007 in US dollar
- Eurostat NRG_100a (Supply, transformation, consumption) – thousand tons of oil equivalent for aggregate sectors

Country coverage (ISO 3166 country codes)	AT BE CH CZ DE DK EE ES FI FR GR HU IT NL NO SE SI SK UK
Time coverage	1999-2007
sector coverage in consolidated data set (NACE rev. 1.1, see Table A1)	Larger aggregates: 13-14, 15-16, 17-19,21-22,24,[25,33,36,37],26,27,28-32

Energy intensity

Energy intensity is defined as energy consumption over value added at constant prices, converted with purchasing power parity in the year 2007. It is measured in tons per thousand dollars value added.

$$energy\ intensity = \frac{energy\ consumption}{value\ added\ at\ constant\ prices\ converted\ to\ dollar\ with\ 2007\ PPP}$$

Value added at constant prices (VALK) is available in OECD STAN with 2000 as the base year. It has been rebased to 2007 for this analysis. Eurostat NRG_100a provides energy consumption only at a more aggregate level than STAN. STAN data had to be aggregated to match NRG_100a.

Data issues and data manipulations

In assembling the database for the decomposition analysis the principal problem was filling-up missing values either for the value added or the energy consumption data. For the energy

intensity data missing observations were calculated through linear interpolation or through extrapolation using the average growth rates of energy intensities in the observed sectors in a country. In case of three countries, a sector was completely missing (CH & FR: NACE13-14, NO: NACE24). In these cases we estimated the average energy intensity for the specific sectors over all countries for a given year. This expected sectoral energy intensity has been corrected for a country specific factor, by multiplying the overall energy intensity of the country divided through the overall energy intensity of all observed countries in the respective year. For FR (NACE 13-14) and NO (NACE 24) we also estimated the value added following the described procedure respectively.

After these manipulations no structural breaks or other anomalies could be observed in the time series for energy intensity in each sector in each country used in the analysis.

Mapping of sectors

The mapping between NRG_100a and STAN is derived from the metadata of NRG_100a

http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/DE/nrg_quant_esms.htm and http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/Annexes/nrg_quant_esms_an1.pdf .

NRG_100a		**STAN (NACE)**
B_101805	Iron and Steel	271+2731
B_101810	Non-Ferrous Metals	272+2732
B_101815	Chemical and Petrochemical	24
B_101820	Non-Metallic Minerals	26
B_101825	Mining and Quarrying	13-14
B_101830	Food and Tobacco	15-16
B_101835	Textile and Leather	17-19
B_101840	Paper, Pulp and Print	21-22
B_101845	Machinery:	28-32
B_101850	Not elsewhere specified:	25,33,36,37
B_101900	Final Energy Consumption - Transport	60,61,62

11.3. The impact of business cycles on industry performance

11.3.1. Regression output for the results in Section 7.5.1.

VALUE ADDED GROWTH				EMPLOYMENT GROWTH			
	Coefficient	St. Error	P-Value		Coefficient	St. Error	P-Value
GDP Gap	0.007	0.003	0.034 *	GDP Gap	0.004	0.002	0.047 *
Sectoral Technology Shock	0.046	0.001	0.000 ***	Sectoral Technology Shock	-0.015	0.000	0.000 ***
Sectoral Demand Shock	0.028	0.001	0.000 ***	Sectoral Demand Shock	0.022	0.000	0.000 ***
GDP Gap × Sector				GDP Gap × Sector			
17t19	0.003	0.005	0.577	17t19	0.003	0.002	0.229
20	0.000	0.005	0.956	20	0.007	0.002	0.007 **
21t22	-0.001	0.005	0.894	21t22	0.004	0.002	0.092 .
23	0.005	0.005	0.274	23	0.005	0.002	0.069 .
24	0.000	0.005	0.948	24	0.005	0.002	0.047 *
25	-0.003	0.005	0.564	25	0.007	0.002	0.003 **
26	0.004	0.005	0.409	26	0.011	0.002	0.000 ***
27t28	0.009	0.005	0.066 .	27t28	0.010	0.002	0.000 ***
29	0.014	0.005	0.004 **	29	0.006	0.002	0.023 *
30t33	0.006	0.005	0.216	30t33	0.008	0.002	0.001 **
34t35	-0.002	0.005	0.657	34t35	0.009	0.002	0.001 ***
36t37	0.006	0.005	0.185	36t37	0.007	0.002	0.003 **
50	0.002	0.005	0.605	50	-0.001	0.002	0.686
51	0.004	0.005	0.363	51	0.002	0.002	0.426
52	0.003	0.005	0.587	52	0.001	0.002	0.838
60t63	0.006	0.005	0.241	60t63	0.003	0.002	0.268
64	0.007	0.005	0.157	64	0.005	0.002	0.064 .
70	-0.004	0.005	0.419	70	-0.001	0.002	0.733
71t74	0.008	0.005	0.115	71t74	0.011	0.002	0.000 ***
AtB	0.003	0.005	0.505	AtB	-0.003	0.002	0.269
C	0.001	0.005	0.881	C	0.002	0.002	0.466
E	-0.004	0.005	0.370	E	-0.002	0.002	0.507
F	0.010	0.005	0.034 *	F	0.014	0.002	0.000 ***
H	-0.001	0.005	0.882	H	0.001	0.002	0.604
J	0.000	0.005	0.939	J	0.002	0.002	0.480
L	-0.006	0.005	0.210	L	-0.003	0.002	0.177
M	-0.007	0.005	0.170	M	-0.003	0.002	0.272
N	-0.005	0.005	0.266	N	-0.002	0.002	0.500
O	0.000	0.005	0.922	O	-0.001	0.002	0.682
Country Dummies		F(17574,17557)	40.0 ***	Country Dummies		F(17574,17557)	81.6 ***
Sector Dummies		F(17615,17557)	16.1 ***	Sector Dummies		F(17615,17557)	59.8 ***
Intersept	0.001	0.002	0.673	Intersept	0.016	0.004	0.000 ***
Obs.	17636			Obs.	17636		
Adj. R-squared:	0.35			Adj. R-squared:	0.405		

11.3.2. Theoretical justification for the methodology used in this report

We use the two laws of motion driving the model of Pasinetti (1993) to specify the sectoral structural VAR models (SVAR) from which we recover structural productivity and demand shocks for each sector (see also Hölz and Reinstaller 2007a, 2007b). The first of these two dynamic processes is linked to the empirical evidence that all technical progress eventually is labour saving. Therefore, labour productivity tends to increase in the long run at sector specific rates. The second dynamics is determined by Engel's law. In the literature on consumer behaviour it is usually postulated that agents have some predetermined hierarchy of needs which they try to satisfy through consumption, updating their behaviour as their income changes permanently or as new products become available. This may happen through a smoothing process in which agents try to keep the marginal utility of income constant as news about new products and changes in income arrive, as claimed by the life-cycle literature. They will drive the persistent rise or decline in sectoral demand that follows from Engel's law. This may be amplified by substitutability or complementarity relationships among goods. Changes related to both these processes will show as `innovations' or shocks to the rate of change of sectoral labour coefficients and sectoral consumption coefficients.

In line with his model and following also more recent evidence presented by Basu (1996) we assume that in each sector there is a fixed-coefficient production relation selected from a set

of alternative fixed-coefficient technologies. Using the notation used in Pasinetti (1993) the development of the labour coefficient in sector i at any time t is given by:

$$l_{i,t} = l_{i,t-1} e^{-\rho_{i,t}} \tag{1}$$

The labour coefficients $l_{i,t}$ are interpreted as the hours per worker needed to produce one unit of output in sector i. The parameter $-\rho_{i,t}$ reflects the rate of productivity change. The second process driving structural change is consumption. It is measured as per-capita consumption of the physical output produced in each sector i. Demand changes at a rate $r_{i,t}$ that is different from the rate of productivity change

$$c_{i,t} = c_{i,t-1} e^{r_{i,t}} \tag{2}$$

Given these two laws of motion the prices and physical outputs in each sector *i* are determined by

$$p_{i,t} = l_{i,t-1} e^{-\rho_{i,t}} w_{i,t} \tag{3}$$

$$Q_{i,t} = c_{i,t-1} N_{t-1} e^{g+r_{i,t}} \tag{4}$$

where $w_{i,t}$ represent the average unit cost in sector *i* and N_{t-1} represents the total population at time *t-1* in an economy growing at an exogenous and constant rate *g*. The dynamics of employment in each industry follows from equations (3) and (4). The total amount of hours worked in each sector *i* at time *t* is given by

$$h_{i,t} = l_{i,t-1} c_{i,t-1} N_{t-1} e^{g+r_{i,t}-\rho_{i,t}} \tag{5}$$

Using total hours worked in the place of employment allows to account for effects of labour hoarding and other manifestations of labour market rigidities, as well as capacity expansion that does not influence productivity. Given this relationship, the long-run changes in hours worked and employment depend on both changes in productivity and changes in demand. The growth rates $-\rho_{i,t}$ and $r_{i,t}$ change continuously, as productivity and demand vary due to learning processes. It is consistently observed in the empirical literature that the series of productivity and hours worked follow an I(1) process. Therefore, we express the growth rate of sectoral consumption as

$$r_{i,t} = \zeta_i^d + \sigma_{i,t}^d + \gamma_{x,i}^d \sigma_{x,t}^d \tag{6}$$

were ζ_i^d is a constant, sector specific mean in the growth of sectoral consumption, $\sigma_{i,t}^d$ is a contemporaneous demand `innovation' reflecting a change in consumer behaviour with permanent effects. We have to take into account that empirical series carry information on short run economic changes, such as business cycles. The long run patterns in sectoral demand development should be distinguished from the effects of unanticipated changes in aggregate income leading to fluctuations in output. Therefore, $\gamma_{x,i}^d \sigma_{x,t}^d$ is the response of the rate of change of sectoral demand coefficients to aggregate business cycle shocks $\sigma_{x,t}^d$. If the sector is small as compared to the aggregate economy $\sigma_{x,t}^d$ will be exogenous to the sector. Although the discussion about the relationship between consumer reactions to business cycles and their long run consumption patterns is far from settled (Attanasio and Browning 1995, Lettau and Uhlig 1999, Carroll 2001), it is plausible to assume that business cycles do not affect consumer behaviour in the long run but that they learn to smooth their spending over business cycles.

The development of productivity over time reflects technical change. As such it is the outcome of a stochastic process which has permanent effects on sectoral labour coefficients. On the other hand, it is also well known that observed labour productivity fluctuates pro-cyclically. It has been argued that this has to do with variations in the degree of capacity utilization (see Basu 1996). Following the same steps as before we can specify the productivity growth rate as

$$\rho_{i,t} = \zeta_i^p + \sigma_{i,t}^p + \gamma_{x,i}^p \sigma_{x,t}^p + \gamma_i(\sigma_{i,t}^d + \gamma_{x,i}^d \sigma_{x,t}^d) \tag{7}$$

and as a consequence the growth rate of hours worked as

$$g + r_{i,t} - \rho_{i,t} = \zeta_i^h - \sigma_{i,t}^p - \gamma_{x,i}^p \sigma_{x,t}^p + (1-\gamma_i)\sigma_{i,t}^d + \gamma_{x,i}^d (1-\gamma_i)\sigma_{x,t}^d, \tag{8}$$

where ζ_i^h is a constant, sector specific mean, $\zeta_i^h = g + \zeta_i^d - \zeta_i^p$, and variable $\sigma_{i,t}^p$ is a contemporaneous productivity shock that mirrors genuine productivity improvements. The term $\gamma_{x,i}^p \sigma_{x,t}^p$ is the response of labour productivity in sector *i* to an aggregate productivity shock $\sigma_{x,t}^p$. We interpret the aggregate productivity shock as a weighted combination of all productivity shocks outside a specific industry that have an effect on and therefore correlate with the sectoral productivity shock. In order to identify the genuine sectoral productivity shock, we have to control for this ``imported productivity''. The term $\gamma_i(\sigma_{i,t}^d + \gamma_{x,i}^d \sigma_{x,t}^d)$ captures the effect which changes in the growth rate of demand have on capacity utilization and hence on measured productivity, where γ_i is the response of productivity in sector *i* if capital utilization changes as a consequence of `innovations' in demand. We assume that $\sigma_{i,t}^p$, $\sigma_{i,t}^d$, $\sigma_{x,t}^d$ and $\sigma_{x,t}^p$ are orthogonal with respect to each other and that all shocks are i.i.d. random variables with mean zero and finite variance. In this case the growth rates of consumption and productivity will be stationary.

The structural shocks $\sigma_{i,t}^p$ and $\sigma_{i,t}^d$ cannot be observed directly. However, as the growth rates of productivity and hours worked are affected by the same shocks a SVAR model can be used to identify them. This can be illustrated by looking at the solution to difference equation (1). Taking logs (indicated by the hats over the variables) and using our definitions of the growth rates of productivity (7), we get

$$\hat{l}_{i,t} - \hat{l}_{i,0} = -(\zeta_i^p t - \sum_{\tau=0}^{t-1} \sigma_{i,t-\tau}^p - \sum_{\tau=0}^{t-1} \gamma_{x,i}^p \sigma_{x,t-\tau}^p + \sum_{\tau=0}^{t-1} \gamma_i(\sigma_{i,t-\tau}^d + \gamma_{x,i}^d \sigma_{x,t-\tau}^d), \tag{9}$$

As productivity is *I(1)* the stochastic trend in equation (9) imparts a permanent, although random, change to the conditional mean of productivity variations. It consists of productivity shocks $\sum_{\tau=0}^{t-1} \sigma_{i,t-\tau}^p$, the response of sectoral to aggregate productivity shocks $\sum_{\tau=0}^{t-1} \gamma_{x,i}^p \sigma_{x,t-\tau}^p$ that have to be controlled for and shocks that are due to changes in the degree of capital utilization, $\sum_{\tau=0}^{t-1} \gamma_i(\sigma_{i,t-\tau}^d + \gamma_{x,i}^d \sigma_{x,t-\tau}^d)$. The latter do not reflect `true' productivity changes and should therefore have only transitory effects on the productivity level. By controlling for the exogenous

business cycle shocks $\sigma^{d}_{x,t-\tau}$ and imposing the long-run restriction $\sum_{\tau=0}^{t-1}\gamma_i\sigma^{d}_{i,t-\tau}=0$ this condition is met as the effects of changes in the degree of capital utilization vanish.

1. COUNTRY ANNEX

Introduction – Guide to the country annex

To describe the countries, we define the following terms:

Industries refer to 3-digit NACE units; sectors to more aggregated 2-digit NACE units. We will use the terms industry vs. trade specialisation interchangeably with value added vs. export specialisation to denote different patterns of specialisation in exports to international markets and in total domestic value added.

Sectors with high innovation intensity may shortly be called high innovation sectors, the same holds true for sectors with high educational intensity (high education sectors). High innovation sectors feature a high amount of product (and process) innovations. High education sectors feature a high share of highly qualified employees. Technology-driven industries are basically R&D intensive.

As an overarching term for high innovation, high education and technology-driven we will use the adjective "knowledge-intensive".

The assessment of the impact of the crisis is based on revealed comparative advantage trends in industries in the crisis years 2007-2010 and 2007-2009 in sectors including services exports.

All the indicators for the spider webs and the years they refer to are described in the table below (table 5 in chapter 5.6 of the main report).

Note that the indicators for the low price segment of exports are inverted, i.e. above the EU average means that the share is actually lower than in the EU, hence indicating a performance superior to the EU average.

A country is said to be similar to group average when both country and group are either below or above the EU average, i.e. when they share the same sign for their deviation relative to the EU average; it is said to be contrasting with group average when the country and the group do not share the same sign. All the export data include intra-EU exports. For further details, see the technical appendix.

Table: Indicators for spider figures

Abbreviation	Description	Level (year)	Change (years)
RVA, LI	Value added shares in labour-intensive industries relative to EU 27	2006, 2007 or 2008 depending on data availability	1999/2007
RVA, LI & Low Skill (Country profile only)	Value added shares in labour-intensive and low-skill industries relative to EU 27	2006, 2007 or 2008 depending on data availability	1999/2007
RVA, TD	Value added shares in technology-driven industries relative to EU 27	2006, 2007 or 2008 depending on data availability	1999/2007
RVA, Edu High	Value added shares in high-education sectors relative to EU 27	2006 or 2007 depending on data availability	1999/2007
RVA, Edu Low	Value added shares in low-education sectors relative to EU 27	2006 or 2007 depending on data availability	1999/2007
RVA, Inno High	Value added shares in high-innovation sectors relative to EU 27	2006 or 2007 depending on data availability	1999/2007
RVA, Inno Low	Value added shares in low-innovation sectors relative to EU 27	2006 or 2007 depending on data availability	1999/2007
RCA, LI	Revealed comparative advantage in labour-intensive industries	2010	1999/2010
RCA, TD	Revealed comparative advantage in technology-driven industries	2010	1999/2010
RCA, Inno High	Revealed comparative advantage in high-innovation sectors	2009	-
RCA, Inno Low	Revealed comparative advantage in low-innovation sectors	2009	-
BRIC, TD	Exports to BRIC-countries as a share of total exports by technology-driven industries	2010	1999/2010
High Growth Firms, Inno High	Share of high growth enterprises in the population of active enterprises, measured in employment	2007	-
High Price Exports, LI (country profiles only)	Share of exports in high quality price segments within labour-intensive industries	2009	1999/2009
High Price Exports, TD (country profiles only)	Share of exports in high quality price segments within technology-driven industries	2009	1999/2009
Low Price Exports, LI (country profiles only); inverted	Share of exports in low quality price segments within labour-intensive industries	2009	1999/2009
Low Price Exports, TD; inverted	Share of exports in low quality price segments within technology-driven industries	2009	1999/2009
RD Intensity	Business Enterprise R&D Intensity	2005, 2006 or 2007 depending on data availability	2004/2007
RD, Country Effect	Difference between the structurally adjusted and the actual R&D intensity of the business sector	2005, 2006 or 2007 depending on data availability	2004/2007

1.1. Belgium

Trade and industry specialisation

At the detailed manufacturing industry level, Belgium is specialised in capital-intensive industries such as iron processing, basic chemicals and man-made fibres. At the more aggregated sector level, Belgium is specialised in sectors featuring medium-high educational and innovation intensity, such as chemicals, coke and refined petroleum, but also textiles. In contrast with its group membership, it does on average not feature specialisation in technology-driven or highly innovative industries, even more so when looking at trade indicators rather than value added indicators, in spite of having an export specialisation in pharmaceuticals and a specialisation in TV, radio and recording apparatus, both technology-driven industries. Its share of exports to BRICs (in exports by technology-driven industries) is below the EU average, indicating potential to exploit growth opportunities by increasing exports to the fast growing BRICs.

Export quality and sectoral R&D performance

Belgium's sectoral R&D and export quality performance is positive: R&D intensity is above the EU average given its industrial structure (R&D country effect). The shares in the low price segments of exports are below the EU average, in high price segments above the EU average, indicating that Belgium is high up on the quality ladder.

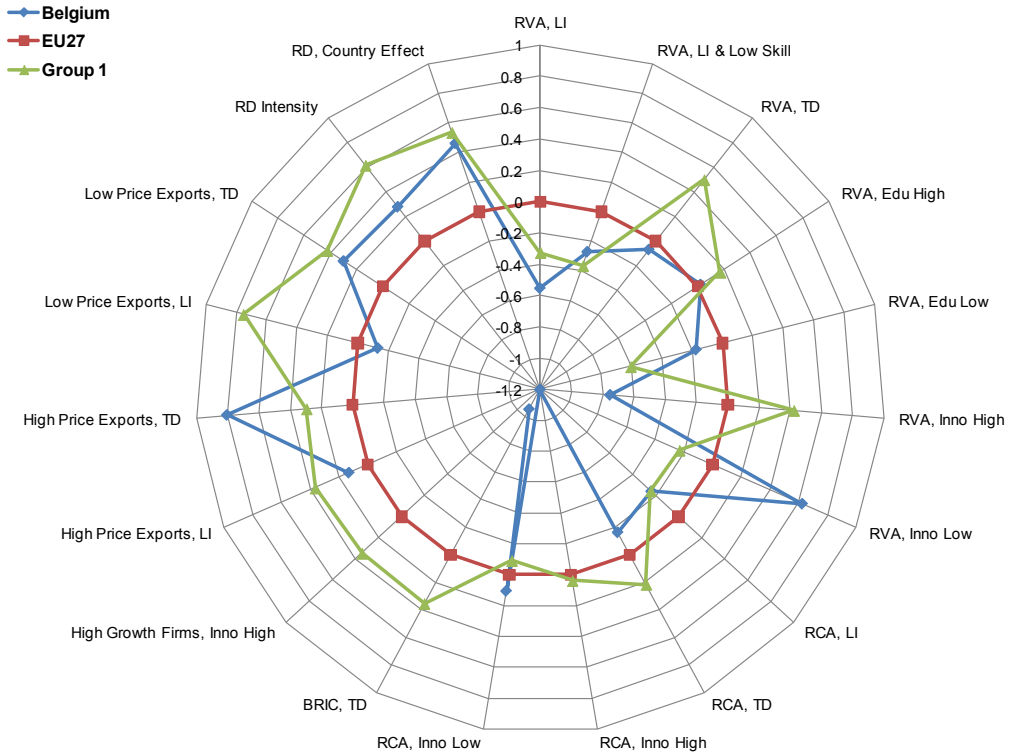
Structural change

In terms of change, Belgium has considerably increased its specialisation in higher quality market segments. It has increased its sectoral R&D intensity and its relative share of valued added in high-education sectors such as computers and business services, and in exports by technology-driven industries, such as in pharmaceuticals and pesticides. It has decreased even further its share of labour intensive industries. Overall, on many indicators relevant for competitiveness (specialisation, R&D, quality ladder) Belgium has become more like a typical member of the group of higher income countries specialised in knowledge-intensive sectors, pointing to favourable prospects for competitiveness.

Impact of the crisis

The impact of the crisis in terms of structural change was limited in Belgium, with slight trend reversals in export specialisation in marketing-driven (positive) and technology-driven industries (negative).

Graph A1.1: Level



Graph A1.2: Change

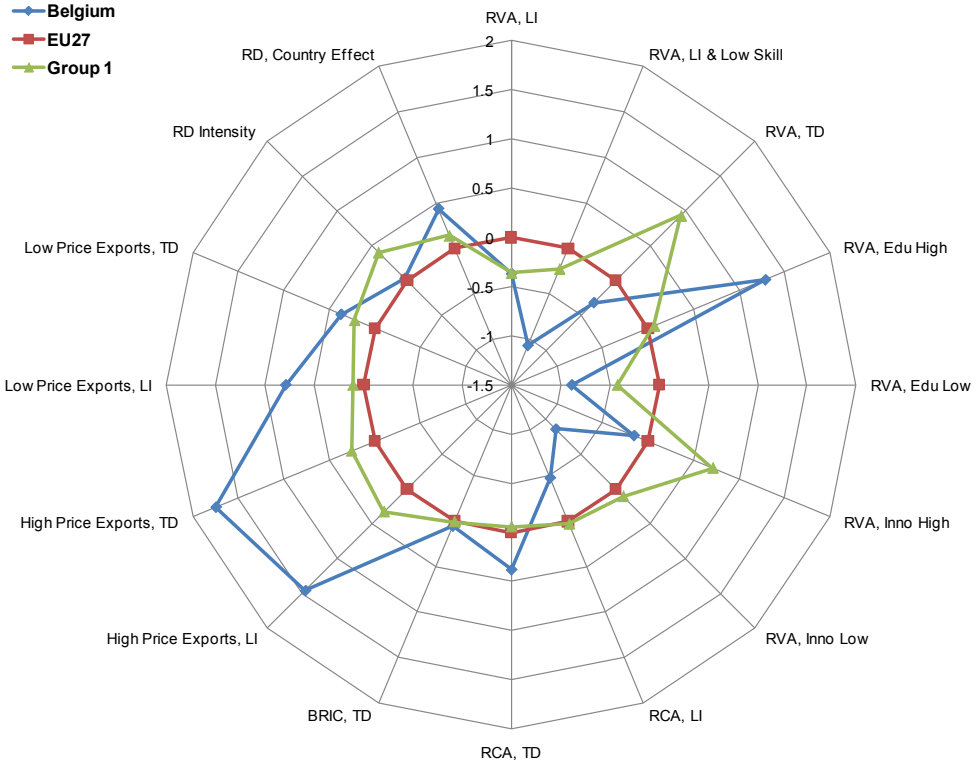


Table A1.1: Summary table - Belgium

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2007	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
																Percentage points						
Factor inputs																						
Mainstream industries	-0.153	-0.038									-0.367	-0.184	-0.002	0.833	0.563	0.201	30.428	27.958				
Labourintensive industries	-0.277	-0.053									-0.186	-0.259	-0.051	0.415	0.299	0.066	38.356	28.485				
Capital intensive industries	0.535	0.061									0.385	-0.002	0.009	1.600	1.140	0.570	16.747	42.283				
Marketing driven industries	-0.062	0.012									-0.021	-0.073	0.033	0.241	0.088	0.062	18.482	36.060				
Technology driven industries	-0.029	-0.031									-0.070	0.126	-0.022	1.159	0.842	0.453	63.690	10.329				
Skill intensity																						
Low skill industries	0.157	-0.029																				
Medium/blue collar workers	-0.328	-0.111																				
Medium/white collar workers	0.093	0.043																				
High skill industries	-0.036	0.161																				
Labour intensive and low skill industries	-0.271	-0.255																				
Revealed quality elasticity																						
High RQE	-0.154	-0.049									-0.075	0.007	-0.025	2.055	1.501	0.647	55.842	12.924				
Medium RQE	-0.040	0.018									-0.120	0.008	0.072	0.728	0.472	0.225	19.667	40.232				
Low RQE	0.230	0.023									0.215	-0.040	-0.012	1.464	0.959	0.479	19.469	39.579				
INNOTYPE											2009	Change 2004/2009	Change 2007/2009									
High	-0.351	-0.030	5.323	-0.202	-0.405	3.227	n.a.	3	1	-	-0.584	0.003	0.043						0.521	0.130	-0.013	-0.013
Med-high	0.313	-0.047	14.581	-1.660	-0.454	1.213	n.a.	4	1	-	0.324	0.007	-0.020						0.620	-0.105	-0.034	0.095
Med	0.008	0.163	22.861	0.992	-0.459	0.059	n.a.	3	-1	+	-0.324	-0.087	0.101						0.063	-0.004	-0.003	0.000
Med-low	0.040	-0.142	8.091	-1.715	-0.570	-3.968	n.a.	3	-1	0	0.041	-0.012	-0.003						0.210	0.038	-0.001	0.017
Low	0.119	-0.134	18.256	1.475	-0.413	-1.667	n.a.	3	1	-	0.105	0.166	0.030						0.026	0.002	-0.001	-0.006
EDUTYPE																						
High	0.006	0.194	21.587	1.947	-0.458	-0.339	n.a.	4	-1	+	-0.398	0.013	0.370									
Med-high	0.385	0.086	9.076	-0.490	-0.159	-3.692	n.a.	3	1	-	0.319	0.077	-0.019									
Med	-0.041	0.029	38.639	-0.508	-0.358	-1.928	n.a.	4	1	-	-0.267	-0.123	-0.041									
Med-low	-0.077	-0.147	10.447	-0.179	-0.560	0.355	n.a.	3	0	0	0.107	-0.005	-0.054									
Low	-0.036	-0.093	20.251	-0.769	-0.470	1.038	n.a.	3	-1	0	-0.067	-0.033	-0.061									
Total	0.000	0.000	100.000	0.000	-0.452	0.000	n.a.	1	0	0	0.000	0.000	0.000	4.248	2.932	1.351	34.952	28.420	1.481	0.088	-0.052	0.104

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A1.2: Selected Sectors I - Belgium

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
362	Manufacture of jewellery and related articles	1.297
241	Manufacture of basic chemicals	0.904
244	Manufacture of pharmaceuticals, medicinal chemicals and botanical products	0.737
153	Processing and preserving of fruit and vegetables	0.726
247	Manufacture of man-made fibres	0.575
Top-3 sectors (NACE 2-digit)		
24	Chemicals and chemical products	0.690
23	Coke, refined petroleum and nuclear fuel	0.439
36	Furniture, jewellery, musical instruments, sports goods, games and toys	0.175

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
273	Other first processing of iron and steel and production of non-ECSC ferro-alloys	1.122
323	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	1.118
175	Manufacture of other textiles	1.114
23	Manufacture of coke, refined petroleum products and nuclear fuel	0.995
314	Manufacture of accumulators, primary cells and primary batteries	0.837
Top-3 sectors (NACE 2-digit)		
23	Coke, refined petroleum and nuclear fuel	1.057
24	Chemicals and chemical products	0.722
17	Textiles and textile products	0.637

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
242	Manufacture of pesticides and other agro-chemical products	0.773
263	Manufacture of ceramic tiles and flags	0.665
354	Manufacture of motorcycles and bicycles	0.582
244	Manufacture of pharmaceuticals, medicinal chemicals and botanical products	0.506
363	Manufacture of musical instruments	0.457
282	Manufacture of tanks, reservoirs and containers of metal; manufacture of central heating radiators and boilers	-0.807
335	Manufacture of watches and clocks	-0.884
323	Manuf. of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	-0.897
352	Manufacture of railway, tramway locomotives, rolling stock	-1.073
233	Nuclear fuel	-1.387
The 3 winning and 3 losing sectors (NACE 2-digit)		
33	Medical, precision and optical instruments	0.281
24	Chemicals and chemical products	0.202
19	Leather, leather and footwear	0.188
36	Furniture, jewellery, musical instruments, sports goods, games and toys	-0.377
34	Motor vehicles, trailers and semi-trailers	-0.399
32	Radio, television and communication equipment	-0.426

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
23	Manufacture of coke, refined petroleum products and nuclear fuel	1.303
323	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	1.040
202	Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board and other panels and boards	0.791
176	Manufacture of knitted and crocheted fabrics	0.544
283	Manufacture of steam generators, except central heating hot water boilers	0.385
265	Manufacture of cement, lime and plaster	-0.577
246	Manufacture of other chemical products	-0.785
315	Manufacture of lighting equipment and electric lamps	-0.917
247	Manufacture of man-made fibres	-1.114
242	Manufacture of pesticides and other agro-chemical products	-1.167
The 3 winning and 3 losing sectors (NACE 2-digit)		
23	Coke, refined petroleum and nuclear fuel	1.404
61	Water transport	0.342
16	Tobacco products	0.334
40	Electricity and gas	-0.373
60	Inland transport	-0.571
37	Recycling	-0.868

Source: Eurostat (SBS, Comext).

Table A1.3: Selected Sectors II - Belgium

Revealed comparative advantage (RCA)

		RCA (export)			Export shares in price segments					
		2010	Change 1999/2010	Change 2007/2010	2009 in %	Low Change 1999/2009	Change 2007/2009	2009 in %	High Change 1999/2009	Change 2007/2009
Top-5 industries (NACE 3-digit)						in percentage points			in percentage points	
362	Manufacture of jewellery and related articles	1.297	-0.316	-0.129	0.807	0.287	0.656	99.193	11.322	-0.256
241	Manufacture of basic chemicals	0.904	0.100	0.017	33.787	5.003	2.793	23.533	8.127	4.789
244	Manufacture of pharmaceuticals, medicinal chemicals and botanical products	0.737	0.506	-0.078	3.491	-9.278	2.246	80.010	11.447	-1.590
153	Processing and preserving of fruit and vegetables	0.726	0.050	0.058	52.660	10.756	-4.572	2.194	-16.575	-9.152
247	Manufacture of man-made fibres	0.575	0.097	0.307	47.815	11.282	-15.472	10.401	-23.720	4.652

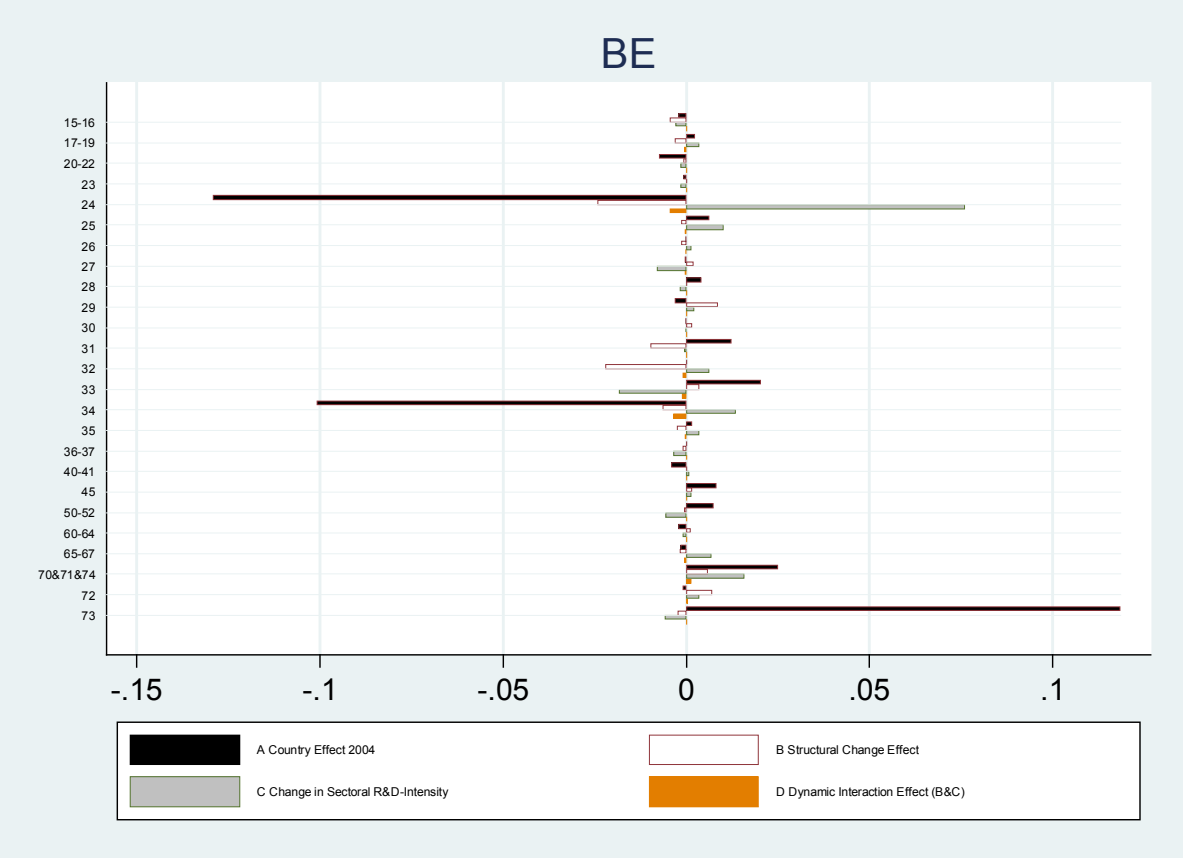
Relative value added (RVA)

		RVA		RCA (export)			Export shares in price segments					
		2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Low Change 1999/2007	Change 2007/2009	2007	High Change 1999/2007	Change 2007/2009
Top-5 industries (NACE 3-digit)								in percentage points			in percentage points	
273	Other first processing of iron and steel and production of non-ECSC ferro-alloys	3.072	-0.488	-0.131	0.078	-0.069	65.074	7.574	-7.657	13.162	6.426	8.450
323	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	3.058	1.017	-0.515	-0.653	-0.244	13.566	7.367	-4.490	68.942	26.253	4.155
175	Manufacture of other textiles	3.046	-0.266	0.666	-0.263	-0.149	36.211	4.846	0.884	30.184	-2.297	-1.744
23	Manufacture of coke, refined petroleum products and nuclear fuel	2.704	1.403	0.353	-0.195	0.086	-	-	-	-	-	-
314	Manufacture of accumulators, primary cells and primary batteries	2.309	-0.717	0.256	-0.420	0.117	8.712	-3.355	-0.374	68.511	41.013	2.700

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext).

Graph A1.3: Sectoral R&D decomposition: Change in structure, R&D intensity and interaction between structure and intensity, NACE-2-digit level



1.2. Bulgaria

Trade and industry specialisation

At the detailed manufacturing industry level, Bulgaria is specialised in labour-intensive industries (preparation and spinning of textile fibres, manufacture of other wearing apparel and accessories), in capital-intensive industries (manufacture of cement, lime and plaster) and finally in marketing-driven industries (manufacture of grain mill products). In the top 5 industries, mainstream manufacturing industries (such as the manufacture of batteries) can also be found. At the more aggregated sector level, Bulgaria is characterised by strong trade specialisation in sectors with a low intensity of innovative activity and low educational intensity, such as wearing apparel and recycling. Its share of exports to the BRIC countries is below the EU average. The high share of high growth enterprises in the population of active enterprises indicates that Bulgaria is catching up.

Export quality and sectoral R&D performance

Bulgaria's R&D intensity is below the average given its industrial structure. The shares in low price segments of exports by technology driven industries are above the EU average, while the shares in high price segments are below the EU average, indicating an unfavourable position on the quality ladder. Overall, Bulgaria is a typical member of the group of countries featuring relatively lower income levels and specialisation in labour-intensive industries.

Structural change

In terms of change, Bulgaria shows a different picture to its current position, almost the flip side. It increased the relative value added shares in high education sectors (such as in computers and software), and exports in technology-driven industries (such as the manufacture of radio and TV transmitters). However, the specialisation in labour-intensive low-skill industries (such as in the manufacture of wearing apparel) continued to increase.

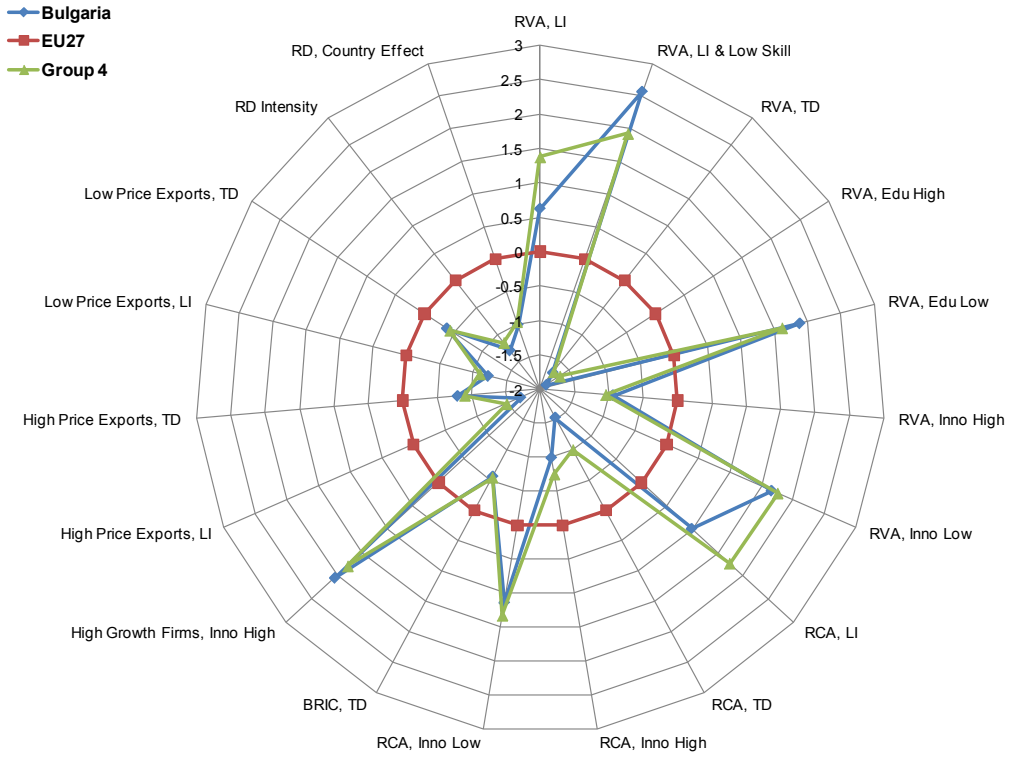
Bulgaria shows a strong improvement in export quality, it increased shares in high price exports and decreased export shares in low price segments considerably. However, the sectoral R&D intensity decreased relative to the change of the EU average; a positive change in sectoral R&D intensity was recorded in machinery and software.

Overall, Bulgaria can be seen as catching up with respect to competitiveness, in particular as regards specialisation and the quality ladder, but not with respect to R&D.

Impact of the crisis

The crisis seems to have accelerated Bulgaria's structural change towards more advanced and knowledge-intensive industries and sectors, as demonstrated by the sizeable gains in exports by technology-driven and mainstream manufacturing industries.

Graph A2.1: Level



Graph A2.2: Change

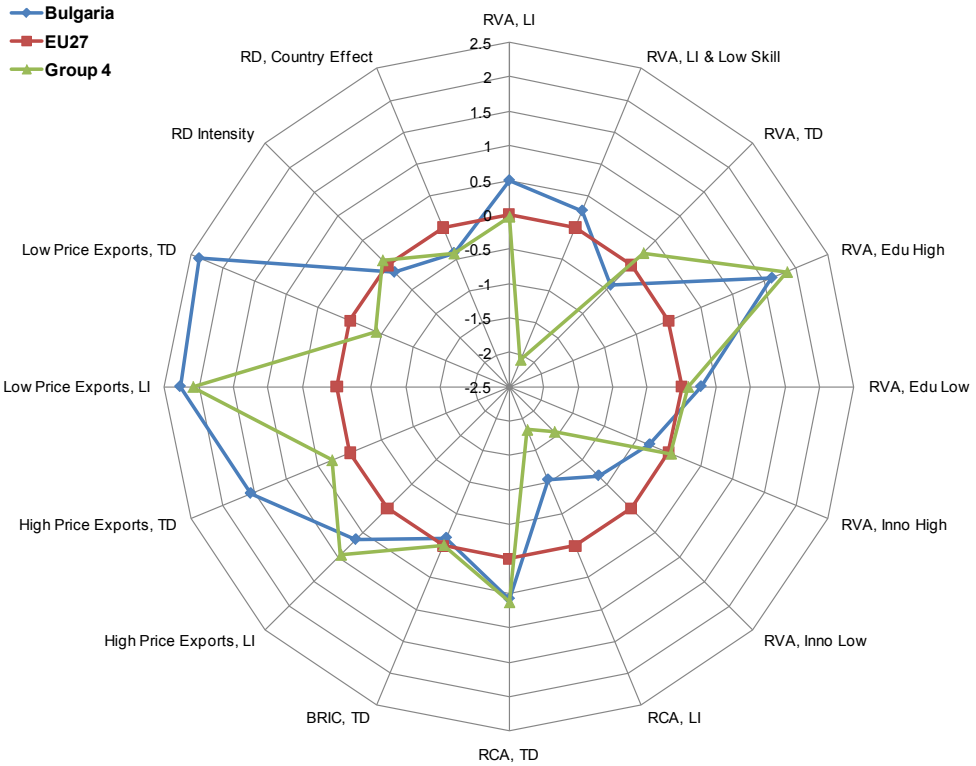


Table A2.1: Summary table - Bulgaria

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2007	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
																Percentage points						
Factor inputs																						
Mainstream industries	-0.049	0.100									-0.200	0.204	0.100	1.015	-0.139	0.081	10.374	73.661				
Labourintensive industries	0.238	0.044									0.538	-0.271	-0.110	0.331	-0.021	0.038	7.801	58.450				
Capital intensive industries	0.397	0.037									0.581	-0.075	-0.130	1.644	1.195	0.458	6.725	47.100				
Marketing driven industries	0.145	-0.146									0.091	-0.259	0.266	0.408	-1.496	-0.262	20.228	56.294				
Technology driven industries	-1.137	-0.116									-1.045	0.665	0.416	1.724	-0.061	1.066	29.271	36.587				
Skill intensity																						
Low skill industries	0.609	0.084																				
Medium/blue collar workers	-0.602	0.278																				
Medium/white collar workers	-0.334	-0.122																				
High skill industries	-0.363	-0.331																				
Labour intensive and low skill industries	1.173	0.017																				
Revealed quality elasticity																						
High RQE	-0.207	-0.258									-0.540	-0.284	0.006	2.460	-0.181	0.814	19.729	51.971				
Medium RQE	-0.049	-0.042									0.219	0.268	0.037	0.819	-0.991	0.015	8.811	54.156				
Low RQE	0.288	0.357									0.392	-0.010	-0.030	1.844	0.651	0.551	8.970	56.441				
											2009	Change 2004/2009	Change 2007/2009									
INNOTYPE																						
High	-0.461	-0.063	n.a.	n.a.	0.029	5.603	n.a.	n.a.	n.a.	n.a.	-0.457	0.423	0.153						0.064	-0.358	0.000	0.030
Med-high	0.195	-0.132	n.a.	n.a.	0.088	-1.968	n.a.	n.a.	n.a.	n.a.	0.120	0.077	-0.080						0.019	-0.315	-0.001	-0.006
Med	-0.592	0.333	n.a.	n.a.	0.128	7.650	n.a.	n.a.	n.a.	n.a.	-0.310	0.003	0.064						0.017	-0.058	0.005	-0.009
Med-low	0.451	-0.321	n.a.	n.a.	0.269	-10.317	n.a.	n.a.	n.a.	n.a.	0.158	0.307	0.325						0.039	-0.202	-0.002	0.007
Low	0.292	-0.089	n.a.	n.a.	0.060	-5.563	n.a.	n.a.	n.a.	n.a.	0.778	-0.606	-0.088						0.002	-0.035	0.000	-0.001
EDUTYPE																						
High	-0.781	0.666	n.a.	n.a.	0.108	12.611	n.a.	n.a.	n.a.	n.a.	-1.126	-0.032	0.162									
Med-high	-0.347	-0.549	n.a.	n.a.	-0.190	-0.133	n.a.	n.a.	n.a.	n.a.	-0.254	0.290	-0.111									
Med	0.062	0.094	n.a.	n.a.	0.185	4.770	n.a.	n.a.	n.a.	n.a.	-0.742	0.333	0.151									
Med-low	-0.078	-0.217	n.a.	n.a.	0.172	-3.634	n.a.	n.a.	n.a.	n.a.	-0.183	-0.364	-0.007									
Low	0.323	0.021	n.a.	n.a.	0.230	0.029	n.a.	n.a.	n.a.	n.a.	0.770	-0.093	0.008									
Total	0.000	0.000	n.a.	n.a.	0.179	0.000	n.a.	n.a.	n.a.	n.a.	0.000	0.000	0.000	5.123	-0.522	1.380	45.608	54.392	0.142	-0.996	0.002	0.020

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A2.2: Selected Sectors I - Bulgaria

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
171	Preparation and spinning of textile fibres	1.825
274	Manufacture of basic precious and non-ferrous metals	1.658
314	Manufacture of accumulators, primary cells and primary batteries	1.515
182	Manufacture of other wearing apparel and accessories	1.480
156	Manufacture of grain mill products, starches and starch products	1.400
Top-3 sectors (NACE 2-digit)		
18	Wearing apparel, dressing and dyeing of fur	1.451
27	Basic metals	1.131
16	Tobacco	1.123

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
177	Manufacture of knitted and crocheted articles	1.940
182	Manufacture of other wearing apparel and accessories	1.869
314	Manufacture of accumulators, primary cells and primary batteries	1.722
265	Manufacture of cement, lime and plaster	1.718
16	Manufacture of tobacco products	1.475
Top-3 sectors (NACE 2-digit)		
18	Wearing apparel, dressing and dyeing of fur	1.900
16	Tobacco products	1.529
37	Recycling	1.050

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
316	Manufacture of electrical equipment n.e.c.	2.594
176	Manufacture of knitted and crocheted fabrics	2.476
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	2.172
293	Manufacture of agricultural and forestry machinery	2.107
354	Manufacture of motorcycles and bicycles	1.910
205	Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials	-1.487
264	Manufacture of bricks, tiles and construction products	-1.592
265	Manufacture of cement, lime and plaster	-1.960
183	Dressing and dyeing of fur; manufacture of articles of fur	-2.235
231	Coke oven products	-6.832
The 3 winning and 3 losing sectors (NACE 2-digit)		
32	Radio, television and communication equipment	1.655
30	Office, accounting and computing machinery	1.271
35	Transport equipment	0.945
20	Wood and of wood and cork	-0.570
24	Chemicals and chemical products	-0.579
19	Leather, leather and footwear	-0.719

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
177	Manufacture of knitted and crocheted articles	4.693
265	Manufacture of cement, lime and plaster	2.972
182	Manufacture of other wearing apparel and accessories	2.157
365	Manufacture of games and toys	2.081
171	Preparation and spinning of textile fibres	2.017
275	Casting of metals	-2.118
183	Dressing and dyeing of fur; manufacture of articles of fur	-3.658
23	Manufacture of coke, refined petroleum products and nuclear fuel	-4.333
16	Manufacture of tobacco products	-6.063
296	Manufacture of weapons and ammunition	-14.247
The 3 winning and 3 losing sectors (NACE 2-digit)		
37	Recycling	2.904
18	Wearing apparel, dressing and dyeing of fur	1.652
26	Non-metallic mineral products	1.081
61	Water transport	-1.670
16	Tobacco products	-1.987
41	Water supply	-2.357

Source: Eurostat (SBS, Comext).

Table A2.3: Selected Sectors II - Bulgaria

Revealed comparative advantage (RCA)

		RCA (export)			Export shares in price segments					
		2010	Change 1999/2010	Change 2007/2010	2009 in %	Low Change 1999/2009	Change 2007/2009	2009 in %	High Change 1999/2009	Change 2007/2009
Top-5 industries (NACE 3-digit)						in percentage points			in percentage points	
171	Preparation and spinning of textile fibres	1.825	1.783	-0.230	38.846	-51.465	4.115	15.735	14.625	-13.640
274	Manufacture of basic precious and non-ferrous metals	1.658	0.230	-0.018	27.639	-22.075	1.848	9.540	8.832	5.250
314	Manufacture of accumulators, primary cells and primary batteries	1.515	0.754	0.203	79.125	-13.642	-15.566	3.810	3.810	2.781
182	Manufacture of other wearing apparel and accessories	1.480	-0.445	-0.279	56.587	-31.718	-17.629	7.107	6.444	4.547
156	Manufacture of grain mill products, starches and starch products	1.400	0.827	0.705	88.322	3.236	0.155	1.599	0.768	1.465

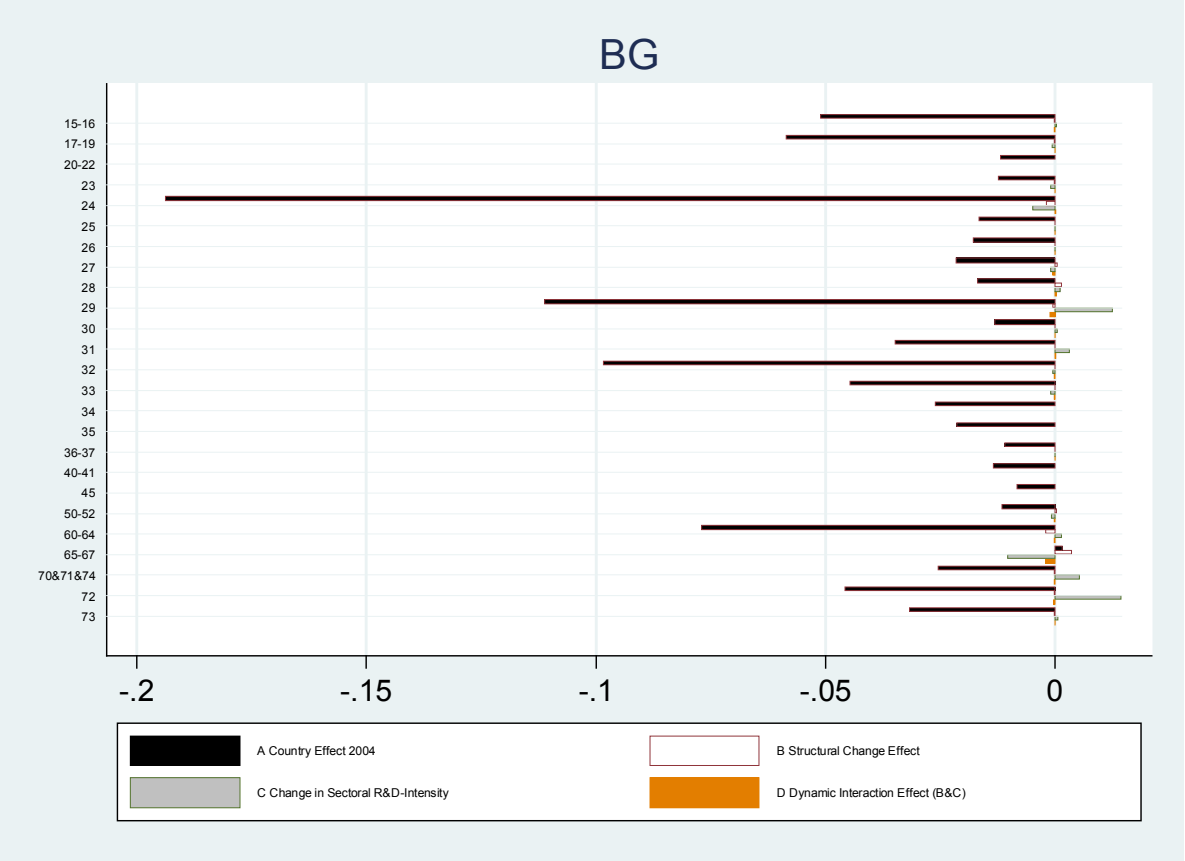
Relative value added (RVA)

		RVA		RCA (export)			Export shares in price segments					
		2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Low Change 1999/2007	Change 2007/2009	2007	High Change 1999/2007	Change 2007/2009
Top-5 industries (NACE 3-digit)								in percentage points			in percentage points	
177	Manufacture of knitted and crocheted articles	6.956	4.751	1.428	0.144	-0.227	97.264	-1.098	-24.805	0.000	0.000	0.438
182	Manufacture of other wearing apparel and accessories	6.484	1.627	1.759	-0.166	-0.279	74.216	-14.088	-17.629	2.559	1.897	4.547
314	Manufacture of accumulators, primary cells and primary batteries	5.594	1.392	1.312	0.552	0.203	94.690	1.924	-15.566	1.029	1.029	2.781
265	Manufacture of cement, lime and plaster	5.571	2.280	0.670	-1.547	-0.413	99.913	7.860	-6.806	0.000	-0.046	0.915
16	Manufacture of tobacco products	4.372	-6.152	-0.024	-1.121	1.147	-	-	-	-	-	-

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext).

Graph A2.3: Sectoral R&D decomposition: Change in structure, R&D intensity and interaction between structure and intensity, NACE-2-digit level



1.3. Czech Republic

Trade and industry specialisation

At the detailed manufacturing industry level, the Czech Republic features industry specialisation in capital-intensive industries (parts and accessories for motor vehicles), mainstream manufacturing (manufacture of rubber products), and labour-intensive industries. At the more aggregated sector level, the Czech Republic is specialised in sectors with high innovation intensity, such as electrical machinery, but also medium-low innovation sectors (such as printing and publishing). Trade specialisation is to some extent different to industry specialisation in terms of being more tilted towards knowledge-intensive sectors, with the Czech Republic specialising in technology-driven industries (such as computers), a defining characteristic of the group of countries with lower income levels and trade specialisation in knowledge-intensive sectors. However, the Czech Republic shows much lower export shares to the BRIC countries than on average in the EU.

Export quality and sectoral R&D performance

The Czech Republic shows R&D intensity below the EU average given its industrial structure. The export quality performance is characterised by low shares in high price and high shares in low price export segments, indicating an unfavourable position on the quality ladder.

Overall, the Czech Republic is a typical member of country group 3, where trade specialisation in knowledge-intensive manufacturing industries and sectors and relatively low R&D activity reflect these countries' position in the international value chain. They are more focused on assembly and production, whereas innovation and R&D are more likely to be done in the group of countries with higher income levels and specialisation in knowledge-intensive sectors (group 1). In contrast, educationally intensive service sectors are underrepresented, as there is less scope for the international division of labour.

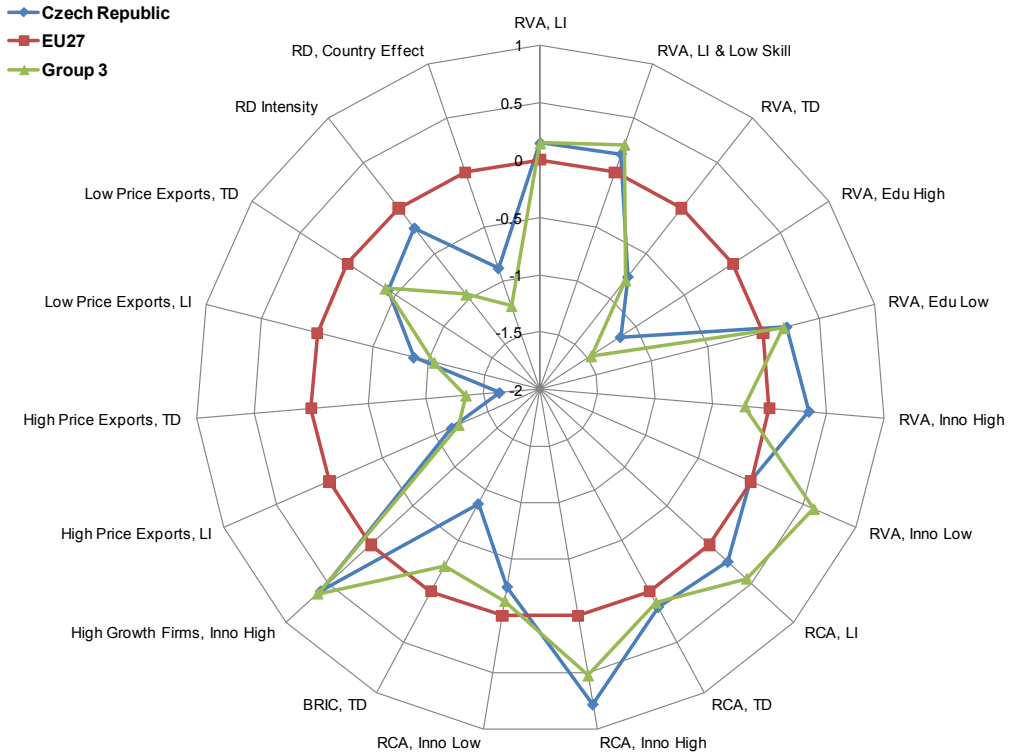
Structural change

In terms of change, the Czech Republic shows similar behaviour to its country group. The relative export and value added shares in labour intensive industries (such as the dressing and dyeing of fur) and low innovation intensity sectors (such as wearing apparel) decreased, while they increased in high innovation and high education sectors (computers, communication equipment) as well as in technology-driven industries (such as the manufacture of radio and TV transmitters and receivers, or computers). The quality ladder and the R&D indicators show strong improvement. Overall, this points to a positive outlook in terms of competitiveness and catching up potential to group 1.

Impact of the crisis

The impact of the crisis on structural change in the Czech Republic was very limited, as no major change in specialisation patterns occurred.

Graph A3.1: Level



Graph A3.2: Change

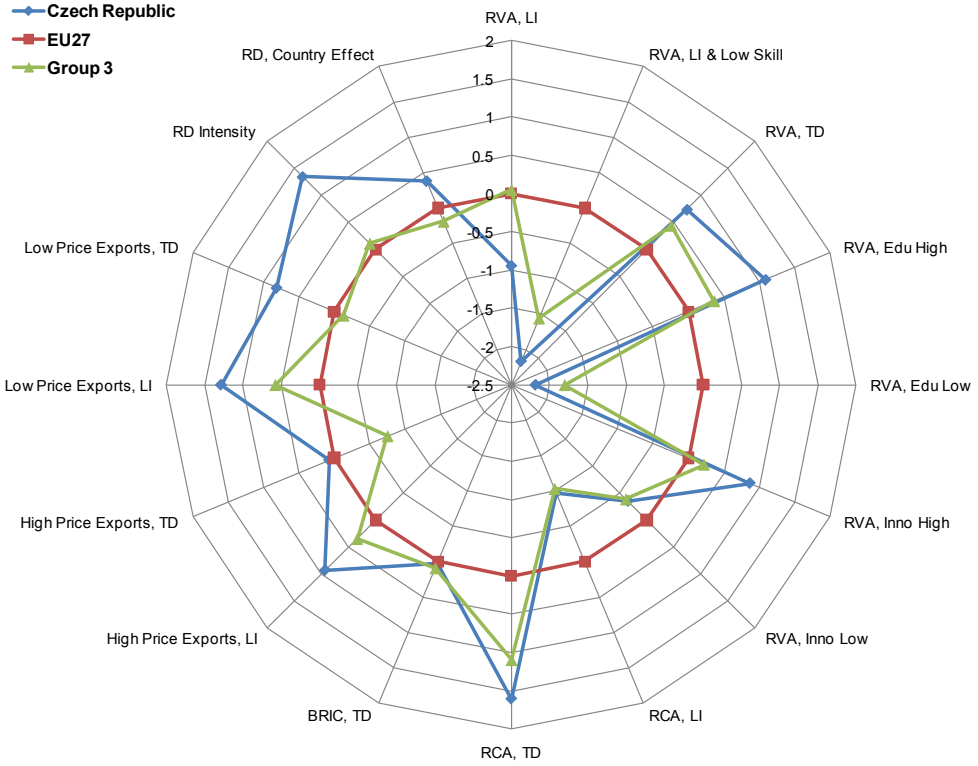


Table A3.1: Summary table - Czech Republic

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2007	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
																Percentage points						
Factor inputs																						
Mainstream industries	0.151	n.a.									0.174	-0.144	-0.061	1.529	0.839	0.154	18.872	51.027				
Labourintensive industries	0.062	n.a.									0.145	-0.358	-0.062	0.575	0.325	0.088	16.758	43.460				
Capital intensive industries	0.313	n.a.									-0.236	-0.312	-0.005	0.848	0.523	0.436	9.413	40.961				
Marketing driven industries	-0.231	n.a.									-0.265	-0.004	0.022	0.328	-0.004	0.087	11.596	58.694				
Technology driven industries	-0.362	n.a.									0.064	0.582	0.087	1.373	0.950	0.242	11.163	41.911				
Skill intensity																						
Low skill industries	0.114	n.a.																				
Medium/blue collar workers	0.258	n.a.																				
Medium/white collar workers	-0.265	n.a.																				
High skill industries	-0.302	n.a.																				
Labour intensive and low skill industries	0.137	n.a.																				
Revealed quality elasticity																						
High RQE	-0.002	n.a.									-0.118	0.031	-0.001	2.340	1.263	0.503	13.732	33.780				
Medium RQE	-0.068	n.a.									0.145	0.198	0.047	1.402	0.856	0.325	11.617	51.055				
Low RQE	0.089	n.a.									0.035	-0.249	-0.049	0.912	0.516	0.179	15.958	60.300				
INNOTYPE											2009	Change 2004/2009	Change 2007/2009									
High	0.127	0.111	10.358	1.278	0.005	0.104	0.313	4	0	+	0.254	0.054	-0.044						0.451	-0.387	0.050	0.039
Med-high	0.320	-0.112	17.877	1.197	0.188	-3.206	0.534	3	-1	0	-0.054	-0.036	0.012						0.401	-0.395	0.024	0.010
Med	-0.150	0.099	18.368	1.535	0.103	-1.807	0.132	2	1	-	-0.034	-0.037	0.049						0.072	-0.028	0.001	0.036
Med-low	0.315	-0.060	10.064	-1.500	0.279	-1.906	-0.464	2	1	-	-0.544	0.057	0.027						0.075	-0.101	-0.002	0.030
Low	-0.001	-0.063	18.749	-0.229	0.301	3.572	0.189	1	-2	+	-0.307	0.107	0.115						0.026	-0.006	0.002	0.003
EDUTYPE																						
High	-0.408	0.255	13.493	1.439	0.005	-3.263	0.045	2	1	-	-0.116	0.305	0.076									
Med-high	-0.339	-0.189	5.641	-0.093	-0.046	-0.228	0.322	5	0	+	-0.488	-0.022	0.034									
Med	0.135	0.091	40.013	0.885	0.500	4.605	0.163	5	0	0	0.388	0.087	0.046									
Med-low	0.100	0.121	14.537	1.267	0.261	-0.302	0.247	2	0	+	0.238	0.023	0.037									
Low	0.041	-0.200	26.316	-3.498	0.124	0.346	-0.104	2	1	-	-0.047	-0.157	-0.053									
Total	0.000	0.000	100.000	0.000	0.188	0.000	0.091	5	0	0	0.000	0.000	0.000	4.654	2.635	1.008	13.708	46.167	1.058	-0.902	0.073	0.119

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A3.2: Selected Sectors I - Czech Republic

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
365	Manufacture of games and toys	1.357
300	Manufacture of office machinery and computers	1.163
231	Coke oven products	1.158
222	Printing and service activities related to printing	1.060
204	Manufacture of wooden containers	1.048
Top-3 sectors (NACE 2-digit)		
30	Office, accounting and computing machinery	1.163
28	Fabricated metal	0.571
22	Printing, publishing and reproduction	0.552

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
343	Manufacture of parts, accessories for motor vehicles	1.159
251	Manufacture of rubber products	0.923
286	Manufacture of cutlery, tools and general hardware	0.848
352	Manufacture of railway, tramway locomotives, rolling stock	0.847
363	Manufacture of musical instruments	0.804
Top-3 sectors (NACE 2-digit)		
34	Motor vehicles, trailers and semi-trailers	0.804
25	Rubber and plastics	0.736
40	Electricity and gas	0.723

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	2.721
300	Manufacture of office machinery and computers	2.652
323	Manuf. of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	1.540
365	Manufacture of games and toys	1.300
152	Processing and preserving of fish and fish products	1.200
183	Dressing and dyeing of fur; manufacture of articles of fur	-1.286
351	Building and repairing of ships and boats	-1.287
265	Manufacture of cement, lime and plaster	-1.366
363	Manufacture of musical instruments	-1.612
233	Nuclear fuel	-1.957
The 3 winning and 3 losing sectors (NACE 2-digit)		
30	Office, accounting and computing machinery	2.652
32	Radio, television and communication equipment	1.143
34	Motor vehicles, trailers and semi-trailers	0.267
18	Wearing apparel, dressing and dyeing of fur	-0.710
35	Transport equipment	-0.907
23	Coke, refined petroleum and nuclear fuel	-0.913

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
343	Manufacture of parts, accessories for motor vehicles	1.499
251	Manufacture of rubber products	0.948
365	Manufacture of games and toys	0.832
333	Manufacture of industrial process control equipment	0.487
252	Manufacture of plastic products	0.457
172	Textile weaving	-1.272
183	Dressing and dyeing of fur; manufacture of articles of fur	-1.273
352	Manufacture of railway, tramway locomotives, rolling stock	-1.280
154	Manufacture of vegetable and animal oils and fats	-1.508
363	Manufacture of musical instruments	-3.866
The 3 winning and 3 losing sectors (NACE 2-digit)		
25	Rubber and plastics	0.834
62	Air transport	0.731
34	Motor vehicles, trailers and semi-trailers	0.718
18	Wearing apparel, dressing and dyeing of fur	-1.086
23	Coke, refined petroleum and nuclear fuel	-1.158
37	Recycling	-1.294

Source: Eurostat (SBS, Comext).

Table A3.3: Selected Sectors II - Czech Republic

Revealed comparative advantage (RCA)

		RCA (export)			Export shares in price segments					
		2010	Change 1999/2010	Change 2007/2010	2009 in %	Low Change 1999/2009	Change 2007/2009	2009 in %	High Change 1999/2009	Change 2007/2009
Top-5 industries (NACE 3-digit)						in percentage points			in percentage points	
365	Manufacture of games and toys	1.357	1.300	0.308	20.708	-44.213	5.719	21.616	9.779	8.905
300	Manufacture of office machinery and computers	1.163	2.652	0.300	54.562	-16.642	4.890	3.226	-14.024	-17.694
231	Coke oven products	1.158	-0.989	0.050	50.896	-47.179	20.122	0.341	0.341	-2.347
222	Printing and service activities related to printing	1.060	-0.064	-0.195	96.381	0.513	7.334	2.795	2.365	-6.715
204	Manufacture of wooden containers	1.048	-0.462	-0.018	90.830	-6.602	3.640	0.324	0.199	-2.096

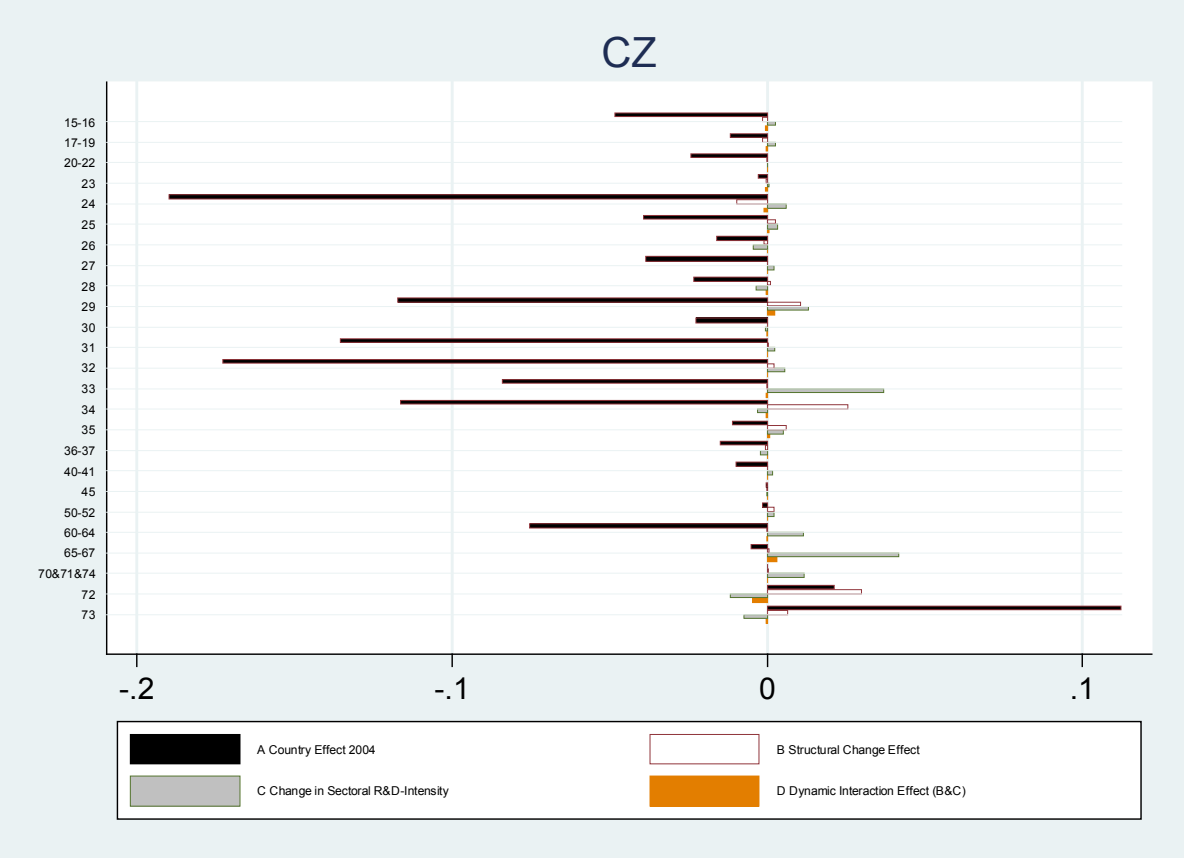
Relative value added (RVA)

		RVA		RCA (export)			Export shares in price segments				
		2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Low Change 1999/2007	Change 2007/2009	2007	High Change 1999/2007	Change 2007/2009
Top-5 industries (NACE 3-digit)								in percentage points			in percentage points	
343	Manufacture of parts, accessories for motor vehicles	3.187	1.248	0.743	0.198	0.033	58.029	-29.906	-33.011	1.645	-1.014	-0.415
251	Manufacture of rubber products	2.517	0.706	0.823	0.073	-0.067	63.093	-16.178	-23.055	8.152	3.885	18.287
286	Manufacture of cutlery, tools and general hardware	2.336	0.430	0.278	0.079	0.177	45.709	-40.023	1.359	10.134	7.854	0.610
352	Manufacture of railway, tramway locomotives, rolling stock	2.333	-1.458	1.097	-0.658	-0.389	79.778	11.919	-6.475	12.608	7.674	-4.575
363	Manufacture of musical instruments	2.236	-3.851	0.356	-1.303	-0.310	41.815	-19.786	16.562	11.132	3.687	-0.900

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext).

Graph A3.3: Sectoral R&D decomposition: Change in structure, R&D intensity and interaction between structure and intensity, NACE-2-digit level



1.4. Denmark

Trade and industry specialisation

At the detailed level of manufacturing industries, Denmark is specialised in mainstream manufacturing industries (electric motors, generators and transformers) and in marketing-driven industries (the manufacture of games and toys, or meat and fish products). In addition, in exports Denmark is also specialised in labour-intensive industries (the manufacture of builders' carpentry and joinery). At the more aggregated sector level, Denmark features value added specialisation in sectors with high innovation intensity (machinery), and with low innovation intensity (water transport). In exports, Denmark is strongly specialised in sectors with low innovation and medium-low education intensity (again, water transport). Overall, Denmark's specialisation profile is strongly driven both by intangible assets (marketing-driven industries such as games and toys), but at the same time by natural endowments (agricultural products, sea, etc.), explaining its bipolar specialisation in both innovative and less innovative sectors. However, Denmark's export shares to BRIC countries are very low, indicating unused potential to exploit growth opportunities. However, Denmark shows an above average share of high growth firms in highly innovative sectors, pointing to strong business dynamism.

Export quality and sectoral R&D performance

Denmark's business R&D investments are above the expected level given its industrial structure. Above average quality indicators (with the exception of the high price segment in labour-intensive industries) indicate a favourable position on the quality ladder. This explains how Denmark manages to sustain competitiveness in sectors characterised by low innovation intensity.

Structural change

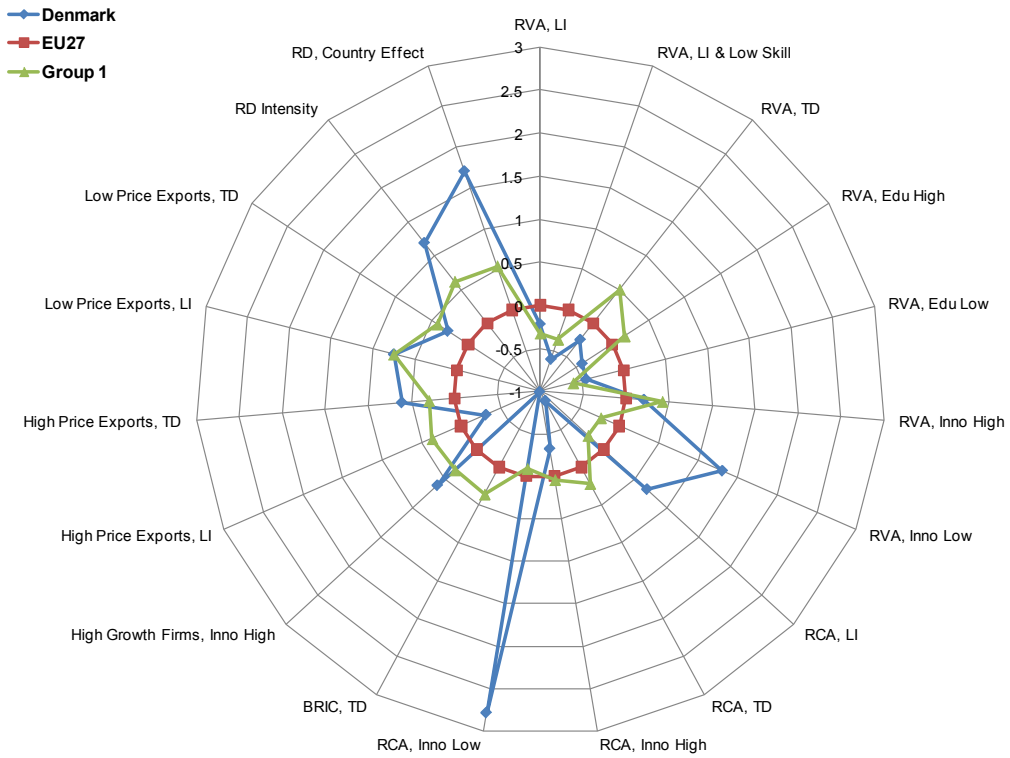
In terms of change, Denmark strongly increased its relative value added shares in technology-driven industries such as in medical equipment as well as in sectors with high educational and innovation intensity (electrical machinery), while substantially reducing its specialisation in sectors with low innovation and education intensity (land and water transport). The change dynamics for exports are somewhat different, with high education sectors increasing strongly (financial services) but high innovation sectors slightly decreasing (communication equipment), as well as technology-driven industries (aircraft and spacecraft). Denmark's sectoral R&D intensity have risen considerably, while there was little change in the quality indicators. At the sectoral level, Denmark has gained R&D intensity mainly in services sectors such as distribution, software and research and development, while decreasing R&D intensity in machinery and transport and communications.

Overall, this points to a mostly unchanged positive outlook for competitiveness.

Impact of the crisis

The impact of the crisis on Denmark's specialisation patterns was limited, with no clear overall direction of change in the crisis years.

Graph A4.1: Level



Graph A4.2: Change

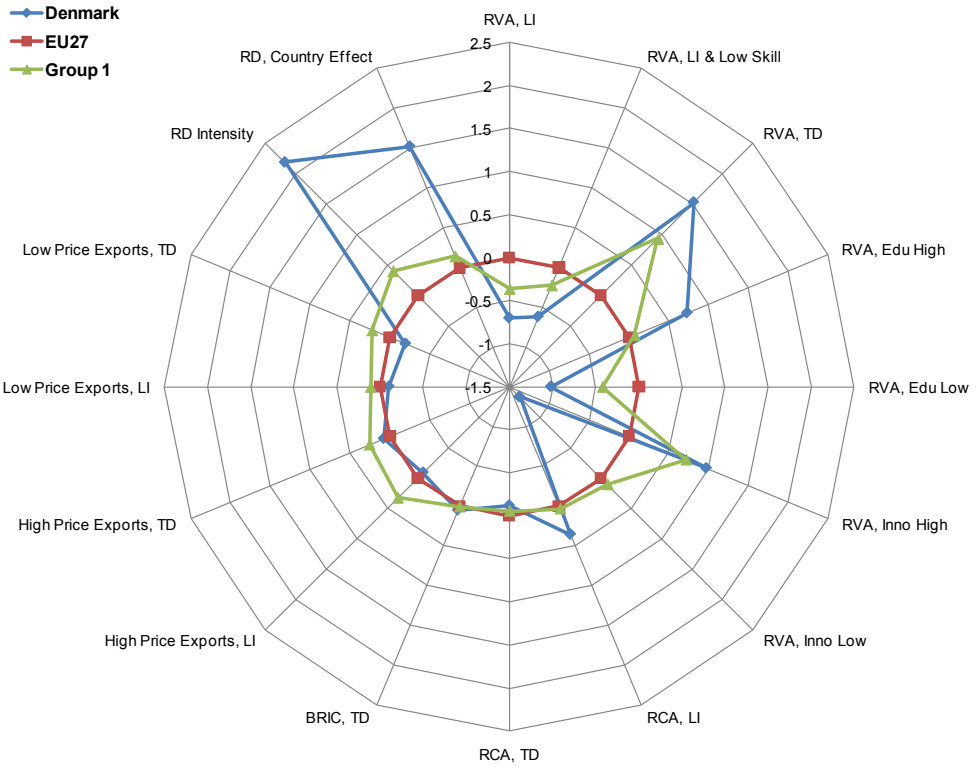


Table A4.1: Summary table - Denmark

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2007	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
Factor inputs																						
Mainstream industries	0.315	0.086									0.283	0.093	0.034	2.094	1.443	0.477	37.558	15.546				
Labourintensive industries	-0.102	-0.083									0.400	0.132	0.123	0.283	0.175	-0.028	30.890	20.139				
Capital intensive industries	-1.274	-0.020									-0.679	0.128	-0.034	0.425	0.308	-0.040	19.035	31.518				
Marketing driven industries	0.201	-0.122									0.671	-0.045	0.000	1.234	0.698	0.183	29.053	28.129				
Technology driven industries	-0.102	0.175									-0.460	-0.054	-0.090	1.233	0.894	0.498	59.488	10.552				
Skill intensity																						
Low skill industries	0.020	-0.095																				
Medium/blue collar workers	-0.217	-0.065																				
Medium/white collar workers	-0.064	0.100																				
High skill industries	0.298	0.061																				
Labour intensive and low skill industries	-0.751	-0.242																				
Revealed quality elasticity																						
High RQE	-0.058	0.072									-0.157	0.031	-0.009	2.345	1.536	0.628	45.822	14.723				
Medium RQE	0.104	-0.065									0.364	-0.023	0.023	1.895	1.248	0.370	28.960	25.170				
Low RQE	-0.073	0.021									-0.208	0.009	-0.033	1.028	0.734	0.090	34.413	20.438				
											2009	Change 2005/2009	Change 2007/2009									
INNOTYPE																						
High	0.078	0.133	9.650	1.139	0.371	0.229	0.324	3	0	0	-0.127	-0.015	0.019						1.031	0.424	0.078	0.264
Med-high	-0.398	-0.095	8.824	-1.509	0.154	2.309	-0.125	3	-1	0	-0.601	0.015	0.065						0.553	0.189	-0.060	-0.012
Med	-0.151	0.011	19.835	1.711	0.379	0.195	0.119	4	0	0	-0.223	0.040	0.025						0.237	0.166	0.004	0.020
Med-low	-0.116	-0.262	9.296	-1.656	-0.322	-3.346	-0.167	3	0	0	0.545	-0.168	-0.068						0.232	0.085	-0.021	-0.070
Low	0.235	-0.180	18.143	-0.632	0.131	-0.764	-0.018	2	0	0	1.355	-0.009	-0.122						0.200	0.149	0.001	0.169
EDUTYPE																						
High	-0.128	0.123	18.390	3.154	0.412	0.017	0.183	4	-1	0	-0.332	0.225	0.193									
Med-high	-0.193	-0.024	6.893	-0.505	0.306	3.343	0.029	3	-1	+	-0.315	-0.101	-0.040									
Med	0.099	0.089	38.987	-2.653	0.153	-0.796	0.048	4	0	0	-0.407	0.068	0.072									
Med-low	0.132	-0.110	14.072	0.494	0.201	-1.087	-0.192	2	0	0	1.143	-0.047	-0.116									
Low	-0.095	-0.111	21.658	-0.490	0.201	0.492	-0.053	3	1	-	0.063	-0.010	0.047									
Total	0.000	0.000	100.000	0.000	0.243	0.000	0.020	4	0	0	0.000	0.000	0.000	5.268	3.518	1.089	36.615	20.120	2.257	1.002	0.002	0.366

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A4.2: Selected Sectors I - Denmark

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
152	Processing and preserving of fish and fish products	2.260
151	Production, processing, preserving of meat, meat products	1.677
203	Manufacture of builders' carpentry and joinery	1.244
155	Manufacture of dairy products	1.193
311	Manufacture of electric motors, generators and transformers	1.182
Top-3 sectors (NACE 2-digit)		
15	Food and beverages	1.024
18	Wearing apparel, dressing and dying of fur	0.744
36	Furniture, jewellery, musical instruments, sports goods, games and toys	0.490

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
365	Manufacture of games and toys	2.043
311	Manufacture of electric motors, generators and transformers	1.371
152	Processing and preserving of fish and fish products	1.247
268	Manufacture of other non-metallic mineral products	1.200
155	Manufacture of dairy products	0.856
Top-3 sectors (NACE 2-digit)		
61	Water transport	1.827
70	Real estate activities	0.794
16	Tobacco products	0.412

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
362	Manufacture of jewellery and related articles	2.526
296	Manufacture of weapons and ammunition	1.751
261	Manufacture of glass and glass products	0.639
181	Manufacture of leather clothes	0.622
233	Nuclear fuel	0.597
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	-0.864
176	Manufacture of knitted and crocheted fabrics	-0.994
355	Manufacture of other transport equipment n.e.c.	-1.084
247	Manufacture of man-made fibres	-1.168
353	Manufacture of aircraft and spacecraft	-1.458
The 3 winning and 3 losing sectors (NACE 2-digit)		
30	Office, accounting and computing machinery	0.450
18	Wearing apparel, dressing and dyeing of fur	0.404
19	Leather, leather products and footwear	0.398
20	Wood and products of wood and cork	-0.454
35	Transport equipment	-0.469
32	Radio, television and communication equipment	-0.589

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
365	Manufacture of games and toys	3.080
311	Manufacture of electric motors, generators and transformers	2.116
268	Manufacture of other non-metallic mineral products	1.476
157	Manufacture of prepared animal feeds	1.225
191	Tanning and dressing of leather	0.939
242	Manufacture of pesticis and other agro-chemical products	-0.998
342	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers	-1.038
152	Processing and preserving of fish and fish products	-1.285
351	Building and repairing of ships and boats	-1.474
355	Manufacture of other transport equipment n.e.c.	-1.920
The 3 winning and 3 losing sectors (NACE 2-digit)		
70	Real estate activities	1.316
31	Electrical machinery and apparatus, nec	0.569
16	Tobacco products	0.529
63	Supporting and auxiliary transport activities; activities of travel agencies	-0.373
60	Inland transport	-0.602
61	Water transport	-0.765

Source: Eurostat (SBS, Comext).

Table A4.3: Selected Sectors II - Denmark

Revealed comparative advantage (RCA)

	RCA (export)			Export shares in price segments					
	2010	Change 1999/2010	Change 2007/2010	2009 in %	Low Change 1999/2009	Change 2007/2009	2009 in %	High Change 1999/2009	Change 2007/2009
Top-5 industries (NACE 3-digit)					in percentage points			in percentage points	
152 Processing and preserving of fish and fish products	2.260	-0.175	0.023	24.788	8.610	5.197	16.194	-21.037	-12.337
151 Production, processing, preserving of meat, meat products	1.677	-0.189	-0.050	31.658	15.521	5.370	34.548	-5.540	-6.824
203 Manufacture of builders' carpentry and joinery	1.244	-0.516	-0.228	4.903	1.544	-1.264	36.584	-12.941	3.031
155 Manufacture of dairy products	1.193	-0.002	0.149	26.140	24.014	9.258	21.331	-20.590	0.779
311 Manufacture of electric motors, generators and transformers	1.182	0.115	-0.119	9.361	-42.027	-31.855	23.336	2.153	10.110

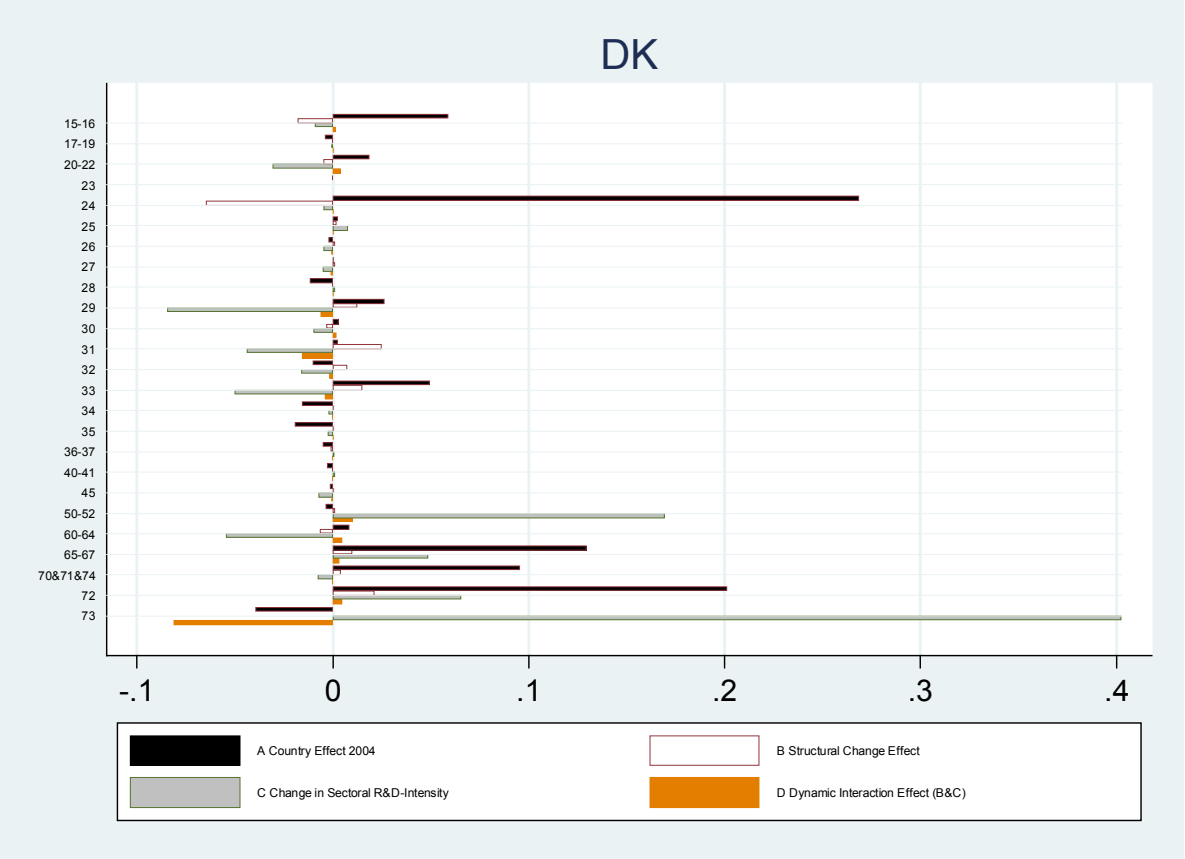
Relative value added (RVA)

	RVA		RCA (export)			Export shares in price segments				
	2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Low Change 1999/2007	Change 2007/2009	2007	High Change 1999/2007	Change 2007/2009
Top-5 industries (NACE 3-digit)							in percentage points			in percentage points	
365 Manufacture of games and toys	7.710	2.848	0.230	0.630	-0.246	3.387	-3.741	-0.479	28.773	-4.876	-12.954
311 Manufacture of electric motors, generators and transformers	3.938	2.118	1.301	0.234	-0.119	41.216	-10.173	-31.855	13.226	-7.957	10.110
152 Processing and preserving of fish and fish products	3.480	-1.284	2.236	-0.198	0.023	19.592	3.413	5.197	28.531	-8.700	-12.337
268 Manufacture of other non-metallic mineral products	3.322	1.175	-0.452	-0.066	-0.332	53.108	8.938	-10.961	27.580	-14.109	18.117
155 Manufacture of dairy products	2.353	0.122	1.044	-0.151	0.149	16.882	14.757	9.258	20.551	-21.369	0.779

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext).

Graph A4.3: Sectoral R&D decomposition: Change in structure, R&D intensity and interaction between structure and intensity, NACE-2-digit level



1.5. Germany

Trade and industry specialisation

At the detailed level of manufacturing industries, Germany is strongly specialised in technology-driven industries (manufacture of motor vehicles, electricity distribution and control apparatus), and less so in mainstream manufacturing, e.g. in the manufacture of transport equipment. In capital-intensive industries (e.g. the manufacture of parts and accessories for motor vehicles), Germany features value added but not export specialisation. The only labour-intensive industry in the top 5 industries is a high skill industry (machine-tools). At the more aggregated sector level, Germany features specialisation in high and medium-high innovation intensive sectors (motor vehicles, electrical machinery and medical, precision and optical instruments). However, Germany is not specialised in sectors with high educational intensity, because of relatively low shares in financial services and software. The share of exports by technology-driven industries going to the BRIC countries is very high, indicating further growth potential for Germany.

Export quality and sectoral R&D performance

Germany's export shares in technology-driven and labour-intensive industries are extremely low in the low price segments, and in line with the average of the higher income, knowledge-intensive countries in the high price segments, indicating a strong position on the quality ladder. The R&D country effect is slightly negative, i.e. Germany's business R&D investments are below the expected level given its industrial structure.

Structural change

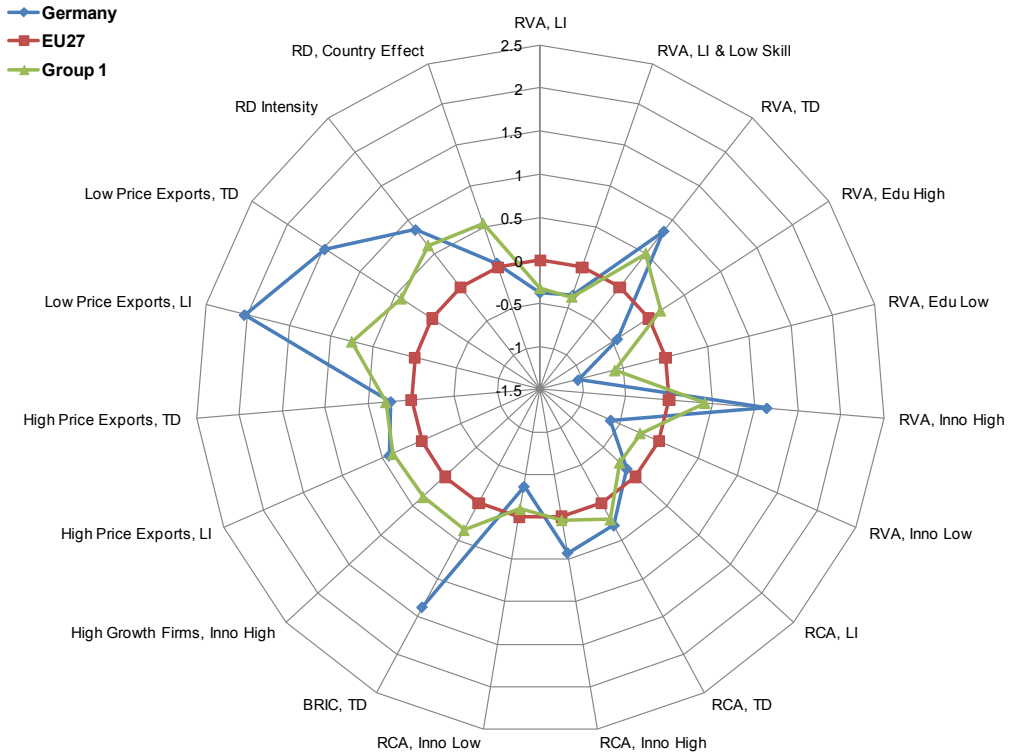
In terms of change, Germany further increased its value added specialisation in technology-driven industries and highly innovation-intensive sectors, e.g. in computers and electronic components. In exports, technology-driven industries stayed stable, while highly innovation-intensive sectors lost relative shares (radio, TV and communication equipment). Interestingly, Germany also considerably increased its relative share in low innovation sectors, due to a mix of several sectors (recycling, wholesale trade, water transport...). Germany's shares in the high quality segments of technology-driven industries decreased, as did its sectoral R&D intensity (R&D country effect) and its relative value added share of educationally highly intensive sectors. At the sectoral level of R&D intensity, Germany's R&D intensity decreased noticeably in motor vehicles, transport equipment, pharmaceuticals and communication equipment, while other sectors saw little increases (e.g. machinery).

Overall, Germany faces a favourable competitive position, which it could however strengthen even further by boosting sectoral R&D intensity.

Impact of the crisis

The impact of the crisis on Germany's specialisation patterns was limited overall, with technology-driven industries declining as compared with before the crisis.

Graph A5.1: Level



Graph A5.2: Change

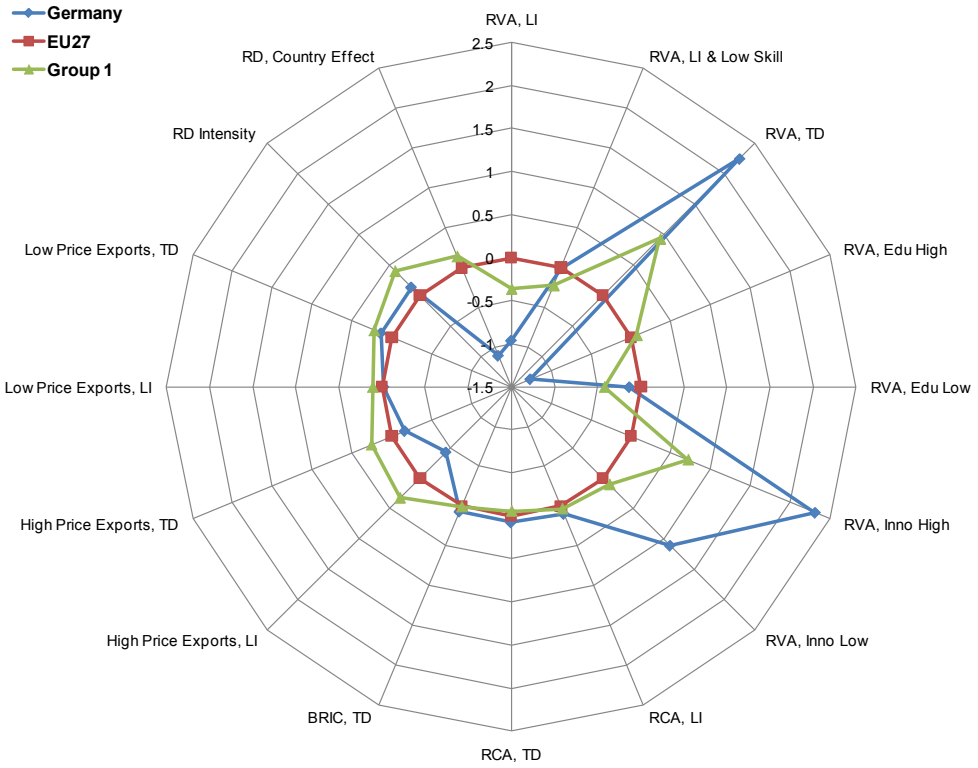


Table A5.1: Summary table - Germany

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2007	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
Factor inputs																						
Mainstream industries	0.075	-0.032									0.161	0.002	0.037	3.631	2.417	0.843	41.209	12.249				
Labourintensive industries	-0.178	-0.120									-0.103	0.056	0.016	0.878	0.501	0.171	43.030	14.112				
Capital intensive industries	0.028	0.063									-0.198	-0.065	0.002	1.771	1.317	0.667	20.148	27.999				
Marketing driven industries	-0.351	-0.160									-0.273	0.055	-0.002	0.551	0.259	0.124	23.748	30.633				
Technology driven industries	0.287	0.174									0.118	0.019	-0.025	3.938	2.913	1.388	51.538	4.603				
Skill intensity																						
Low skill industries	-0.308	-0.102																				
Medium/blue collar workers	0.130	-0.032																				
Medium/white collar workers	0.033	0.040																				
High skill industries	0.175	0.087																				
Labour intensive and low skill industries	-0.354	-0.003																				
Revealed quality elasticity																						
High RQE	0.197	0.095									0.135	-0.008	-0.012	6.819	4.891	2.227	48.905	9.846				
Medium RQE	-0.120	-0.049									-0.134	0.027	-0.023	2.008	1.266	0.458	32.093	16.381				
Low RQE	-0.167	-0.107									-0.134	0.008	0.051	1.942	1.250	0.508	25.367	22.889				
											2009	Change 2004/2009	Change 2007/2009									
INNOTYPE																						
High	0.369	0.249	12.086	1.366	0.046	1.165	n.a.	1	-2	0	0.146	-0.032	-0.021						0.721	-0.283	0.069	-0.020
Med-high	0.235	0.285	15.156	1.023	0.060	2.134	n.a.	2	0	0	0.075	-0.002	0.003						1.088	0.159	0.097	-0.105
Med	-0.059	-0.111	20.973	-0.403	0.079	-0.237	n.a.	4	3	-	-0.188	0.071	0.050						0.055	-0.021	0.001	0.005
Med-low	-0.063	0.128	7.331	-1.109	-0.008	4.803	n.a.	4	2	-	-0.292	0.070	0.019						0.093	-0.052	-0.001	0.021
Low	-0.132	0.269	11.631	0.190	0.089	0.297	n.a.	5	0	0	-0.458	0.109	0.062						0.009	-0.011	0.000	0.005
EDUTYPE																						
High	-0.133	-0.181	18.677	0.188	0.123	-0.569	n.a.	5	1	0	-0.300	0.053	0.086									
Med-high	0.223	0.406	8.366	0.566	0.075	1.788	n.a.	2	-1	0	-0.040	-0.003	0.009									
Med	0.185	-0.023	45.276	2.351	-0.014	0.100	n.a.	2	-1	0	0.352	-0.016	-0.005									
Med-low	-0.108	0.168	9.526	-0.743	0.113	0.508	n.a.	5	0	0	-0.105	0.057	0.050									
Low	-0.237	-0.017	18.155	-2.362	-0.015	-0.508	n.a.	4	0	0	-0.206	0.063	0.011									
Total	0.000	0.000	100.000	0.000	0.047	0.000	n.a.	3	0	0	0.000	0.000	0.000	10.768	7.407	3.193	39.518	14.396	1.973	-0.212	0.165	-0.092

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A5.2: Selected Sectors I - Germany

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
294	Manufacture of machine-tools	0.473
355	Manufacture of other transport equipment n.e.c.	0.464
341	Manufacture of motor vehicles	0.459
312	Manufacture of electricity distribution and control apparatus	0.454
332	Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes	0.450
Top-3 sectors (NACE 2-digit)		
34	Motor vehicles, trailers and semi-trailers	0.411
29	Machinery, nec	0.278
33	Medical, precision and optical instruments	0.277

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
312	Manufacture of electricity distribution and control apparatus	0.727
294	Manufacture of machine-tools	0.659
341	Manufacture of motor vehicles	0.618
363	Manufacture of musical instruments	0.547
343	Manufacture of parts, accessories for motor vehicles	0.512
Top-3 sectors (NACE 2-digit)		
34	Motor vehicles, trailers and semi-trailers	0.850
30	Office, accounting and computing machinery	0.732
31	Electrical machinery and apparatus	0.619

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
264	Manufacture of bricks, tiles and construction products	0.739
267	Cutting, shaping and finishing of stone	0.543
177	Manufacture of knitted and crocheted articles	0.469
201	Sawmilling and planing of wood, impregnation of wood	0.451
352	Manufacture of railway, tramway locomotives, rolling stock	0.406
231	Coke oven products	-0.389
154	Manufacture of vegetable and animal oils and fats	-0.408
232	Refined petroleum products	-0.408
183	Dressing and dyeing of fur; manufacture of articles of fur	-0.416
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	-0.478
The 3 winning and 3 losing sectors (NACE 2-digit)		
30	Office, accounting and computing machinery	0.326
20	Wood and products of wood and cork	0.240
16	Tobacco products	0.235
32	Radio, television and communication equipment	-0.066
27	Basic metals	-0.096
23	Coke, refined petroleum and nuclear fuel	-0.402

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
242	Manufacture of pesticides and other agro-chemical products	0.862
30	Manufacture of office machinery and computers	0.689
321	Manufacture of electronic valves and tubes and other electronic components	0.400
343	Manufacture of parts, accessories for motor vehicles	0.292
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	0.291
264	Manufacture of bricks, tiles and construction products	-0.342
281	Manufacture of structural metal products	-0.439
266	Manufacture of articles of concrete, plaster, cement	-0.491
267	Cutting, shaping and finishing of stone	-0.495
203	Manufacture of builders' carpentry and joinery	-0.594
The 3 winning and 3 losing sectors (NACE 2-digit)		
30	Office, accounting and computing machinery	1.199
34	Motor vehicles, trailers and semi-trailers	0.871
32	Radio, television and communication equipment	0.592
71	Renting of machinery and equipment	-0.411
62	Air transport	-1.010
70	Real estate activities	-1.046

Source: Eurostat (SBS, Comext).

Table A5.3: Selected Sectors II - Germany

Revealed comparative advantage (RCA)

		RCA (export)			Export shares in price segments					
		2010	Change 1999/2010	Change 2007/2010	2009 in %	Low Change 1999/2009	Low Change 2007/2009	2009 in %	High Change 1999/2009	High Change 2007/2009
Top-5 industries (NACE 3-digit)						in percentage points			in percentage points	
294	Manufacture of machine-tools	0.473	-0.006	-0.001	2.367	1.041	-0.415	68.456	-7.822	6.488
355	Manufacture of other transport equipment n.e.c.	0.464	0.266	-0.014	11.240	5.678	-7.996	5.954	-18.426	0.042
341	Manufacture of motor vehicles	0.459	0.008	0.064	0.644	-7.210	-0.630	58.514	0.156	-22.131
312	Manufacture of electricity distribution and control apparatus	0.454	-0.017	0.012	1.746	-0.197	-0.659	62.436	3.040	0.530
332	Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes	0.450	0.054	0.030	2.460	-1.169	0.109	55.631	2.303	11.620

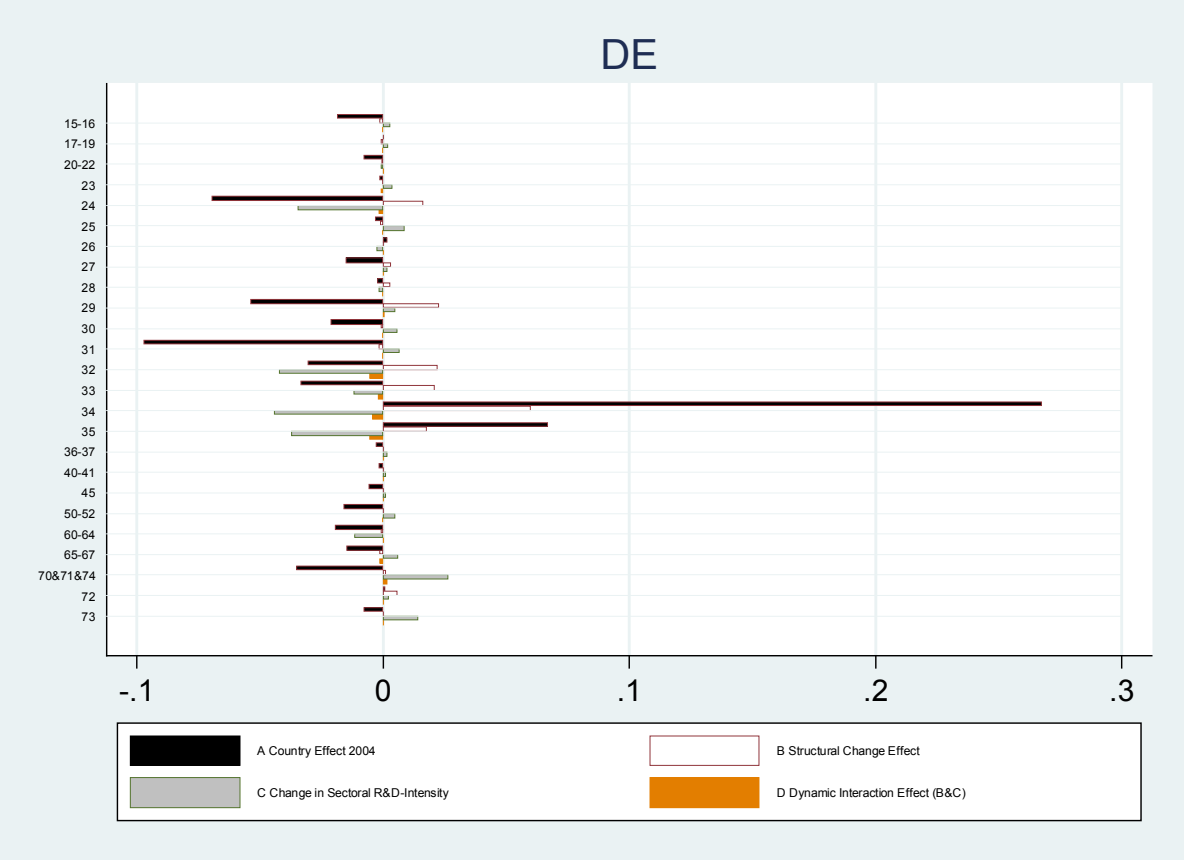
Relative value added (RVA)

		RVA		RCA (export)			Export shares in price segments					
		2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Low Change 1999/2007	Low Change 2007/2009	2007	High Change 1999/2007	High Change 2007/2009
Top-5 industries (NACE 3-digit)								in percentage points			in percentage points	
312	Manufacture of electricity distribution and control apparatus	2.069	-0.046	0.442	-0.029	0.012	2.406	0.462	-0.659	61.906	2.510	0.530
294	Manufacture of machine-tools	1.933	0.223	0.474	-0.005	-0.001	2.782	1.456	-0.415	61.969	-14.309	6.488
341	Manufacture of motor vehicles	1.856	0.264	0.395	-0.056	0.064	1.274	-6.580	-0.630	80.645	22.288	-22.131
363	Manufacture of musical instruments	1.729	0.016	0.194	-0.165	0.103	9.174	6.728	1.466	56.495	-14.260	-5.276
343	Manufacture of parts, accessories for motor vehicles	1.669	0.161	0.273	0.107	0.033	33.944	-3.009	-4.163	4.959	-5.466	13.699

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext).

Graph A5.3: Sectoral R&D decomposition: Change in structure, R&D intensity and interaction between structure and intensity, NACE-2-digit level



1.6. Estonia

Trade and industry specialisation

At the detailed manufacturing industry level, Estonia is highly specialised in labour-intensive industries, such as the running of sawmills and the planing of wood, builders' carpentry and joinery and the manufacture of made-up textile articles. In addition, at an export level, Estonia features (weak) specialisation in capital-intensive industries, such as in refined petroleum products. At the more aggregated sector level, Estonia is highly specialised in low innovation and education sectors, such as wearing apparel and auxiliary transport activities, while Estonia's top sector, wood and products of wood, is of medium innovation intensity. Like the other Baltic States and Finland, Estonia exports a lot to Russia, hence its high share in exports to the BRIC countries. The high share of high growth enterprises in the population of active enterprises indicates that Estonia is catching up.

Export quality and sectoral R&D performance

The shares in low price segments of exports are above the EU average, while the shares in high price segments are below the EU average, indicating an unfavourable position on the quality ladder. Overall, Estonia is a typical member of the group of countries featuring relatively lower income levels and specialisation in labour-intensive industries. The exception is its higher R&D intensity. Even though Estonia's R&D intensity is below average given its industrial structure, it is much higher on average than the rest of its country group.

Structural change

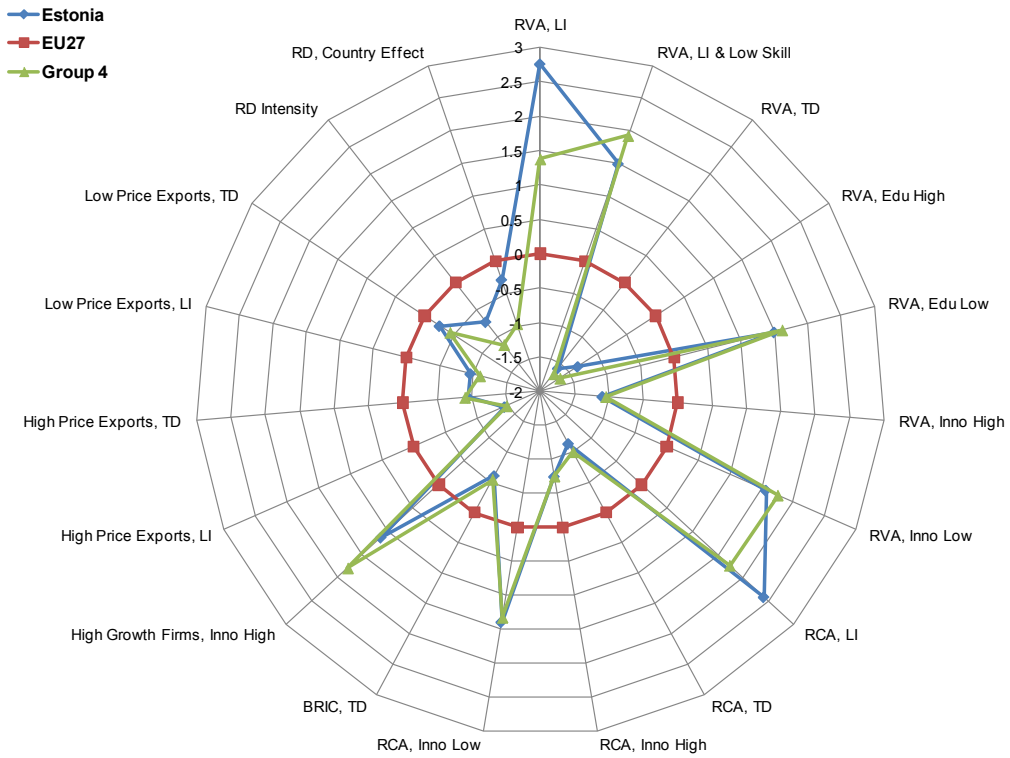
In terms of change, Estonia increased industry specialisation in highly innovation-intensive industries and high education sectors such as electrical machinery while it decreased trade specialisation in labour intensive (textile weaving) and technology-driven industries (aircraft and spacecraft). At the same time, it increased mainstream manufacturing (manufacture of electric motors) and capital-intensive industries (refined petroleum products, man-made fibres). Estonia substantially increased its sectoral R&D intensity (mostly in transport and communication and in chemicals), and climbed the quality ladder in labour-intensive industries (but not in technology-driven ones).

Overall, Estonia is catching up with respect to competitiveness and, if it keeps momentum, will upgrade to the group of higher income countries with specialisation in labour-intensive industries (group 2).

Impact of the crisis

In Estonia, the crisis seems to have slowed down overall structural change, as the changes in relative shares were much smaller than over the whole period 1999-2010.

Graph A6.1: Level



Graph A6.2: Change

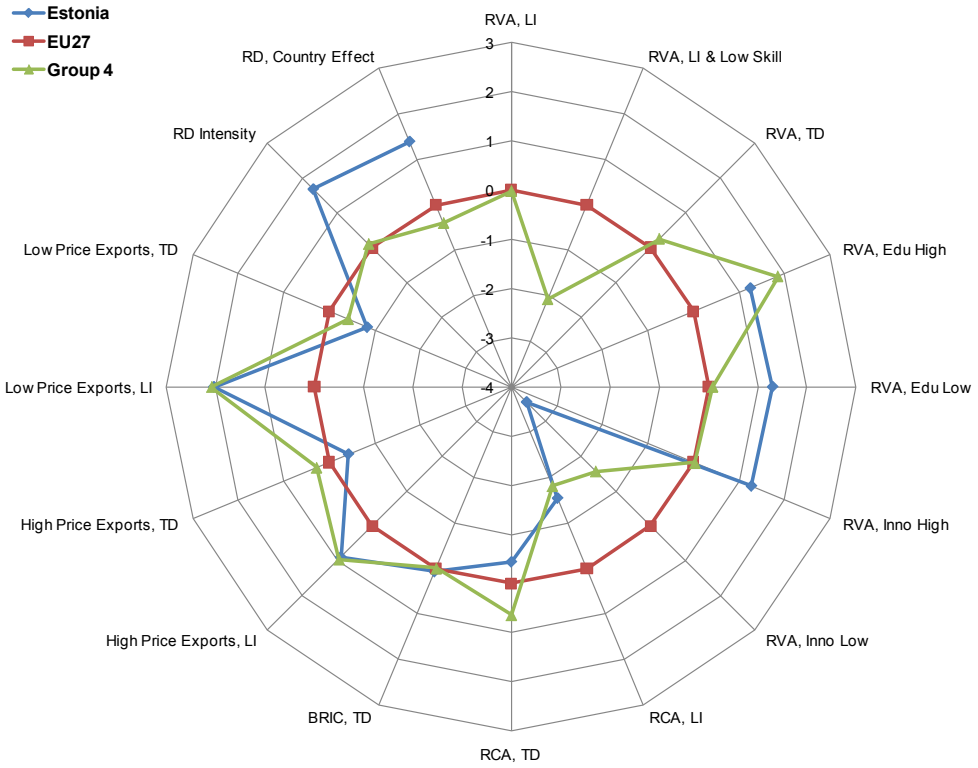


Table A6.1: Summary table - Estonia

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2007	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
																Percentage points						
Factor inputs																						
Mainstream industries	-0.036	n.a.									-0.105	0.398	0.047	4.081	3.716	0.874	18.292	47.561				
Labourintensive industries	0.787	n.a.									1.005	-0.256	0.008	1.540	1.162	0.306	12.022	46.586				
Capital intensive industries	-0.668	n.a.									0.107	0.606	0.038	2.524	0.906	0.199	9.133	36.739				
Marketing driven industries	-0.040	n.a.									0.004	0.057	-0.006	2.848	2.054	0.032	25.351	51.010				
Technology driven industries	-0.998	n.a.									-0.655	-0.221	-0.002	1.672	1.244	0.315	25.945	25.028				
Skill intensity																						
Low skill industries	0.167	n.a.																				
Medium/blue collar workers	0.375	n.a.																				
Medium/white collar workers	-0.168	n.a.																				
High skill industries	-1.242	n.a.																				
Labour intensive and low skill industries	0.833	n.a.																				
Revealed quality elasticity																						
High RQE	-0.413	n.a.									-0.343	-0.025	-0.020	6.711	4.435	0.431	24.305	37.265				
Medium RQE	0.111	n.a.									0.321	0.435	0.064	3.250	2.468	1.324	13.593	34.117				
Low RQE	0.279	n.a.									0.117	-0.386	-0.054	2.703	2.178	-0.029	13.300	57.249				
											2009	Change 2004/2009	Change 2007/2009									
INNOTYPE																						
High	-0.562	0.367	5.223	0.928	0.009	0.635	0.532	2	-2	+	-0.323	-0.206	-0.035						0.278	-0.196	0.023	0.078
Med-high	-0.300	-0.175	9.604	-0.775	-0.036	4.437	0.440	5	0	0	-0.224	0.314	0.029						0.082	-0.185	0.012	-0.010
Med	-0.072	0.189	19.177	1.943	0.087	-0.520	0.067	1	-4	+	0.300	-0.070	-0.034						0.068	-0.031	0.004	0.008
Med-low	0.069	-0.362	8.154	-2.319	-0.207	-11.397	0.369	4	-1	+	-0.003	0.061	-0.094						0.138	-0.054	-0.008	0.085
Low	0.277	-0.409	20.424	-3.309	0.575	-9.151	0.207	1	0	0	0.891	-0.235	0.036						0.019	-0.014	0.000	0.010
EDUTYPE																						
High	-0.488	0.329	13.671	1.459	0.114	0.569	-0.087	1	-2	+	-0.565	0.532	0.077									
Med-high	-0.617	0.479	4.182	0.045	-0.079	2.463	0.497	5	0	+	-0.289	-0.091	-0.023									
Med	0.034	-0.087	40.713	-2.616	0.524	-6.607	0.265	1	0	0	-0.245	0.448	0.036									
Med-low	0.043	-0.239	13.332	-1.867	-0.228	1.768	0.485	3	1	0	0.713	-0.113	0.058									
Low	0.265	0.111	28.104	2.978	0.154	5.569	0.262	5	0	0	0.317	-0.160	-0.032									
Total	0.000	0.000	100.000	0.000	0.244	0.000	0.274	1	0	0	0.000	0.000	0.000	12.664	9.081	1.726	16.412	41.807	0.627	-0.463	0.039	0.176

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A6.2: Selected Sectors I - Estonia

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
203	Manufacture of builders' carpentry and joinery	3.120
201	Sawmilling and planing of wood, impregnation of wood	2.384
174	Manufacture of made-up textile articles, except apparel	2.067
355	Manufacture of other transport equipment n.e.c.	1.978
183	Dressing and dyeing of fur; manufacture of articles of fur	1.831
Top-3 sectors (NACE 2-digit)		
20	Wood and of wood and cork	2.329
23	Coke, refined petroleum and nuclear fuel	1.088
31	Electrical machinery and apparatus	0.611

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
201	Sawmilling and planing of wood, impregnation of wood	2.404
174	Manufacture of made-up textile articles, except apparel	1.884
204	Manufacture of wooden containers	1.791
203	Manufacture of builders' carpentry and joinery	1.764
202	Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board	1.609
Top-3 sectors (NACE 2-digit)		
20	Wood and products of wood and cork	1.705
18	Wood and products of wood and cork	0.833
17	Textiles and textile products	0.738

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
160	Tobacco products	4.985
247	Manufacture of man-made fibres	3.022
154	Manufacture of vegetable and animal oils and fats	2.604
232	Refined petroleum products	2.484
352	Manufacture of railway, tramway locomotives, rolling stock	2.423
172	Textile weaving	-1.526
171	Preparation and spinning of textile fibres	-2.084
323	Manuf. of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	-2.186
353	Manufacture of aircraft and spacecraft	-2.959
231	Coke oven products	-4.218
The 3 winning and 3 losing sectors (NACE 2-digit)		
16	Tobacco products	4.985
23	Coke, refined petroleum and nuclear fuel	2.246
35	Transport equipment	1.521
32	Radio, television and communication equipment	-0.387
19	Leather, leather productsand footwear	-0.923
18	Wearing apparel, dressing and dyeing of fur	-1.096

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
	n.a.	n.a.
	n.a.	n.a.
	n.a.	n.a.
	n.a.	n.a.
	n.a.	n.a.
	n.a.	n.a.
	n.a.	n.a.
	n.a.	n.a.
	n.a.	n.a.
	n.a.	n.a.
The 3 winning and 3 losing sectors (NACE 2-digit)		
23	Coke, refined petroleum and nuclear fuel	1.877
20	Wood and products of wood and cork	0.992
31	Electrical machinery and apparatus	0.717
18	Wearing apparel, dressing and dyeing of fur	-1.675
63	Supporting and auxiliary transport activities; activities of travel agencies	-2.491
61	Water transport	-7.643

Source: Eurostat (SBS, Comext).

Table A6.3: Selected Sectors II - Estonia

Revealed comparative advantage (RCA)

		RCA (export)			Export shares in price segments					
					Low			High		
		2010	Change 1999/2010	Change 2007/2010	2009 in %	Change 1999/2009	Change 2007/2009	2009 in %	Change 1999/2009	Change 2007/2009
Top-5 industries (NACE 3-digit)						in percentage points			in percentage points	
203	Manufacture of builders' carpentry and joinery	3.120	0.743	0.183	53.538	-32.648	-6.127	1.407	0.832	-0.791
201	Sawmilling and planing of wood, impregnation of wood	2.384	-0.559	0.020	61.403	-34.564	3.682	6.005	5.876	1.610
174	Manufacture of made-up textile articles, except apparel	2.067	-0.360	-0.173	73.928	-9.562	-5.596	7.991	4.790	2.558
355	Manufacture of other transport equipment n.e.c.	1.978	0.251	0.067	15.887	8.080	14.518	0.000	0.000	-0.634
183	Dressing and dyeing of fur; manufacture of articles of fur	1.831	-0.726	-0.361	0.568	-3.493	0.568	96.201	12.333	-3.799

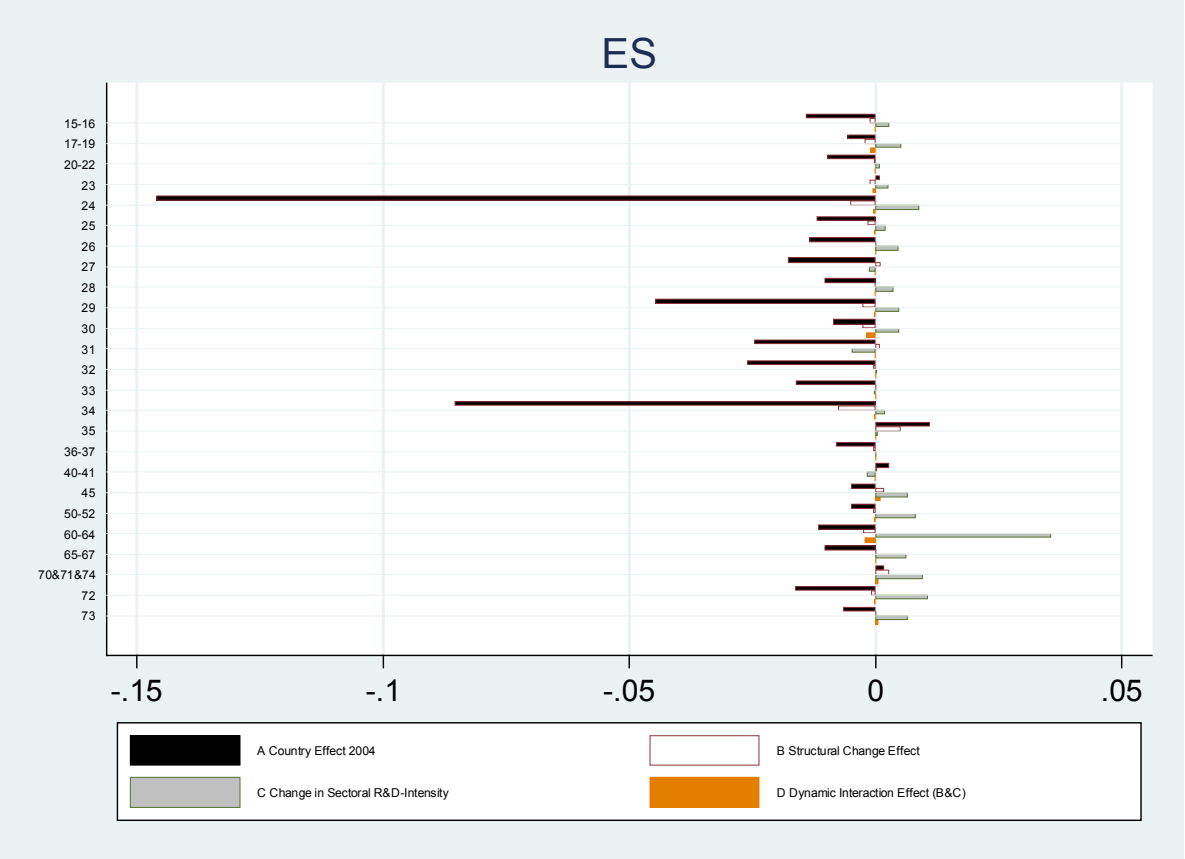
Relative value added (RVA)

		RVA		RCA (export)			Export shares in price segments				
							Low			High	
		2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Change 1999/2007	Change 2007/2009	2007	Change 1999/2007	Change 2007/2009
Top-5 industries (NACE 3-digit)								in percentage points			in percentage points	
201	Sawmilling and planing of wood, impregnation of wood	11.065	-	2.364	-0.579	0.020	57.721	-38.246	3.682	4.395	4.266	1.610
174	Manufacture of made-up textile articles, except apparel	6.578	-	2.240	-0.187	-0.173	79.524	-3.966	-5.596	5.434	2.233	2.558
204	Manufacture of wooden containers	5.995	-	1.997	-0.499	-0.383	47.143	-48.672	23.476	0.599	0.342	0.164
203	Manufacture of builders' carpentry and joinery	5.835	-	2.937	0.560	0.183	59.666	-26.521	-6.127	2.198	1.623	-0.791
202	Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board	4.999	-	1.478	-0.684	0.126	78.733	8.853	-23.303	8.178	7.525	0.938

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext).

Graph A6.3: Sectoral R&D decomposition: Change in structure, R&D intensity and interaction between structure and intensity, NACE-2-digit level



1.7. Ireland

Trade and industry specialisation

At the detailed manufacturing industry level, Ireland is highly specialised in technology-driven industries such as computers, pharmaceuticals and electronic valves. In valued added, Ireland is also specialised in capital-intensive industries (e.g., basic chemicals). At the more aggregated sector level, Ireland is specialised in high and medium-high innovation-intensive sectors such as medical, precision and optical instruments and chemicals. However, Ireland is not specialised in high education sectors, due to low relative shares in software and research and development. The share of exports to the BRIC countries is below the EU average, indicating unused potential to exploit growth opportunities.

Export quality and sectoral R&D performance

Ireland features high shares of exports in high price segments and low shares in low price segments, indicating a position high up on the quality ladder. In contrast, its R&D intensity is far below the average given its industrial structure. Overall, whilst as regards specialisation and quality Ireland is a typical member of the group of higher income countries specialised in knowledge-intensive industries (group 1), its R&D performance is more similar to the group of lower income countries featuring trade specialisation in knowledge-intensive industries (group 3) which operate more at the production- and assembly-oriented segments of the value chain.

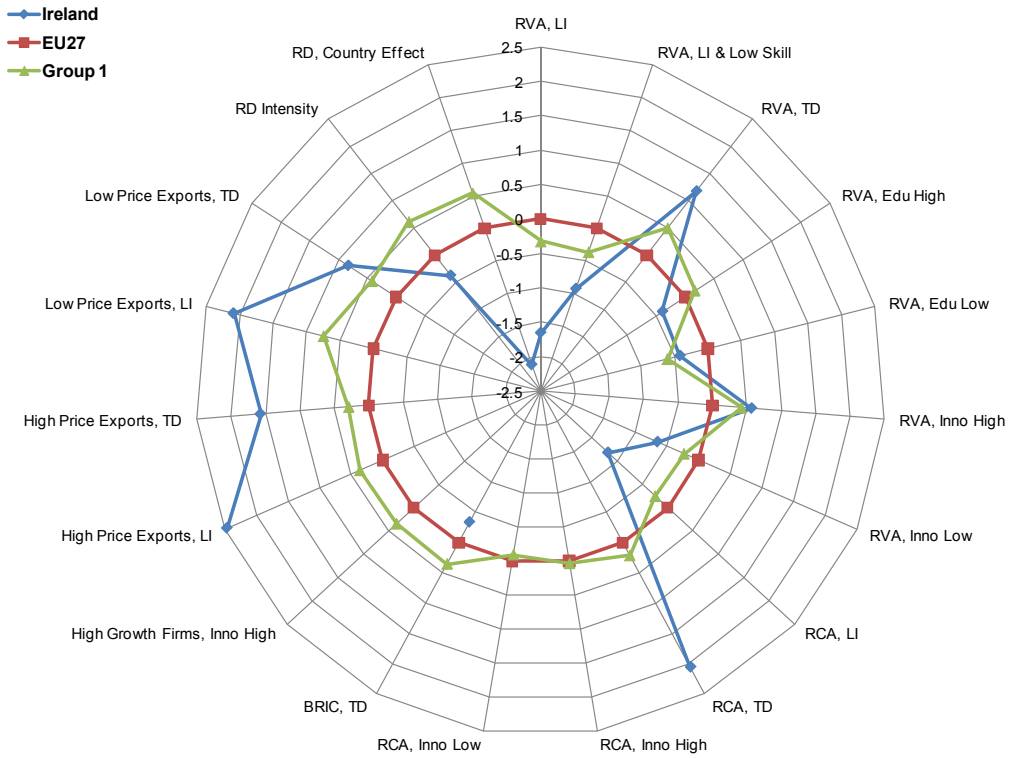
Structural change

In terms of change, Ireland considerably increased its sectoral R&D intensity, taking account of its industrial structure, and climbed up the quality ladder, however the extent of change has been much higher than on average in group 1. Ireland reduced value added specialisation in high innovation sectors (communication equipment), which also explains decreasing overall R&D intensity, but increased trade specialisation in technology-driven industries (optical instruments, pharmaceuticals). The top winning sector in value added is air transport. Overall, the outlook for Ireland's favourable competitiveness position remains unchanged (from a purely structural viewpoint, given Irelands problems at the macro-economic and financial level), however Ireland needs to move further up the value chain to the knowledge-creating parts of the knowledge-intensive industries it is specialised in.

Impact of the crisis

The crisis seems to have hit capital-intensive and marketing-driven industries in Ireland, while favouring technology-driven ones.

Graph A7.1: Level



Graph A7.2: Change

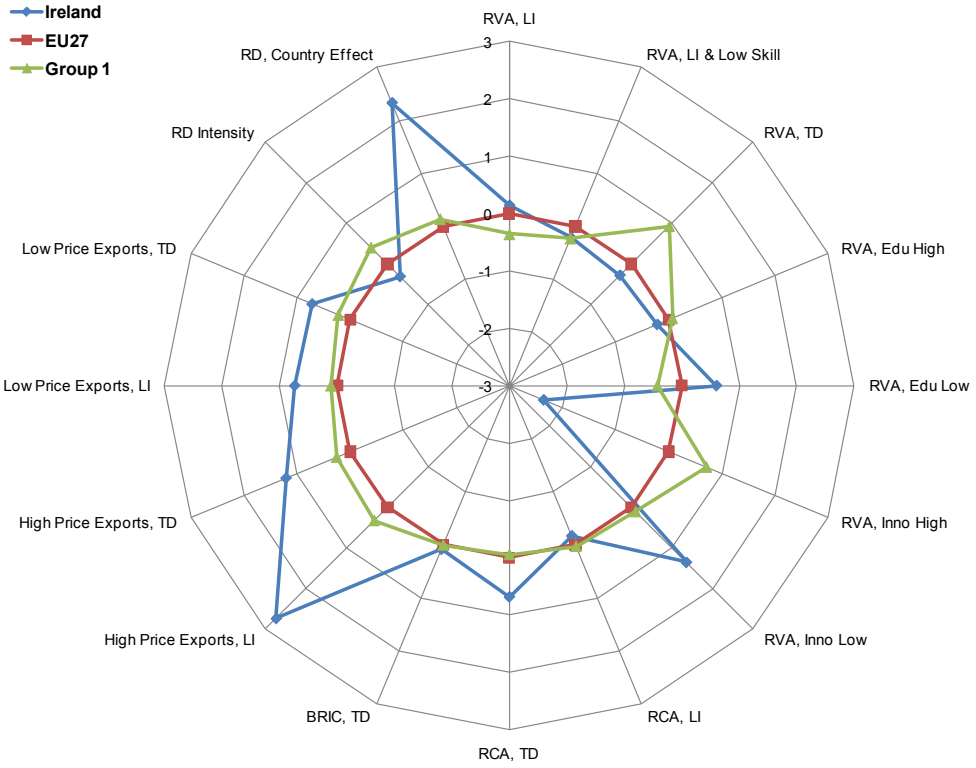


Table A7.1: Summary table - Ireland

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2007	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
Factor inputs																						
Mainstream industries	-1.053	-0.085									-1.633	-0.353	-0.046	0.116	0.056	0.024	58.371	18.706				
Labourintensive industries	-1.273	0.058									-1.879	-0.451	-0.135	0.025	0.008	-0.006	77.392	13.928				
Capital intensive industries	0.627	-0.071									-0.121	-0.198	-0.188	0.304	0.175	0.057	91.671	5.176				
Marketing driven industries	0.332	0.127									-0.123	-0.094	-0.168	0.237	-0.044	0.050	42.282	27.057				
Technology driven industries	0.385	-0.018									0.626	0.112	0.067	1.983	1.508	0.291	80.193	6.633				
Skill intensity																						
Low skill industries	-0.262	0.060																				
Medium/blue collar workers	-1.434	0.049																				
Medium/white collar workers	0.674	0.090																				
High skill industries	-0.026	-0.175																				
Labour intensive and low skill industries	-1.665	-0.207																				
Revealed quality elasticity																						
High RQE	-0.230	0.065									0.270	0.591	0.337	0.776	0.453	0.278	79.348	9.343				
Medium RQE	0.010	-0.024									-0.445	-0.864	-0.555	1.536	1.070	0.069	58.266	14.114				
Low RQE	0.247	-0.036									-0.196	-0.147	-0.195	0.353	0.180	0.069	90.500	4.877				
											2009	Change 2004/2009	Change 2007/2009									
INNOTYPE																						
High	0.199	-0.236	15.374	-4.893	n.a.	n.a.	n.a.	1	0	0	n.a.	n.a.	n.a.						0.558	-0.549	0.186	0.010
Med-high	0.210	-0.329	13.853	-3.793	n.a.	n.a.	n.a.	1	0	0	n.a.	n.a.	n.a.						0.208	-1.123	-0.042	0.018
Med	-0.320	0.182	14.599	4.244	n.a.	n.a.	n.a.	5	0	0	n.a.	n.a.	n.a.						0.037	-0.053	0.000	0.008
Med-low	0.398	-0.140	19.597	-0.854	n.a.	n.a.	n.a.	1	0	0	n.a.	n.a.	n.a.						0.062	-0.084	-0.007	0.018
Low	-0.143	0.346	9.462	1.934	n.a.	n.a.	n.a.	5	0	0	n.a.	n.a.	n.a.						0.055	0.032	0.000	0.050
EDUTYPE																						
High	-0.120	-0.033	20.301	1.773	n.a.	n.a.	n.a.	2	-1	0	n.a.	n.a.	n.a.									
Med-high	1.127	-0.181	21.161	-0.899	n.a.	n.a.	n.a.	1	0	0	n.a.	n.a.	n.a.									
Med	-0.230	0.142	25.518	0.800	n.a.	n.a.	n.a.	4	-1	0	n.a.	n.a.	n.a.									
Med-low	-0.255	0.105	6.195	-1.197	n.a.	n.a.	n.a.	5	0	0	n.a.	n.a.	n.a.									
Low	-0.089	0.072	26.824	-0.478	n.a.	n.a.	n.a.	5	3	0	n.a.	n.a.	n.a.									
Total	0.000	0.000	100.000	0.000	n.a.	n.a.	n.a.	1	0	0	n.a.	n.a.	n.a.	2.665	1.703	0.417	77.412	9.338	0.923	-1.795	0.137	0.105

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A7.2: Selected Sectors I - Ireland

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
244	Manufacture of pharmaceuticals, medicinal chemicals and botanical products	1.613
246	Manufacture of other chemical products	1.575
331	Manufacture of medical and surgical equipment and orthopaedic appliances	1.484
334	Manufacture of optical instruments, photographic equipment	1.111
241	Manufacture of basic chemicals	1.095
Top-3 sectors (NACE 2-digit)		
24	Chemicals and chemical products	1.307
33	Medical, precision and optical instruments	0.903
30	Office, accounting and computing machinery	0.613

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
223	Reproduction of recorded media	3.451
30	Manufacture of office machinery and computers	2.064
241	Manufacture of basic chemicals	1.875
331	Manufacture of medical and surgical equipment and orthopaedic appliances	1.557
321	Manufacture of electronic valves and tubes and other electronic components	1.556
Top-3 sectors (NACE 2-digit)		
30	Office, accounting and computing machinery	2.342
24	Chemicals and chemical products	1.467
33	Medical, precision and optical instruments	1.261

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
296	Manufacture of weapons and ammunition	4.186
263	Manufacture of ceramic tiles and flags	4.162
265	Manufacture of cement, lime and plaster	1.464
243	Manufacture of paints, varnishes and similar coatings, printing ink and mastics	1.290
221	Publishing	0.931
171	Preparation and spinning of textile fibres	-1.998
335	Manufacture of watches and clocks	-2.034
231	Coke oven products	-2.267
191	Tanning and dressing of leather	-2.770
183	Dressing and dyeing of fur; manufacture of articles of fur	-4.522
The 3 winning and 3 losing sectors (NACE 2-digit)		
33	Medical, precision and optical instruments	0.754
22	Printing, publishing and reproduction	0.651
23	Coke, refined petroleum and nuclear fuel	0.625
32	Radio, television and communication equipment	-1.064
34	Motor vehicles, trailers and semi-trailers	-1.156
31	Electrical machinery and apparatus	-1.159

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
223	Reproduction of recorded media	3.439
331	Manufacture of medical and surgical equipment and orthopaedic appliances	2.070
30	Manufacture of office machinery and computers	1.677
334	Manufacture of optical instruments, photographic equipment	1.330
158	Manufacture of other food products	0.763
16	Manufacture of tobacco products	-0.567
244	Manufacture of pharmaceuticals, medicinal chemicals and botanical products	-0.653
313	Manufacture of insulated wire and cable	-0.709
362	Manufacture of jewellery and related articles	-0.871
321	Manufacture of electronic valves and tubes and other electronic components	-2.450
The 3 winning and 3 losing sectors (NACE 2-digit)		
62	Air transport	2.170
33	Medical, precision and optical instruments	0.921
71	Renting of machinery and equipment	0.892
64	Post and telecommunications	-0.338
32	Radio, television and communication equipment	-1.642
24	Chemicals and chemical products	-1.703

Source: Eurostat (SBS, Comext).

Table A7.3: Selected Sectors II - Ireland

Revealed comparative advantage (RCA)

		RCA (export)			Export shares in price segments					
		2010	Change 1999/2010	Change 2007/2010	2009 in %	Low Change 1999/2009	Change 2007/2009	2009 in %	High Change 1999/2009	Change 2007/2009
Top-5 industries (NACE 3-digit)						in percentage points			in percentage points	
244	Manufacture of pharmaceuticals, medicinal chemicals and botanical products	1.613	0.533	0.355	8.308	-9.317	-2.826	83.765	12.255	5.875
246	Manufacture of other chemical products	1.575	0.367	-0.041	0.516	-0.341	-0.122	95.720	1.073	-0.292
331	Manufacture of medical and surgical equipment and orthopaedic appliances	1.484	0.595	0.233	12.010	5.365	5.178	74.144	-3.008	-0.079
334	Manufacture of optical instruments, photographic equipment	1.111	0.924	0.236	10.437	9.568	9.759	28.607	-56.394	-67.789
241	Manufacture of basic chemicals	1.095	-0.121	-0.251	0.581	0.000	0.347	98.923	0.780	-0.277

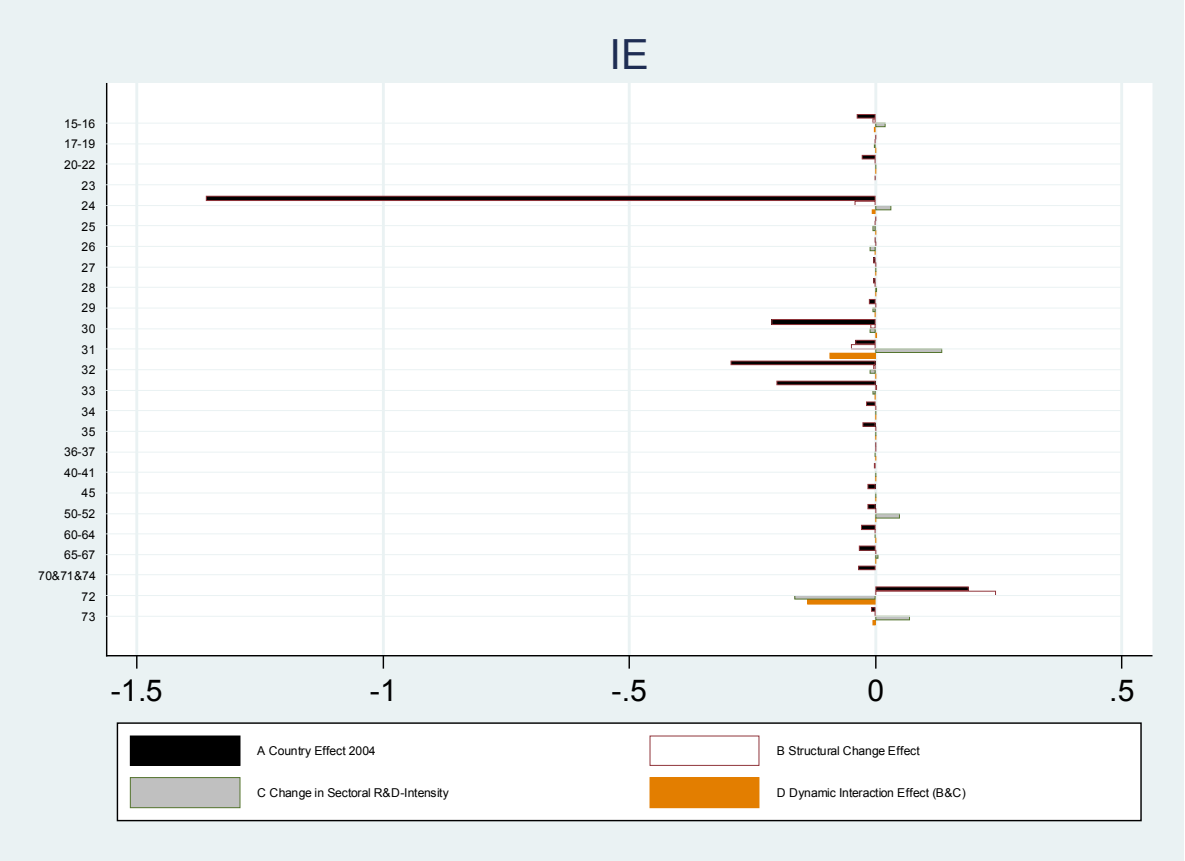
Relative value added (RVA)

		RVA		RCA (export)			Export shares in price segments					
		2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Low Change 1999/2007	Change 2007/2009	2007	High Change 1999/2007	Change 2007/2009
Top-5 industries (NACE 3-digit)								in percentage points			in percentage points	
223	Reproduction of recorded media	31.520	5.335	-	-	-	-	-	-	-	-	-
30	Manufacture of office machinery and computers	7.875	2.110	1.504	-0.106	-0.890	-	-	-	-	-	-
241	Manufacture of basic chemicals	6.518	0.110	1.346	0.130	-0.251	0.234	-0.346	0.347	99.199	1.057	-0.277
331	Manufacture of medical and surgical equipment and orthopaedic appliances	4.743	2.250	1.251	0.361	0.233	6.832	0.187	5.178	74.223	-2.929	-0.079
321	Manufacture of electronic valves and tubes and other electronic components	4.740	-2.399	0.951	0.214	-0.745	6.795	0.993	-6.367	80.897	1.437	-6.744

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext).

Graph A7.3: Sectoral R&D decomposition: Change in structure, R&D intensity and interaction between structure and intensity, NACE-2-digit level



1.8. Greece

Trade and industry specialisation

At the detailed manufacturing industry level, Greece features strong specialisation in marketing driven industries (manufacture of vegetable oils, processing and preserving of fruit and vegetables), as well as in labour-intensive (dressing and dyeing of fur) and capital-intensive industries (manufacture of cement, lime and plaster). At the more aggregated sector level, Greece is specialised in low and medium-low innovation and education sectors, such as wearing apparel and water transport. The export shares to the BRIC countries are very low.

Export quality and sectoral R&D performance

Greece features high shares in the low price segment of labour-intensive industries and low shares in the high price segment of labour-intensive industries. This is by way of contrast to the rest of the group of higher income countries specialised in labour-intensive industries; it is somewhat higher up on the quality ladder in technology-driven industries, but still below the EU average. The same holds true for its R&D intensity, which is below average given its industrial structure but above its group average.

Structural change

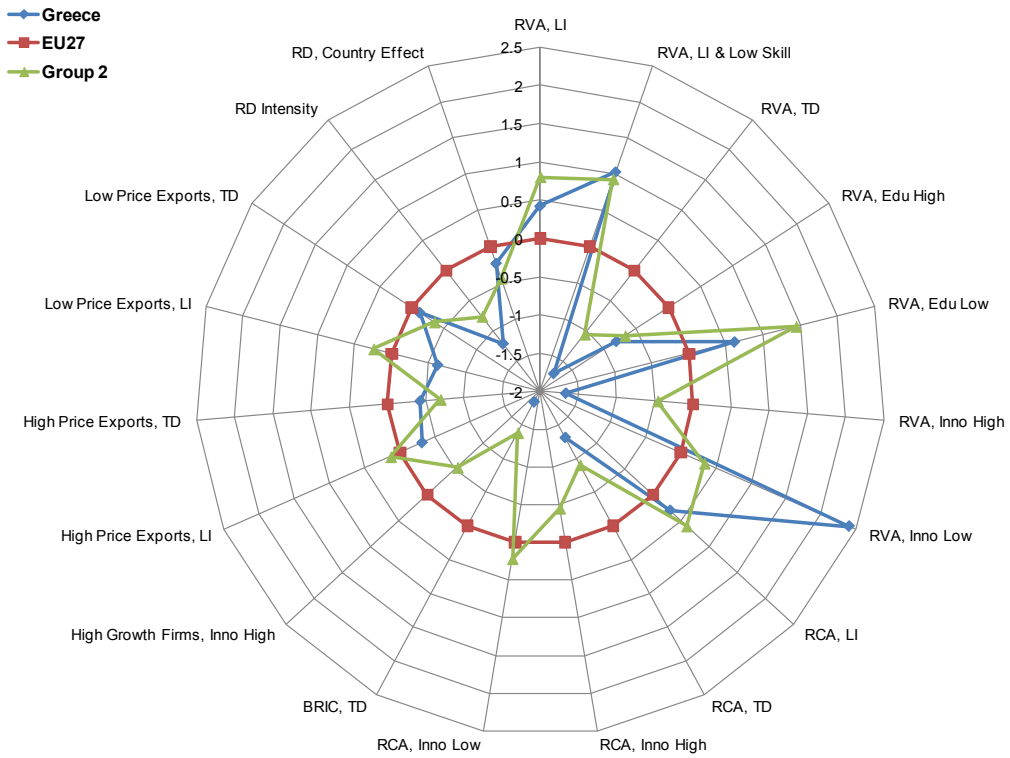
In terms of change, Greece increased the relative shares of mainstream manufacturing (manufacture of batteries, accumulators) and technology-driven industries (electronic valves) in exports, while it decreased the relative shares of the same industry types in value added (manufacture of electric motors, motor vehicles). It further increased its specialisation in labour-intensive industries. Moreover, Greece considerably increased its relative share in highly innovation-intensive sectors – albeit from a very low level - (machinery, computers, and instruments) and decreased its relative share of low innovation sectors (hotels and restaurants, water transport). Greece shows a mixed performance on the quality ladder, with some indicators improving and others deteriorating. Its sectoral R&D intensity decreased relative to the average, however there is increasing intensity in computers.

Overall, Greece shows an unfavourable competitiveness position, while the structural dynamics are mixed, showing improvement in some areas (from low levels) but deterioration in others.

Impact of the crisis

The crisis seems to have had a limited impact on Greece's economic structure, with only marketing-driven industries clearly faring better in exports during the crisis than before.

Graph A8.1: Level



Graph A8.2: Change

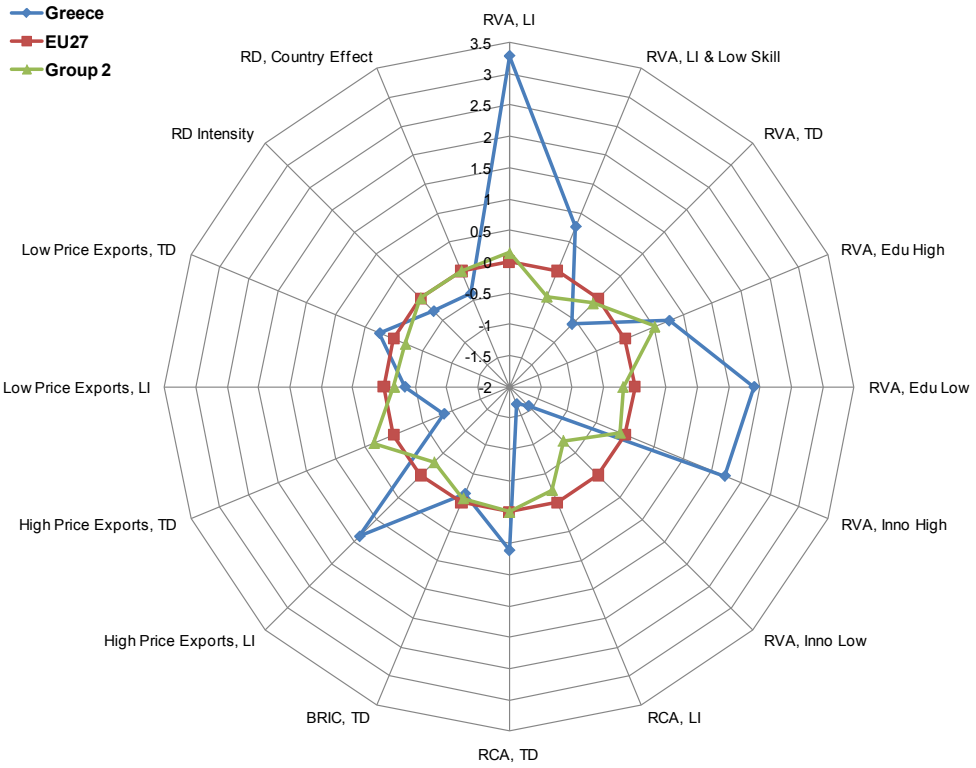


Table A8.1: Summary table - Greece

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2007	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
Factor inputs																						
Mainstream industries	-0.374	-0.130									-0.212	0.284	0.040	0.436	0.267	-0.169	13.928	59.997				
Labourintensive industries	0.169	0.369									0.200	-0.541	-0.094	1.064	-0.109	-0.004	30.846	36.937				
Capital intensive industries	0.168	-0.479									0.359	-0.086	-0.076	0.869	0.210	0.189	5.335	60.843				
Marketing driven industries	0.571	0.191									0.617	-0.035	0.096	0.567	0.210	0.076	25.506	40.684				
Technology driven industries	-1.154	-0.162									-0.806	0.513	0.059	0.260	-0.350	0.134	37.239	18.360				
Skill intensity																						
Low skill industries	0.440	-0.165																				
Medium/blue collar workers	-0.294	0.449																				
Medium/white collar workers	0.035	0.093																				
High skill industries	-0.961	0.019																				
Labour intensive and low skill industries	0.641	0.088																				
Revealed quality elasticity																						
High RQE	-0.385	-0.147									-0.431	-0.105	0.029	0.483	-0.372	-0.110	28.368	32.375				
Medium RQE	0.201	0.192									0.128	0.121	-0.080	1.412	0.122	0.060	19.636	41.739				
Low RQE	0.138	-0.124									0.387	-0.042	0.047	1.302	0.478	0.277	13.792	60.653				
											2009	Change 2004/2009	Change 2007/2009									
INNOTYPE																						
High	-1.062	1.159	2.080	0.729	n.a.	n.a.	n.a.	5	0	0	n.a.	n.a.	n.a.						0.089	-0.056	0.003	-0.007
Med-high	-0.136	0.331	10.254	-0.322	n.a.	n.a.	n.a.	4	-1	0	n.a.	n.a.	n.a.						0.042	-0.154	-0.005	0.001
Med	-0.216	0.251	12.627	-0.125	n.a.	n.a.	n.a.	5	2	-	n.a.	n.a.	n.a.						0.013	-0.035	0.002	0.003
Med-low	0.223	0.306	6.932	-0.995	n.a.	n.a.	n.a.	5	3	-	n.a.	n.a.	n.a.						0.041	-0.140	0.001	0.002
Low	0.398	-0.180	15.641	0.170	n.a.	n.a.	n.a.	2	-3	+	n.a.	n.a.	n.a.						0.015	-0.019	0.000	0.009
EDUTYPE																						
High	-0.265	0.146	10.773	0.739	n.a.	n.a.	n.a.	5	3	-	n.a.	n.a.	n.a.									
Med-high	-0.435	0.510	5.272	0.668	n.a.	n.a.	n.a.	5	0	0	n.a.	n.a.	n.a.									
Med	-0.059	0.063	32.335	-2.063	n.a.	n.a.	n.a.	3	2	-	n.a.	n.a.	n.a.									
Med-low	0.326	-0.458	16.755	-0.300	n.a.	n.a.	n.a.	1	-4	+	n.a.	n.a.	n.a.									
Low	0.118	0.197	34.864	0.955	n.a.	n.a.	n.a.	2	0	0	n.a.	n.a.	n.a.									
Total	0.000	0.000	100.000	0.000	n.a.	n.a.	n.a.	1	-1	0	n.a.	n.a.	n.a.	3.196	0.229	0.226	20.126	46.130	0.205	-0.422	0.001	0.008

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A8.2: Selected Sectors I - Greece

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
183	Dressing and dyeing of fur; manufacture of articles of fur	4.059
265	Manufacture of cement, lime and plaster	2.706
153	Processing and preserving of fruit and vegetables	2.290
267	Cutting, shaping and finishing of stone	2.154
176	Manufacture of knitted and crocheted fabrics	2.052
Top-3 sectors (NACE 2-digit)		
16	Tobacco	1.377
18	Wearing apparel, dressing and dyeing of fur	1.124
23	Coke, refined petroleum and nuclear fuel	0.861

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
183	Dressing and dyeing of fur; manufacture of articles of fur	3.207
154	Manufacture of vegetable and animal oils and fats	1.793
265	Manufacture of cement, lime and plaster	1.668
23	Manufacture of coke, refined petroleum products and nuclear fuel	1.358
351	Building and repairing of ships and boats	1.171
Top-3 sectors (NACE 2-digit)		
61	Water transport	1.171
23	Coke, refined petroleum and nuclear fuel	1.083
18	Wearing apparel, dressing and dyeing of fur	0.853

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
321	Manufacture of electronic valves and tubes and other electronic components	1.797
335	Manufacture of watches and clocks	1.626
314	Manufacture of accumulators, primary cells and primary batteries	1.569
364	Manufacture of sports goods	1.273
176	Manufacture of knitted and crocheted fabrics	1.231
182	Manufacture of other wearing apparel and accessories	-1.119
296	Manufacture of weapons and ammunition	-1.138
154	Manufacture of vegetable and animal oils and fats	-1.214
181	Manufacture of leather clothes	-1.570
233	Nuclear fuel	-3.651
The 3 winning and 3 losing sectors (NACE 2-digit)		
22	Printing, publishing and reproduction	0.620
21	Pulp, paper and paperboard	0.593
36	Furniture, jewellery, musical instruments, sports goods, games and toys	0.420
15	Food and beverages	-0.157
23	Coke, refined petroleum and nuclear fuel	-0.781
18	Wearing apparel, dressing and dyeing of fur	-0.920

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
183	Dressing and dyeing of fur; manufacture of articles of fur	18.307
222	Printing and service activities related to printing	2.083
281	Manufacture of structural metal products	1.873
181	Manufacture of leather clothes	1.720
314	Manufacture of accumulators, primary cells and primary batteries	1.462
296	Manufacture of weapons and ammunition	-1.680
274	Manufacture of basic precious and non-ferrous metals	-1.717
23	Manufacture of coke, refined petroleum products and nuclear fuel	-2.015
171	Preparation and spinning of textile fibres	-3.209
265	Manufacture of cement, lime and plaster	-3.651
The 3 winning and 3 losing sectors (NACE 2-digit)		
23	Coke, refined petroleum and nuclear fuel	1.576
16	Tobacco products	1.497
18	Wearing apparel, dressing and dyeing of fur	1.417
55	Hotels and restaurants	-0.825
52	Retail trade, except of motor vehicles and motorcycles; repair of household goods	-1.508
61	Water transport	-1.640

Source: Eurostat (SBS, Comext).

Table A8.3: Selected Sectors II - Greece

Revealed comparative advantage (RCA)

		RCA (export)			Export shares in price segments					
		2010	Change 1999/2010	Change 2007/2010	2009 in %	Low Change 1999/2009	Change 2007/2009	2009 in %	High Change 1999/2009	Change 2007/2009
Top-5 industries (NACE 3-digit)						in percentage points			in percentage points	
183	Dressing and dyeing of fur; manufacture of articles of fur	4.059	0.067	0.099	1.774	1.762	1.170	96.854	5.813	0.331
265	Manufacture of cement, lime and plaster	2.706	-0.392	0.063	89.649	-5.418	-2.970	0.439	0.045	-0.996
153	Processing and preserving of fruit and vegetables	2.290	-0.071	0.107	57.675	3.773	0.373	25.267	13.021	2.219
267	Cutting, shaping and finishing of stone	2.154	0.397	0.499	35.615	-14.603	-4.697	44.251	23.499	4.065
176	Manufacture of knitted and crocheted fabrics	2.052	1.231	0.331	42.799	-31.500	-34.901	1.813	0.352	0.381

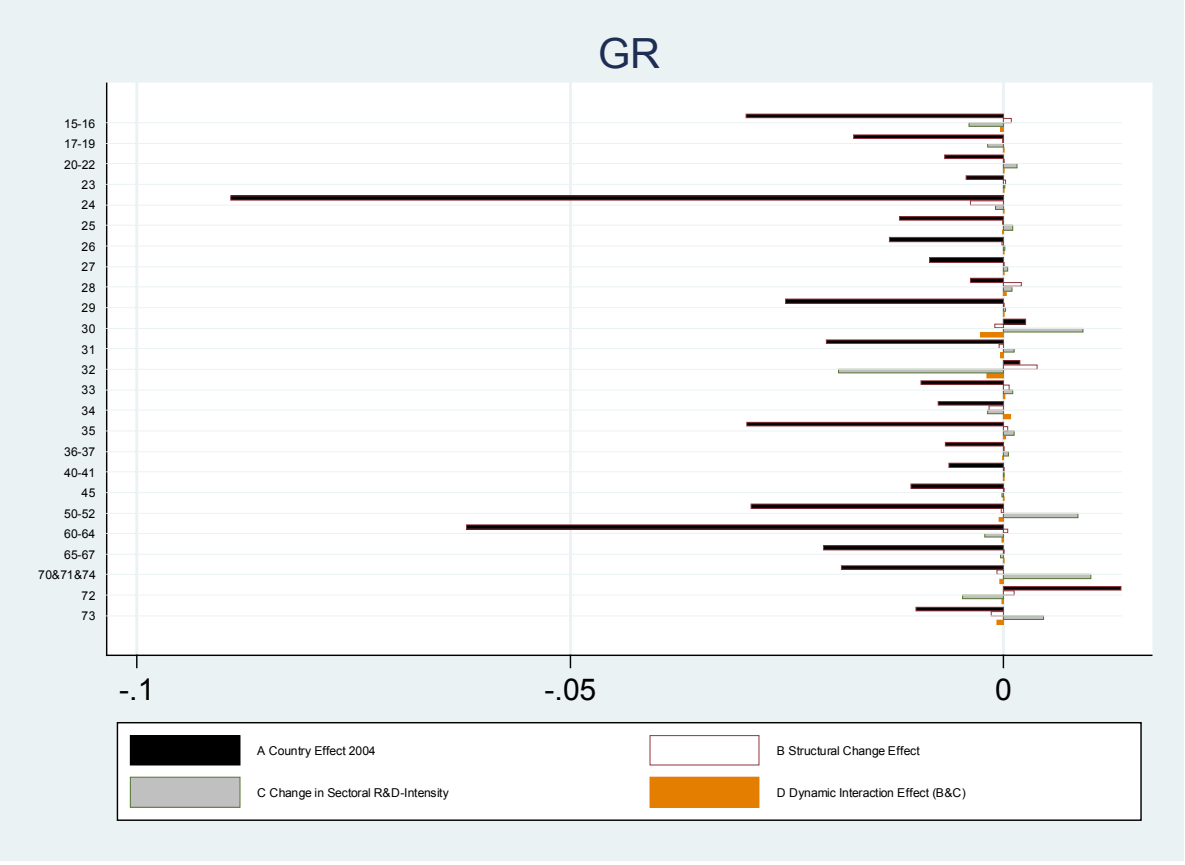
Relative value added (RVA)

		RVA		RCA (export)			Export shares in price segments					
		2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Low Change 1999/2007	Change 2007/2009	2007	High Change 1999/2007	Change 2007/2009
Top-5 industries (NACE 3-digit)								in percentage points			in percentage points	
183	Dressing and dyeing of fur; manufacture of articles of fur	24.715	19.165	3.959	-0.033	0.099	0.604	0.592	1.170	96.523	5.482	0.331
154	Manufacture of vegetable and animal oils and fats	6.005	0.686	1.830	-0.919	-0.295	11.564	6.942	2.775	18.359	6.499	10.636
265	Manufacture of cement, lime and plaster	5.300	-4.310	2.643	-0.455	0.063	92.619	-2.449	-2.970	1.434	1.040	-0.996
23	Manufacture of coke, refined petroleum products and nuclear fuel	3.889	-1.871	1.245	-0.398	-0.383	-	-	-	-	-	-
351	Building and repairing of ships and boats	3.225	0.445	-0.168	-0.120	0.420	12.035	-3.480	-4.520	78.836	11.261	5.489

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext).

Graph A8.3: Sectoral R&D decomposition: Change in structure, R&D intensity and interaction between structure and intensity, NACE-2-digit level



1.9. Spain

Trade and industry specialisation

At the detailed manufacturing industry level, Spain is specialised in marketing-driven industries (particularly at an export level, processing and preserving of fish and fruit, manufacture of vegetable oil), capital-intensive (ceramic tiles) and labour-intensive industries (cutting and finishing of stone). At the more aggregated sector level, Spain is specialised in low innovation and low education sectors (construction, wearing apparel). In addition, at an export level it is specialised in medium-high innovation sectors such as motor vehicles and non-metallic mineral products.

Export quality and sectoral R&D performance

Spain features a high share of exports in the low price segment and a low share of exports in the high price segment, well below the EU average and its group of higher income countries specialised in labour-intensive industries. While its R&D intensity is below average given its industrial structure, it is close to the average and higher than its group average.

Structural change

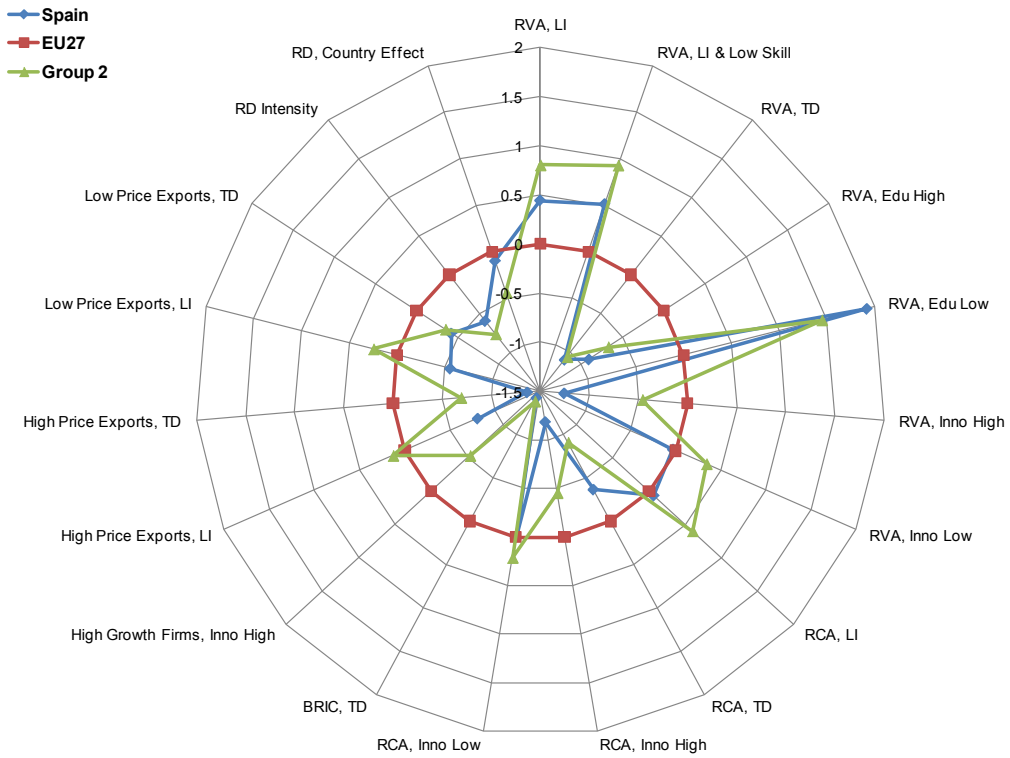
In terms of change, Spain increased relative value added in high education sectors (software, businesses services) but decreased it in high innovation sectors (computers), as well as in labour-intensive low-skill (dressing and dyeing of fur) and technology-driven industries (communication equipment). Export specialisation in marketing-driven and labour-intensive industries (wearing apparel) further increases. Spain increased its R&D country effect substantially, while at the same time falling further down the quality ladder.

Overall, Spain faces an unfavourable competitiveness position with mixed signals as to change dynamics. Spain's efforts to boost R&D may take some time before they become visible in specialisation or quality indicators.

Impact of the crisis

The impact of the crisis on the Spanish industrial structure seems to have been limited overall, with technology-driven industries suffering and all the other industry types gaining relative shares in the crisis.

Graph A9.1: Level



Graph A9.2: Change

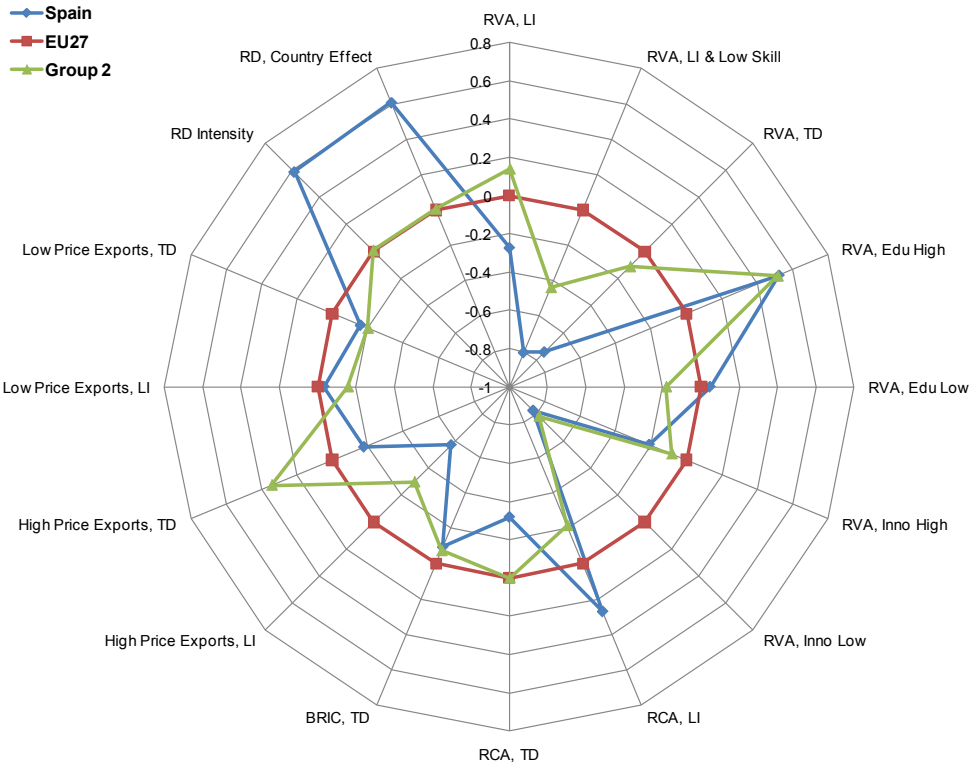


Table A9.1: Summary table - Spain

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2007	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
																Percentage points						
Factor inputs																						
Mainstream industries	-0.089	-0.009									-0.140	0.050	0.039	0.991	0.451	0.127	13.486	51.858				
Labourintensive industries	0.175	-0.025									0.046	0.144	0.078	0.583	0.179	0.256	22.608	35.634				
Capital intensive industries	0.194	0.037									0.162	-0.025	0.008	1.325	0.976	0.367	12.184	56.504				
Marketing driven industries	0.198	0.054									0.247	0.016	0.031	0.671	0.312	0.206	18.162	41.002				
Technology driven industries	-0.577	-0.118									-0.168	-0.105	-0.085	0.736	0.199	-0.050	17.047	42.861				
Skill intensity																						
Low skill industries	0.266	-0.033																				
Medium/blue collar workers	0.043	-0.057																				
Medium/white collar workers	-0.096	0.141																				
High skill industries	-0.563	-0.071																				
Labour intensive and low skill industries	0.369	-0.110																				
Revealed quality elasticity																						
High RQE	-0.242	-0.124									-0.041	-0.087	-0.042	1.840	0.688	0.282	17.202	46.194				
Medium RQE	0.105	0.085									-0.068	0.076	0.041	1.042	0.544	0.310	14.121	45.249				
Low RQE	0.144	0.016									0.128	0.070	0.033	1.424	0.886	0.315	15.559	48.641				
											2009	Change 2004/2009	Change 2007/2009									
INNOTYPE																						
High	-0.681	-0.056	4.801	-0.268	0.024	1.872	-0.331	3	1	-	-0.576	n.a.	0.015						0.168	-0.117	-0.005	0.022
Med-high	-0.152	-0.136	11.046	-3.345	-0.230	-0.728	-0.566	3	1	0	0.130	n.a.	-0.027						0.278	-0.227	-0.009	0.019
Med	-0.183	0.009	17.587	1.095	-0.291	-0.495	-0.158	2	-3	+	0.215	n.a.	0.026						0.048	-0.027	-0.001	0.011
Med-low	-0.091	-0.183	7.236	-1.271	-0.219	6.229	-0.282	2	-2	+	0.226	n.a.	-0.003						0.170	0.025	-0.003	0.052
Low	-0.006	-0.144	12.595	-1.184	-0.189	-0.003	-0.157	5	3	-	0.009	n.a.	0.092						0.024	0.002	-0.001	0.008
EDUTYPE																						
High	-0.303	0.103	14.725	1.869	-0.238	-0.010	-0.043	3	-2	+	-0.104	n.a.	0.056									
Med-high	-0.438	-0.113	4.995	-0.788	-0.196	3.373	-0.309	2	0	-	-0.307	n.a.	-0.071									
Med	-0.102	0.030	31.974	-1.447	-0.032	2.831	-0.095	3	1	0	-0.041	n.a.	0.005									
Med-low	0.019	-0.131	11.151	-2.089	-0.167	-0.956	-0.161	3	0	0	-0.366	n.a.	-0.044									
Low	0.327	0.004	37.154	2.455	-0.010	-0.386	-0.024	1	0	0	0.398	n.a.	0.046									
Total	0.000	0.000	100.000	0.000	-0.098	0.000	-0.074	3	1	0	0.000	n.a.	0.000	4.306	2.117	0.906	16.000	46.682	0.736	-0.324	-0.017	0.128

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A9.2: Selected Sectors I - Spain

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
263	Manufacture of ceramic tiles and flags	1.837
267	Cutting, shaping and finishing of stone	1.429
152	Processing and preserving of fish and fish products	1.162
154	Manufacture of vegetable and animal oils and fats	1.110
153	Processing and preserving of fruit and vegetables	0.848
Top-3 sectors (NACE 2-digit)		
26	Non-metallic mineral products	0.605
34	Motor vehicles, trailers and semi-trailers	0.495
18	Wearing apparel, dressing and dyeing of fur	0.406

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
263	Manufacture of ceramic tiles and flags	1.448
154	Manufacture of vegetable and animal oils and fats	1.147
267	Cutting, shaping and finishing of stone	1.124
265	Manufacture of cement, lime and plaster	1.015
152	Processing and preserving of fish and fish products	0.902
Top-3 sectors (NACE 2-digit)		
45	Construction	0.643
23	Coke, refined petroleum and nuclear fuel	0.594
26	Non-metallic mineral products	0.414

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
233	Nuclear fuel	0.992
177	Manufacture of knitted and crocheted articles	0.982
242	Manufacture of pesticides and other agro-chemical products	0.879
182	Manufacture of other wearing apparel and accessories	0.851
311	Manufacture of electric motors, generators and transformers	0.781
247	Manufacture of man-made fibres	-0.609
300	Manufacture of office machinery and computers	-0.615
365	Manufacture of games and toys	-0.922
283	Manufacture of steam generators, except central heating hot water boilers	-0.967
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	-1.417
The 3 winning and 3 losing sectors (NACE 2-digit)		
18	Wearing apparel, dressing and dyeing of fur	0.783
16	Tobacco products	0.579
21	Pulp, paper and paper products	0.412
36	Furniture, jewellery, musical instruments, sports goods, games and toys	-0.278
22	Printing, publishing and reproduction	-0.476
30	Office, accounting and computing machinery	-0.615

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
23	Manufacture of coke, refined petroleum products and nuclear fuel	1.209
281	Manufacture of structural metal products	0.645
265	Manufacture of cement, lime and plaster	0.583
154	Manufacture of vegetable and animal oils and fats	0.456
267	Cutting, shaping and finishing of stone	0.454
191	Tanning and dressing of leather	-0.593
354	Manufacture of motorcycles and bicycles	-0.598
176	Manufacture of knitted and crocheted fabrics	-0.621
242	Manufacture of pesticides and other agro-chemical products	-0.934
183	Dressing and dyeing of fur; manufacture of articles of fur	-1.402
The 3 winning and 3 losing sectors (NACE 2-digit)		
23	Coke, refined petroleum and nuclear fuel	0.867
70	Real estate activities	0.643
37	Recycling	0.274
30	Office, accounting and computing machinery	-0.395
18	Wearing apparel, dressing and dyeing of fur	-0.526
19	Leather, leather products and footwear	-0.551

Source: Eurostat (SBS, Comext).

Table A9.3: Selected Sectors II - Spain

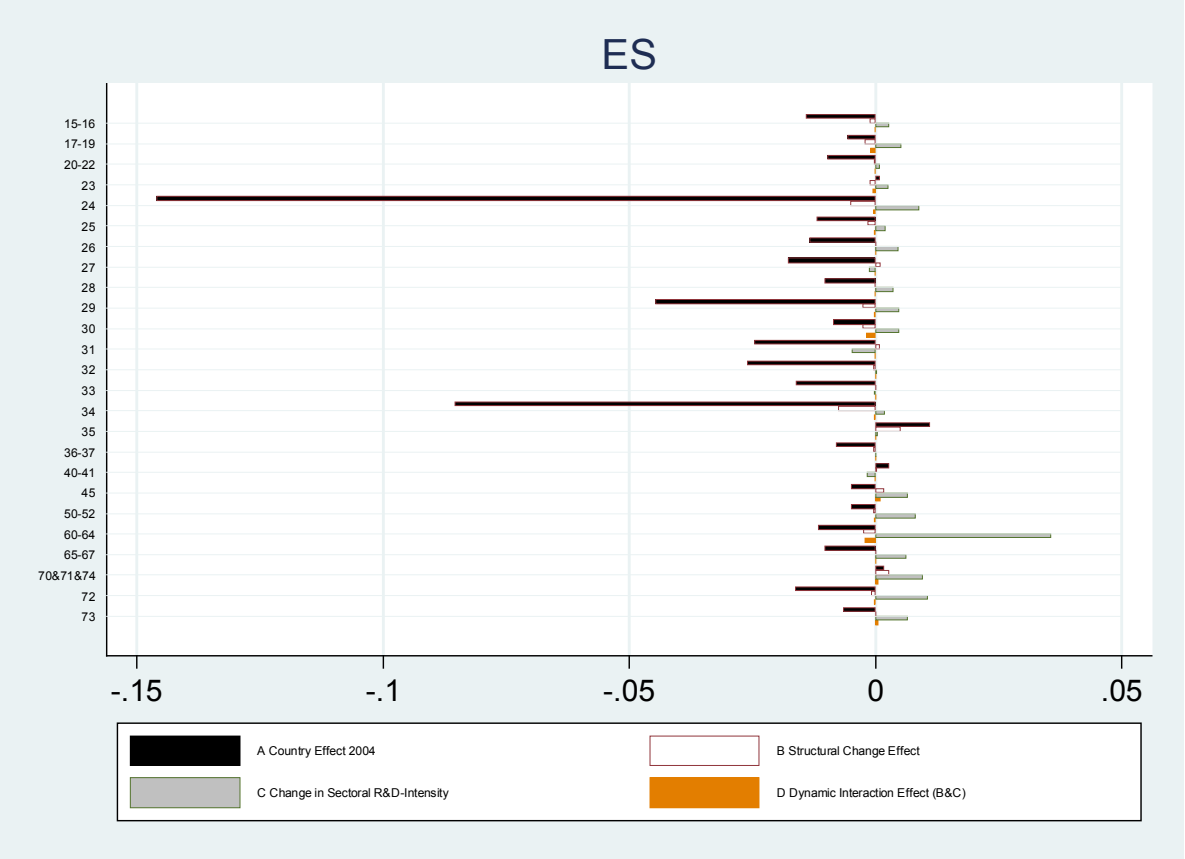
Revealed comparative advantage (RCA)	RCA (export)			Export shares in price segments					
	2010	Change 1999/2010	Change 2007/2010	2009 in %	Low Change 1999/2009	Change 2007/2009	2009 in %	High Change 1999/2009	Change 2007/2009
Top-5 industries (NACE 3-digit)					in percentage points			in percentage points	
263 Manufacture of ceramic tiles and flags	1.837	-0.020	-0.047	33.855	-11.991	3.513	2.028	1.045	-30.506
267 Cutting, shaping and finishing of stone	1.429	0.099	-0.051	29.037	-36.922	-1.233	2.886	1.036	1.492
152 Processing and preserving of fish and fish products	1.162	-0.012	0.018	50.956	8.748	11.098	6.644	-2.613	-0.113
154 Manufacture of vegetable and animal oils and fats	1.110	0.293	-0.112	16.412	-1.100	3.623	11.667	-10.005	-8.936
153 Processing and preserving of fruit and vegetables	0.848	-0.049	0.015	47.797	19.333	9.856	16.625	-18.841	-1.780

Relative value added (RVA)	RVA		RCA (export)			Export shares in price segments					
	2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Low Change 1999/2007	Change 2007/2009	2007	High Change 1999/2007	Change 2007/2009
Top-5 industries (NACE 3-digit)							in percentage points			in percentage points	
263 Manufacture of ceramic tiles and flags	4.255	-0.302	1.883	0.027	-0.047	30.341	-15.505	3.513	32.534	31.551	-30.506
154 Manufacture of vegetable and animal oils and fats	3.150	0.368	1.222	0.405	-0.112	12.789	-4.723	3.623	20.603	-1.069	-8.936
267 Cutting, shaping and finishing of stone	3.077	0.620	1.480	0.150	-0.051	30.269	-35.689	-1.233	1.394	-0.456	1.492
265 Manufacture of cement, lime and plaster	2.758	0.241	0.294	-0.438	0.455	80.394	-14.149	-30.632	4.221	3.379	-2.179
152 Processing and preserving of fish and fish products	2.464	0.258	1.144	-0.030	0.018	39.858	-2.350	11.098	6.757	-2.500	-0.113

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext).

Graph A9.3: Sectoral R&D decomposition: Change in structure, R&D intensity and interaction between structure and intensity, NACE-2-digit level



1.10. France

Trade and industry specialisation

At the detailed manufacturing industry level, France is specialised in technology-driven (manufacture of air- and spacecraft) and marketing-driven industries (soaps and detergents, luggage and handbags). At the more aggregated sector level, France features export specialisation in medium-high innovation and education sectors (transport equipment – trains, aeroplanes...), while in value added France is specialised in medium innovation (air transport) and high education sectors (research and development, business services). The negative specialisation in high innovation sectors is due to machinery and computers. In addition France features high shares of technology exports to the BRIC countries, exploiting the growth potential there.

Export quality and sectoral R&D performance

France features high R&D intensity given its industrial structure and particularly good quality performance in labour-intensive industries, reflecting its luxury fashion industry similar to Italy. France is less high on the quality ladder in technology-driven industries. Overall, together with the UK, Belgium and the Netherlands, France is showing industry specialisation in high education sectors which are predominantly services.

Structural change

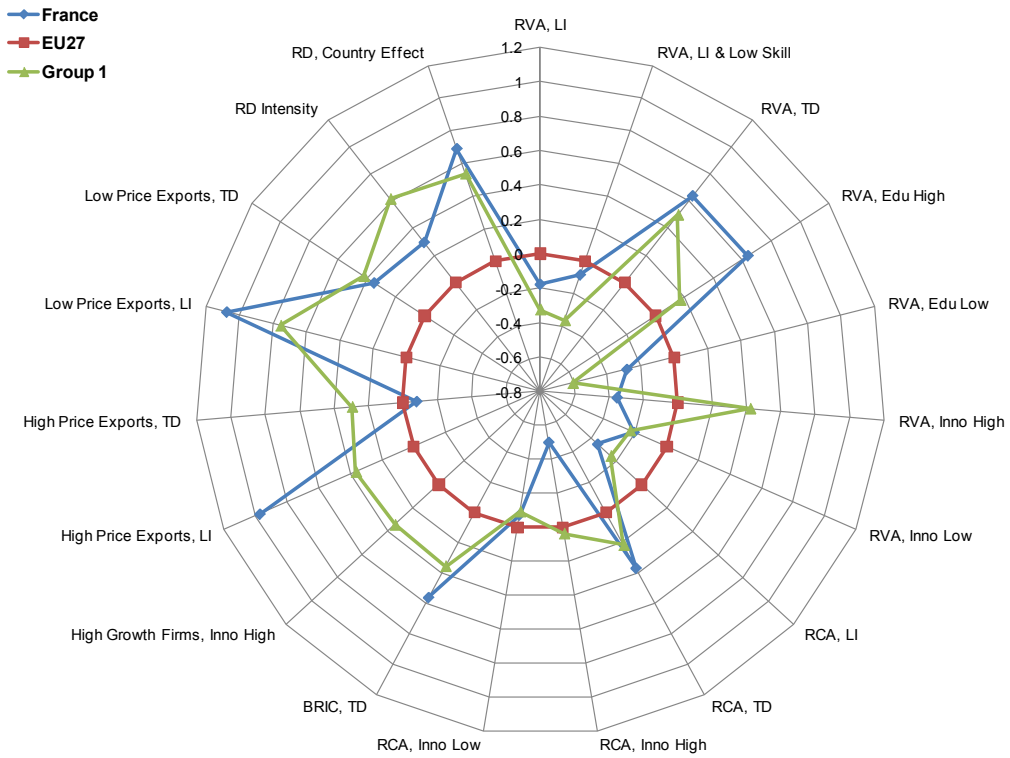
In terms of change, France considerably decreased its relative share of capital-intensive industries (cement, refined petroleum), while it increased its industry specialisation in technology-driven industries (air- and spacecraft). It decreased the relative share of the former industry type in exports (Radio and TV transmitters), and increased exports by marketing-driven industries (e.g., musical instruments). The relative share in high education (business services) increased considerably, the share in high innovation sectors decreased (computers, communication equipment). France climbed further up the quality ladder, in particular in labour-intensive industries, but decreased its R&D intensity taking account of its industrial structure. Sectoral R&D intensity fell in the chemicals, cars and transport equipment manufacturing sectors, while it increased in the services sectors business services and research and development.

Overall, France shows a favourable competitiveness position, with change dynamics partly positive but partly pointing to vulnerabilities in the export of knowledge-intensive manufacturing industries, mirrored by declining R&D activity.

Impact of the crisis

The impact of the crisis on the French industrial structure was limited overall, with the crisis favouring technology-driven industries and hitting capital-intensive as well as mainstream manufacturing industries.

Graph A10.1: Level



Graph A10.2: Change

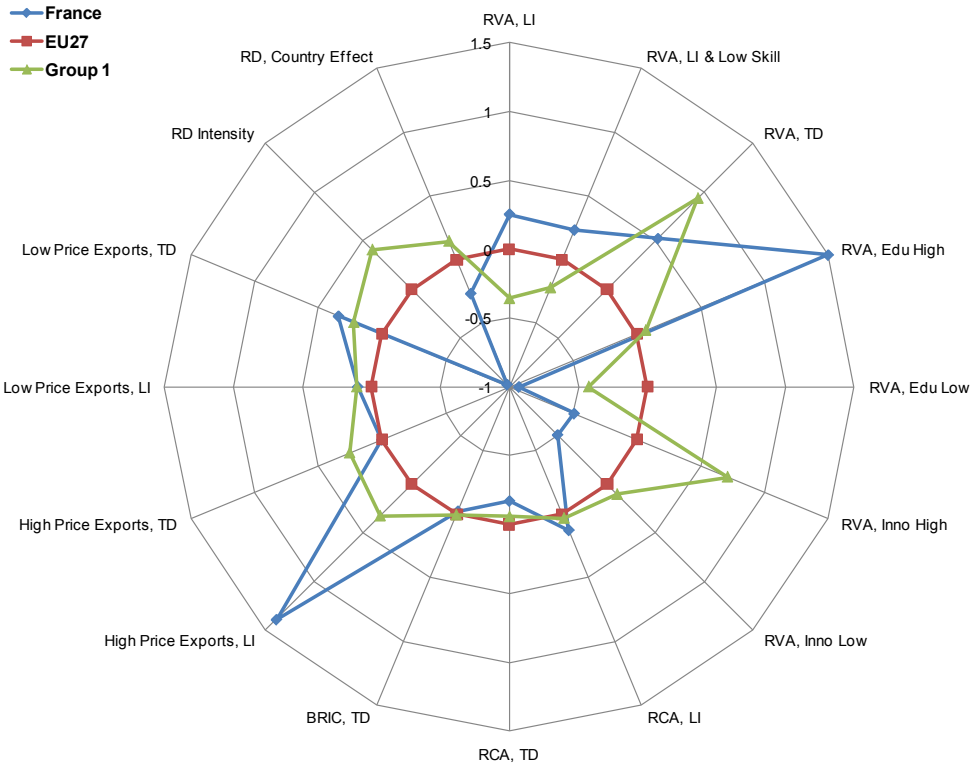


Table A10.1: Summary table - France

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2007	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
																Percentage points						
Factor inputs																						
Mainstream industries	-0.087	0.054									-0.171	-0.001	-0.050	1.207	0.658	0.128	35.684	18.232				
Labourintensive industries	-0.081	0.031									-0.287	0.090	0.028	0.430	0.242	0.040	52.533	18.156				
Capital intensive industries	-0.376	-0.334									-0.173	-0.051	-0.058	0.938	0.654	0.235	16.447	42.791				
Marketing driven industries	0.124	0.067									0.279	0.145	0.017	0.751	0.479	0.194	42.113	19.414				
Technology driven industries	0.228	0.040									0.144	-0.043	0.021	3.007	1.778	0.312	44.730	9.762				
Skill intensity																						
Low skill industries	0.052	0.024																				
Medium/blue collar workers	-0.082	-0.053																				
Medium/white collar workers	-0.029	-0.031																				
High skill industries	0.066	0.080																				
Labour intensive and low skill industries	-0.077	0.053																				
Revealed quality elasticity																						
High RQE	0.062	0.042									0.163	0.021	0.026	4.177	2.666	0.482	42.628	13.204				
Medium RQE	-0.025	-0.043									-0.105	0.019	0.000	1.146	0.624	0.237	32.515	27.809				
Low RQE	-0.058	-0.002									-0.231	-0.049	-0.066	1.011	0.522	0.190	29.721	29.678				
											2009	Change 2004/2009	Change 2007/2009									
INNOTYPE																						
High	-0.149	-0.076	8.333	-1.382	n.a.	-8.298	n.a.	3	0	0	-0.205	n.a.	-0.033						0.629	0.067	-0.073	0.195
Med-high	-0.030	-0.164	9.342	-2.292	n.a.	-8.905	n.a.	4	0	0	0.188	n.a.	0.023						0.483	0.064	-0.030	-0.337
Med	0.126	0.177	21.339	0.483	n.a.	-6.593	n.a.	5	1	0	-0.309	n.a.	0.040						0.032	-0.030	-0.002	-0.001
Med-low	-0.084	-0.242	7.051	-1.041	n.a.	-7.436	n.a.	4	0	0	0.187	n.a.	-0.050						0.302	0.143	-0.008	0.155
Low	-0.043	-0.094	13.207	0.188	n.a.	-8.213	n.a.	5	1	0	-0.078	n.a.	-0.035						0.032	0.012	-0.003	-0.001
EDUTYPE																						
High	0.169	0.192	22.301	1.057	n.a.	-6.158	n.a.	5	0	0	-0.665	n.a.	0.006									
Med-high	0.105	-0.103	7.220	-0.590	n.a.	-11.641	n.a.	3	0	0	0.214	n.a.	0.022									
Med	-0.109	0.015	38.994	0.490	n.a.	32.317	n.a.	2	-1	0	-0.113	n.a.	-0.031									
Med-low	0.091	-0.043	10.515	-0.655	n.a.	-7.197	n.a.	3	-1	0	-0.189	n.a.	-0.068									
Low	-0.059	-0.099	20.970	-0.302	n.a.	-7.082	n.a.	3	1	0	0.137	n.a.	0.011									
Total	0.000	0.000	100.000	0.000	n.a.	-0.113	n.a.	2	0	0	0.000	n.a.	0.000	6.334	3.812	0.909	36.963	20.898	1.498	0.256	-0.115	0.017

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A10.2: Selected Sectors I - France

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
353	Manufacture of aircraft and spacecraft	1.344
192	Manufacture of luggage, handbags and the like, saddlery	1.134
233	Nuclear fuel	1.098
159	Manufacture of beverages	0.952
335	Manufacture of watches and clocks	0.897
Top-3 sectors (NACE 2-digit)		
35	Transport equipment	1.087
15	Food and beverages	0.302
19	Leather, leather products and footwear	0.197

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
283	Manufacture of steam generators, except central heating hot water boilers	1.381
245	Manufacture of soap, detergents, cleaning, polishing	0.852
353	Manufacture of aircraft and spacecraft	0.791
192	Manufacture of luggage, handbags and the like, saddlery	0.758
335	Manufacture of watches and clocks	0.729
Top-3 sectors (NACE 2-digit)		
35	Transport equipment	0.429
62	Air transport	0.422
37	Recycling	0.417

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
362	Manufacture of jewellery and related articles	0.970
363	Manufacture of musical instruments	0.528
183	Dressing and dyeing of fur; manufacture of articles of fur	0.523
154	Manufacture of vegetable and animal oils and fats	0.461
293	Manufacture of agricultural and forestry machinery	0.454
266	Manufacture of articles of concrete, plaster, cement	-0.546
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	-0.576
283	Manufacture of steam generators, except central heating hot water boilers	-0.616
323	Manuf. of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	-0.822
231	Coke oven products	-1.351
The 3 winning and 3 losing sectors (NACE 2-digit)		
19	Leather, leather and footwear	0.633
18	Wearing apparel, dressing and dyeing of fur	0.352
16	Tobacco products	0.220
34	Motor vehicles, trailers and semi-trailers	-0.101
32	Radio, television and communication equipment	-0.314
30	Office, accounting and computing machinery	-0.495

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
264	Manufacture of bricks, tiles and construction products	0.576
353	Manufacture of aircraft and spacecraft	0.542
245	Manufacture of soap, tergents, cleaning, polishing	0.524
351	Building and repairing of ships and boats	0.433
363	Manufacture of musical instruments	0.340
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	-0.443
154	Manufacture of vegetable and animal oils and fats	-0.491
355	Manufacture of other transport equipment n.e.c.	-0.968
30	Manufacture of office machinery and computers	-1.081
23	Manufacture of coke, refined petroleum products and nuclear fuel	-1.392
The 3 winning and 3 losing sectors (NACE 2-digit)		
70	Real estate activities	0.577
62	Air transport	0.530
73	Research and development	0.286
30	Office, accounting and computing machinery	-1.156
23	Coke, refined petroleum and nuclear fuel	-1.516
16	Tobacco products	-2.770

Source: Eurostat (SBS, Comext).

Table A10.3: Selected Sectors II - France

Revealed comparative advantage (RCA)

		RCA (export)			Export shares in price segments					
					Low			High		
		2010	Change 1999/2010	Change 2007/2010	2009 in %	Change 1999/2009	Change 2007/2009	2009 in %	Change 1999/2009	Change 2007/2009
Top-5 industries (NACE 3-digit)						in percentage points			in percentage points	
353	Manufacture of aircraft and spacecraft	1.344	0.043	-0.042	1.524	-0.214	-0.183	43.388	-23.408	-20.841
192	Manufacture of luggage, handbags and the like, saddler	1.134	0.426	0.159	0.654	-3.410	-0.067	93.673	15.996	2.851
233	Nuclear fuel	1.098	0.187	0.272	85.673	82.345	12.695	0.944	-85.105	-8.747
159	Manufacture of beverages	0.952	0.087	0.005	8.949	-10.553	-1.836	77.522	28.291	6.957
335	Manufacture of watches and clocks	0.897	0.433	0.021	2.363	-2.083	0.241	90.388	30.336	3.210

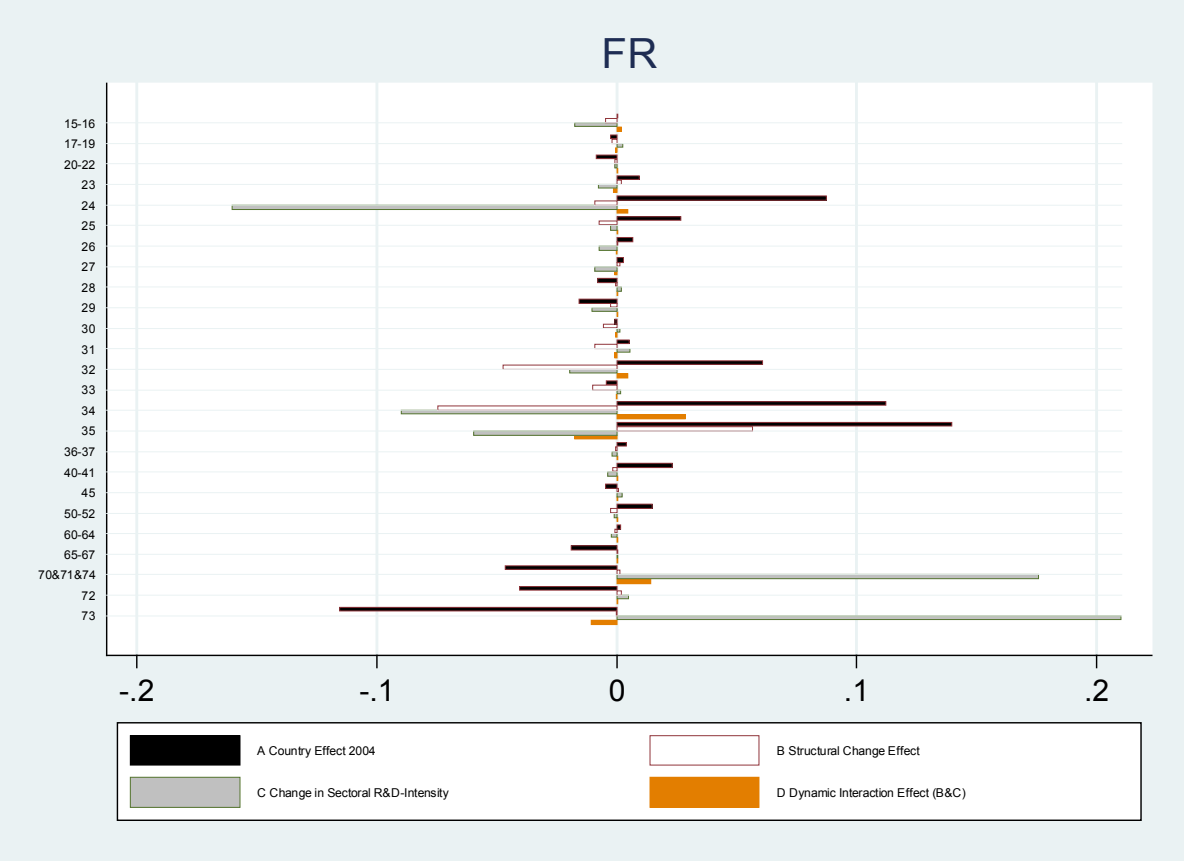
Relative value added (RVA)

		RVA		RCA (export)			Export shares in price segments					
							Low			High		
		2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Change 1999/2007	Change 2007/2009	2007	Change 1999/2007	Change 2007/2009
Top-5 industries (NACE 3-digit)								in percentage points			in percentage points	
283	Manufacture of steam generators, except central heating hot water boilers	3.980	0.269	0.153	-0.414	-0.201	23.881	17.527	-18.654	52.352	27.027	-11.071
245	Manufacture of soap, detergents, cleaning, polishing	2.344	0.504	0.888	0.174	-0.017	14.533	-3.120	5.043	46.676	-2.214	1.252
353	Manufacture of aircraft and spacecraft	2.206	0.668	1.386	0.086	-0.042	1.707	-0.031	-0.183	64.229	-2.567	-20.841
192	Manufacture of luggage, handbags and the like, saddler	2.135	0.290	0.975	0.267	0.159	0.722	-3.343	-0.067	90.822	13.145	2.851
335	Manufacture of watches and clocks	2.072	0.148	0.875	0.412	0.021	2.122	-2.324	0.241	87.178	27.126	3.210

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext).

Graph A10.3: Sectoral R&D decomposition: Change in structure, R&D intensity and interaction between structure and intensity, NACE-2-digit level



1.11. Italy

At the detailed manufacturing industry level, Italy is specialised in labour-intensive (leather clothes, cutting and shaping of stone), in mainstream manufacturing industries (fabricated metal products, domestic appliances, motorcycles and bicycles) and in addition in exports it is specialised in marketing-driven industries (tanning and dressing of leather, luggage and handbags). At the more aggregated sector level, Italy is specialised in low education and innovation sectors (leather, wearing apparel), but also in highly innovation-intensive sectors such as machinery. Its relative share in high education sectors is low due to software, business services and research and development. Italy shows very low shares of exports to the BRIC countries, indicating unused growth potential. Its share of high growth firms in highly innovative sectors is low, in line with its group of higher income countries specialised in labour-intensive industries.

Export quality and sectoral R&D performance

Italy's position on the quality ladder is very high in labour-intensive industries, while in technology-driven industries it is below the EU average. Its R&D intensity is below average given its industrial structure. Overall, Italy shows how specialisation in labour-intensive industries can be sustained when sectoral upgrading, e.g. through climbing up the quality ladder, takes place.

Structural change

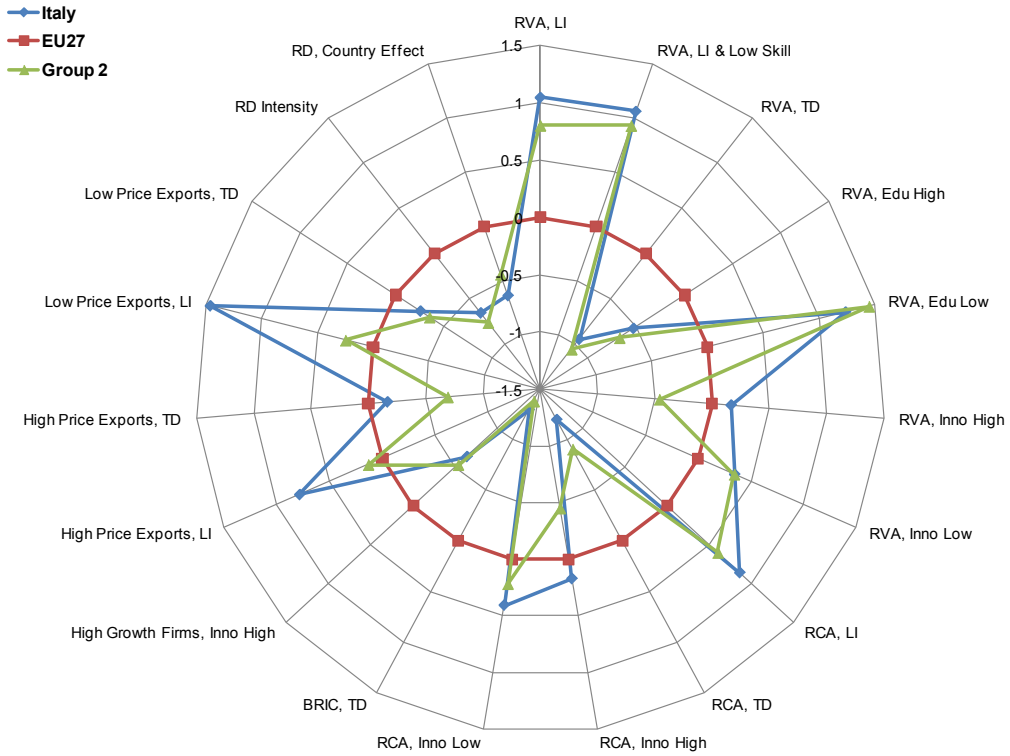
In terms of change, Italy's changing specialisation patterns are quite complex, with opposite directions in trade and industry specialisation: while it decreased the relative shares of capital-intensive industries in value added (ceramic tiles), it increased them in exports (basic non-ferrous metals), along with other industry types (e.g., technology-driven industries – TV and radio transmitters) with the exception of labour-intensive industries (leather clothes). The same holds true for high innovation sectors (increasing in value added – e.g. medical, precision instruments - , decreasing in trade) and vice versa for high education sectors (increasing – financial services).

Italy improved its sectoral R&D intensity and was stable on the quality ladder (gaining in the high quality segment of technology industries, but also in the low quality segment). Overall, Italy shows a mixed picture with respect to competitiveness. While it undoubtedly features strengths and improvements in some areas, its overall outlook is impaired by its performance in knowledge-intensive industries and the statistics do not unequivocally point in the direction of improving competitiveness.

Impact of the crisis

The impact of the crisis on Italy's industrial structure was limited overall, favouring somewhat marketing-driven industries.

Graph A11.1: Level



Graph A11.2: Change

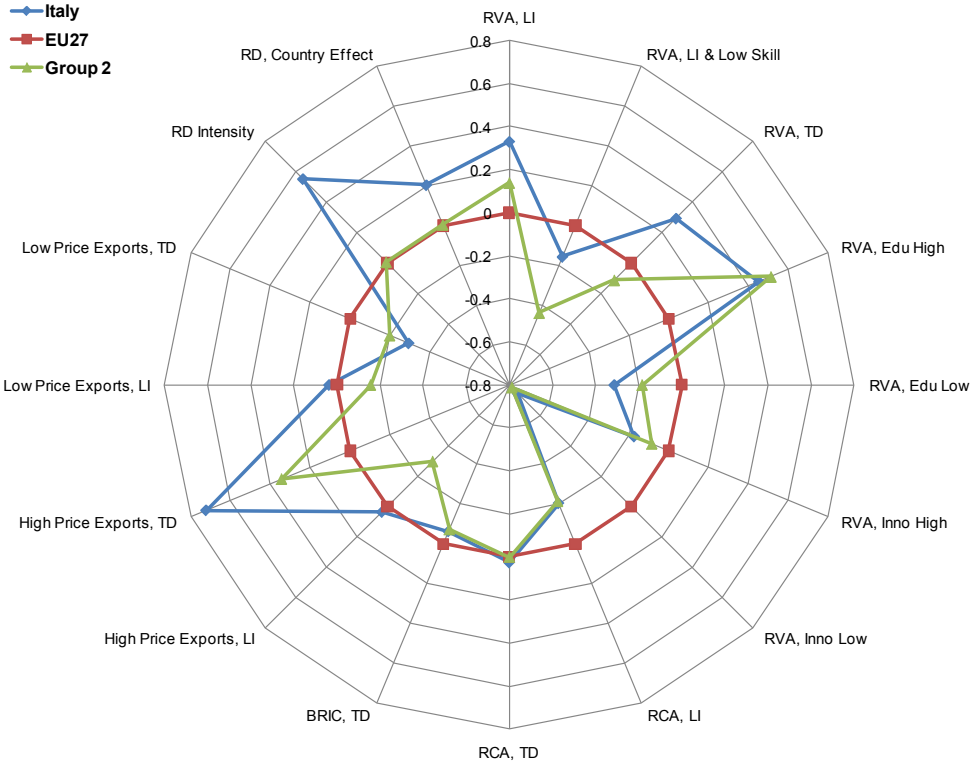


Table A11.1: Summary table - Italy

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2007	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
Factor inputs																						
Mainstream industries	0.166	-0.019									0.441	0.015	0.006	3.270	1.965	0.576	16.503	35.505				
Labourintensive industries	0.374	0.026									0.482	-0.063	0.002	1.315	0.718	0.060	49.373	16.264				
Capital intensive industries	-0.301	-0.162									-0.139	0.118	0.042	0.995	0.590	0.245	15.779	51.767				
Marketing driven industries	-0.084	0.024									0.171	0.019	0.026	0.740	0.439	0.083	33.870	27.329				
Technology driven industries	-0.478	0.046									-0.708	0.015	0.012	0.882	0.401	0.194	42.922	24.509				
Skill intensity																						
Low skill industries	0.155	-0.060																				
Medium/blue collar workers	0.070	0.069																				
Medium/white collar workers	-0.266	0.029																				
High skill industries	-0.018	-0.059																				
Labour intensive and low skill industries	0.654	-0.017																				
Revealed quality elasticity																						
High RQE	-0.065	-0.041									-0.002	-0.037	-0.019	4.314	2.345	0.764	36.076	23.851				
Medium RQE	0.139	0.043									0.078	0.048	0.012	1.675	0.982	0.314	21.740	38.599				
Low RQE	-0.123	-0.004									-0.080	0.028	0.019	1.214	0.786	0.080	20.119	41.828				
											2009	Change 2004/2009	Change 2007/2009									
INNOTYPE																						
High	0.064	-0.022	8.778	0.138	-0.195	-1.161	-0.499	4	1	-	0.062	0.043	0.012						0.270	-0.419	0.006	-0.015
Med-high	0.022	-0.089	10.725	-1.545	-0.139	-0.803	-0.962	5	0	0	-0.073	0.030	0.001						0.238	-0.162	0.002	0.024
Med	0.041	0.060	19.207	0.072	-0.313	0.250	-0.502	4	0	0	-0.064	-0.097	-0.060						0.036	-0.057	0.002	0.006
Med-low	-0.135	-0.123	6.851	0.025	-0.081	-0.525	-0.524	2	-1	+	-0.082	0.070	0.097						0.106	-0.075	-0.001	0.067
Low	0.068	-0.122	16.392	-0.642	-0.202	0.141	-0.364	3	1	0	0.351	-0.128	-0.007						0.027	0.004	-0.001	0.008
EDUTYPE																						
High	-0.165	0.077	15.901	0.511	-0.315	0.264	-0.157	5	0	0	-0.928	-0.088	-0.109									
Med-high	-0.204	-0.044	6.286	0.433	-0.210	1.424	-0.594	5	1	-	-0.374	0.025	-0.039									
Med	-0.093	0.039	39.231	1.490	-0.238	-0.565	-0.386	2	0	0	0.206	0.101	0.065									
Med-low	0.035	-0.096	11.829	-2.315	-0.279	-0.567	-0.299	1	0	0	0.038	-0.177	-0.043									
Low	0.224	-0.026	26.753	-0.119	-0.214	0.350	-0.569	4	-1	0	0.364	0.012	0.047									
Total	0.000	0.000	100.000	0.000	-0.255	0.000	-0.428	2	1	0	0.000	0.000	0.000	7.202	4.113	1.158	27.514	33.048	0.684	-0.720	0.008	0.093

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A11.2: Selected Sectors I - Italy

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
191	Tanning and dressing of leather	1.820
263	Manufacture of ceramic tiles and flags	1.705
267	Cutting, shaping and finishing of stone	1.589
181	Manufacture of leather clothes	1.414
172	Textile weaving	1.218
Top-3 sectors (NACE 2-digit)		
19	Leather, leather products and footwear	1.258
17	Textiles and textile products	0.782
18	Wearing apparel, dressing and dyeing of fur	0.722

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
191	Tanning and dressing of leather	1.606
181	Manufacture of leather clothes	1.577
193	Manufacture of footwear	1.370
192	Manufacture of luggage, handbags and the like, saddlery	1.232
263	Manufacture of ceramic tiles and flags	1.216
Top-3 sectors (NACE 2-digit)		
19	Leather, leather products and footwear	1.542
18	Wearing apparel, dressing and dyeing of fur	1.091
17	Textiles and textile products	0.981

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
283	Manufacture of steam generators, except central heating hot water boilers	1.019
183	Dressing and dyeing of fur; manufacture of articles of fur	0.582
274	Manufacture of basic precious and non-ferrous metals	0.467
155	Manufacture of dairy products	0.438
231	Coke oven products	0.429
342	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers	-0.500
323	Manuf. of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	-0.516
300	Manufacture of office machinery and computers	-0.565
365	Manufacture of games and toys	-0.845
233	Nuclear fuel	-2.007
The 3 winning and 3 losing sectors (NACE 2-digit)		
23	Coke, refined petroleum and nuclear fuel	0.414
27	Basic metals	0.329
21	Pulp, paper and paperboard	0.255
32	Radio, television and communication equipment	-0.194
36	Furniture, jewellery, musical instruments, sports goods, games and toys	-0.252
30	Office, accounting and computing machinery	-0.565

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
181	Manufacture of leather clothes	1.210
177	Manufacture of knitted and crocheted articles	0.791
351	Building and repairing of ships and boats	0.517
364	Manufacture of sports goods	0.465
193	Manufacture of footwear	0.460
355	Manufacture of other transport equipment n.e.c.	-0.405
263	Manufacture of ceramic tiles and flags	-0.414
247	Manufacture of man-made fibres	-0.527
152	Processing and preserving of fish and fish products	-0.607
183	Dressing and dyeing of fur; manufacture of articles of fur	-0.626
The 3 winning and 3 losing sectors (NACE 2-digit)		
62	Air transport	0.388
41	Water supply	0.320
18	Wearing apparel, dressing and dyeing of fur	0.272
60	Inland transport	-0.204
40	Electricity and gas	-0.250
23	Coke, refined petroleum and nuclear fuel	-0.497

Source: Eurostat (SBS, Comext).

Table A11.3: Selected Sectors II - Italy

Revealed comparative advantage (RCA)

	RCA (export)			Export shares in price segments					
					Low			High	
	2010	Change 1999/2010	Change 2007/2010	2009 in %	Change 1999/2009	Change 2007/2009	2009 in %	Change 1999/2009	Change 2007/2009
Top-5 industries (NACE 3-digit)					in percentage points			in percentage points	
191 Tanning and dressing of leather	1.820	0.226	0.052	42.339	24.821	-3.551	16.535	-18.303	-2.304
263 Manufacture of ceramic tiles and flags	1.705	0.029	0.062	6.215	-0.219	1.996	37.484	25.248	10.861
267 Cutting, shaping and finishing of stone	1.589	-0.107	-0.020	18.434	0.783	5.267	40.715	11.963	-5.541
181 Manufacture of leather clothes	1.414	0.335	0.099	0.117	-2.700	0.026	98.989	2.553	-0.569
172 Textile weaving	1.218	0.267	0.049	9.370	3.631	0.849	47.352	-12.435	-3.709

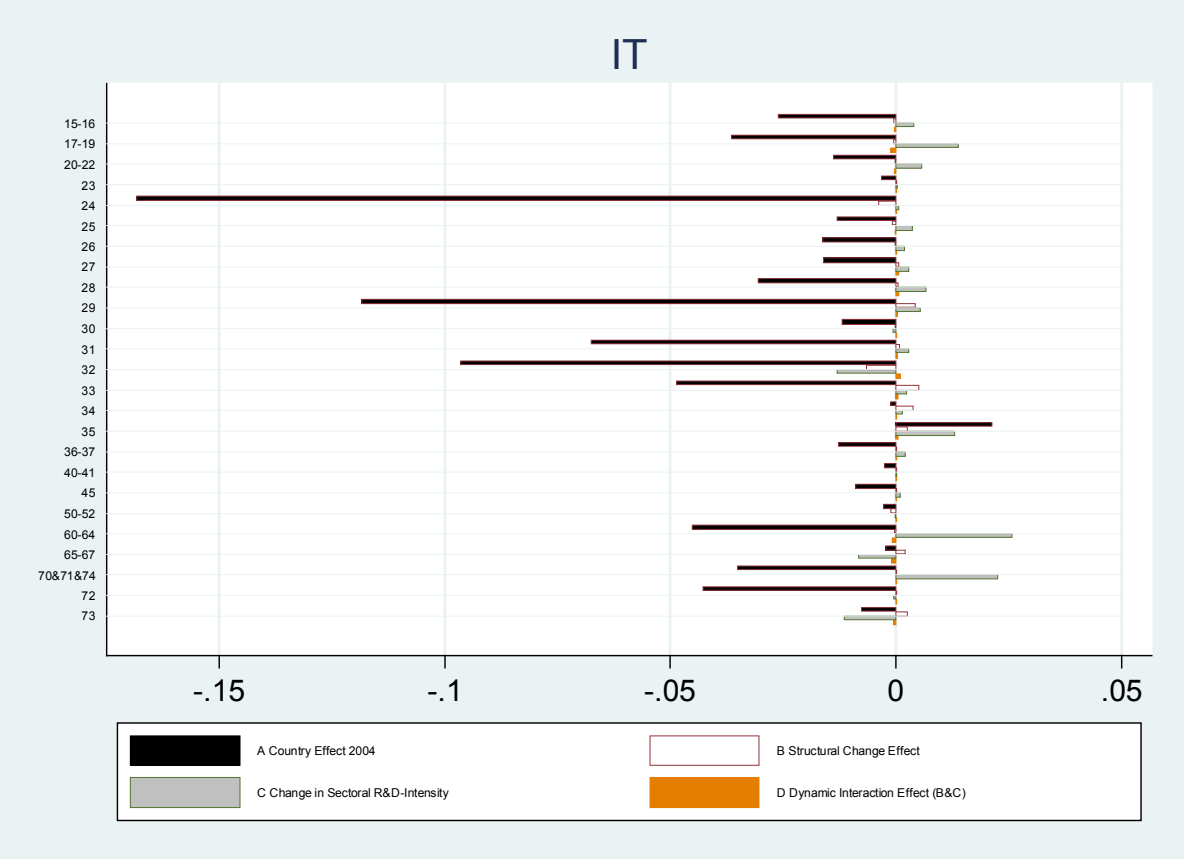
Relative value added (RVA)

	RVA		RCA (export)			Export shares in price segments				
							Low			High	
	2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Change 1999/2007	Change 2007/2009	2007	Change 1999/2007	Change 2007/2009
Top-5 industries (NACE 3-digit)							in percentage points			in percentage points	
191 Tanning and dressing of leather	4.983	0.650	1.768	0.174	0.052	45.890	28.372	-3.551	18.839	-15.999	-2.304
181 Manufacture of leather clothes	4.840	1.851	1.315	0.236	0.099	0.091	-2.726	0.026	99.558	3.122	-0.569
193 Manufacture of footwear	3.934	0.312	1.179	-0.062	-0.041	3.899	-0.778	1.927	69.132	33.607	2.323
192 Manufacture of luggage, handbags and the like, saddler	3.429	0.552	1.102	0.154	0.008	1.289	-2.361	0.175	90.621	-3.372	-0.236
263 Manufacture of ceramic tiles and flags	3.373	-0.471	1.643	-0.033	0.062	4.219	-2.214	1.996	26.623	14.388	10.861

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext).

Graph A11.3: Sectoral R&D decomposition: Change in structure, R&D intensity and interaction between structure and intensity, NACE-2-digit level



1.12. Cyprus

Trade and industry specialisation

At the detailed manufacturing industry level, Cyprus features specialisation in marketing-driven industries (processing and preserving of fish, fruit, manufacture of vegetable oils, dairy products etc.), value added specialisation in labour-intensive industries (bricks and tiles) and export specialisation in technology-driven industries (electronic valves). However, the share of manufacturing in Cyprus is very small, and exports of manufactured goods even smaller, so that (manufacturing) export indicators should be interpreted with care. At the more aggregated sector level, Cyprus is specialised in low innovation and education sectors such as tobacco, water transport and hotels and restaurants. The export specialisation in high education sectors is due to financial services.

Export quality and sectoral R&D performance

Given its industrial structure, Cyprus' R&D intensity is (slightly) below average, as is its position on the quality ladder. It is closer to the average in technology-driven industries than in labour-intensive industries.

Structural change

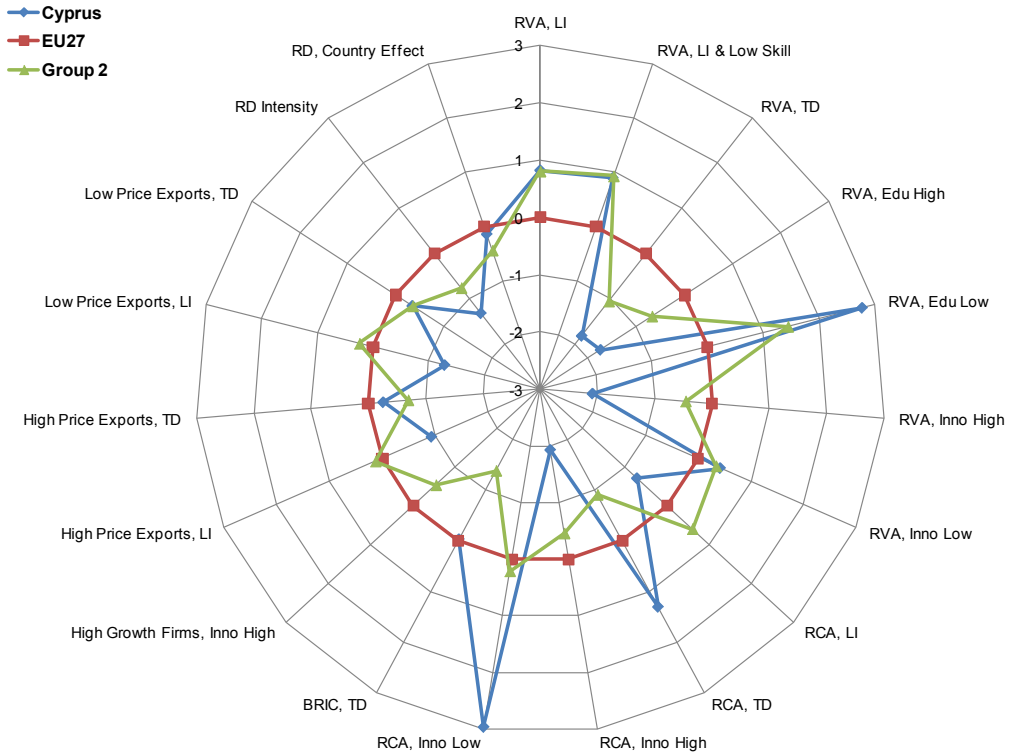
In terms of change, Cyprus considerably increased its trade specialisation in technology-driven industries (electronic valves, air- and spacecraft and medical equipment) and its relative shares in high education and innovation sectors (radio, TV and communication equipment), while it decreased its specialisation in the low innovation and education sectors (water transport, hotels and restaurants) as well as in exports of labour-intensive industries. Cyprus is stagnant on its sectoral R&D intensity, and the quality indicators paint a mixed picture. There are improvements in the high quality segment but also the low quality segments gain a larger share.

Overall, Cyprus is clearly catching up with respect to competitiveness in terms of specialisation; however the indicators referring to sectoral upgrading such as R&D and quality show that Cyprus needs to move further up the value chain.

Impact of the crisis

In Cyprus, the crisis clearly held back the structural change towards technology-driven industries, while leading to higher shares of capital-intensive and marketing-driven industries.

Graph A12.1: Level



Graph A12.2: Change

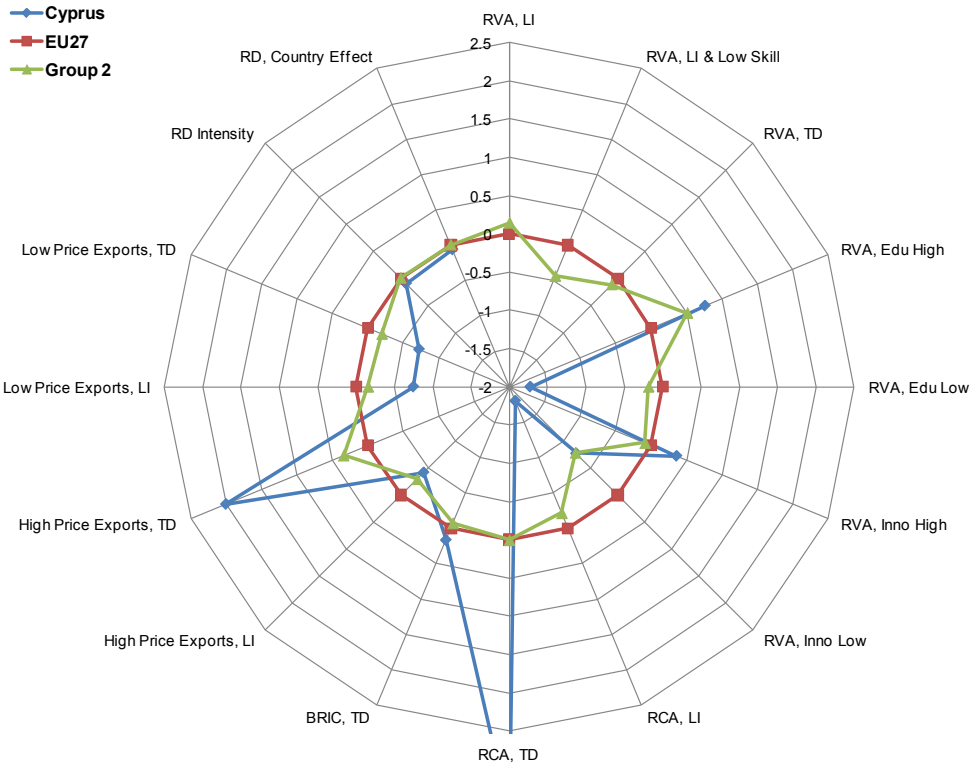


Table A12.1: Summary table - Cyprus

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2007	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
													Percentage points									
Factor inputs																						
Mainstream industries	-0.282	n.a.									-0.917	-0.868	-0.461	0.730	-0.496	0.452	26.063	62.414				
Labourintensive industries	0.303	n.a.									-0.718	-1.065	0.013	0.226	0.065	0.015	20.491	62.144				
Capital intensive industries	-0.206	n.a.									-0.432	-0.460	0.358	1.741	1.617	0.745	28.927	56.353				
Marketing driven industries	0.603	n.a.									0.444	-0.261	0.166	0.207	-0.061	-0.052	55.882	32.559				
Technology driven industries	-1.309	n.a.									0.441	1.126	-0.081	2.331	1.904	1.041	40.890	31.551				
Skill intensity																						
Low skill industries	0.703	n.a.																				
Medium/blue collar workers	-0.142	n.a.																				
Medium/white collar workers	-0.744	n.a.																				
High skill industries	-1.114	n.a.																				
Labour intensive and low skill industries	0.575	n.a.																				
Revealed quality elasticity																						
High RQE	-0.489	n.a.									0.195	0.191	-0.161	3.167	2.025	1.415	52.780	22.895				
Medium RQE	0.161	n.a.									-0.185	-0.126	0.296	0.132	-0.117	-0.096	16.980	68.640				
Low RQE	0.270	n.a.									-0.230	-0.286	0.215	1.936	1.122	0.881	24.602	57.535				
											2009	Change 2004/2009	Change 2007/2009									
INNOTYPE																						
High	-1.721	0.329	0.497	-0.088	-1.703	22.543	n.a.	5	0	0	-1.251	-0.482	-0.362						0.051	-0.030	0.003	0.011
Med-high	-0.550	-0.101	14.056	0.193	-1.931	6.340	n.a.	1	0	0	-1.681	-0.295	-0.267						0.024	-0.099	-0.003	0.006
Med	-0.468	-0.052	15.116	1.258	-1.866	15.332	n.a.	1	-2	0	1.133	0.176	0.074						0.005	-0.058	0.000	0.002
Med-low	0.032	-0.050	5.467	-2.666	-1.459	-4.758	n.a.	5	0	0	-0.761	-0.351	-0.302						0.024	-0.131	-0.002	0.004
Low	0.082	-0.124	14.106	-1.064	-2.056	3.642	n.a.	4	0	0	1.401	-0.090	0.054						0.003	-0.024	0.000	0.002
EDUTYPE																						
High	-0.695	0.237	7.710	1.167	-1.690	28.099	n.a.	1	0	0	1.014	0.367	0.260									
Med-high	-1.045	-0.377	12.456	1.892	-2.759	6.832	n.a.	4	0	0	-0.754	-0.265	-0.430									
Med	-0.079	0.124	33.128	1.420	-1.600	15.815	n.a.	3	1	0	-2.160	-0.185	-0.413									
Med-low	0.077	0.003	15.640	-1.079	-1.232	-5.452	n.a.	2	0	0	0.873	0.139	0.228									
Low	0.445	-0.111	31.065	-3.400	-1.056	-5.442	n.a.	4	1	0	0.048	-0.383	-0.220									
Total	0.000	0.000	100.000	0.000	-1.226	0.000	n.a.	3	0	0	0.000	0.000	0.000	5.234	3.030	2.200	40.106	38.869	0.114	-0.357	-0.002	0.029

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A12.2: Selected Sectors I - Cyprus

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
296	Manufacture of weapons and ammunition	2.433
321	Manufacture of electronic valves and tubes and other electronic components	1.961
155	Manufacture of dairy products	1.916
160	Manufacture of tobacco products	1.808
335	Manufacture of watches and clocks	1.515
Top-3 sectors (NACE 2-digit)		
16	Tobacco	1.808
32	Radio, television and communication equipment	0.909
33	Medical, precision and optical instruments	0.733

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
264	Manufacture of bricks, tiles and construction products	1.930
265	Manufacture of cement, lime and plaster	1.911
203	Manufacture of builders' carpentry and joinery	1.831
274	Manufacture of basic precious and non-ferrous metals	1.798
267	Cutting, shaping and finishing of stone	1.719
Top-3 sectors (NACE 2-digit)		
61	Water transport	1.327
55	Hotels and restaurants	1.298
62	Air transport	0.961

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
160	Manufacture of tobacco products	5.820
321	Manufacture of electronic valves and tubes and other electronic components	5.291
353	Manufacture of aircraft and spacecraft	4.059
331	Manufacture of medical and surgical equipment and orthopaedic appliances	3.072
247	Manufacture of man-made fibres	2.806
268	Manufacture of other non-metallic mineral products	-4.749
273	Other first processing of iron and steel and production of non-ECSC ferro-alloys	-4.969
266	Manufacture of articles of concrete, plaster, cement	-5.465
191	Tanning and dressing of leather	-6.742
232	Refined petroleum products	-6.871
The 3 winning and 3 losing sectors (NACE 2-digit)		
16	Tobacco products	5.820
32	Radio, television and communication equipment	3.244
35	Transport equipment	2.571
18	Wearing apparel, dressing and dyeing of fur	-1.861
26	Non-metallic mineral products	-2.673
23	Coke, refined petroleum and nuclear fuel	-6.714

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
	n.a.	n.a.
	n.a.	n.a.
	n.a.	n.a.
	n.a.	n.a.
	n.a.	n.a.
	n.a.	n.a.
	n.a.	n.a.
	n.a.	n.a.
	n.a.	n.a.
	n.a.	n.a.
The 3 winning and 3 losing sectors (NACE 2-digit)		
70	Real estate activities	1.035
37	Recycling	0.778
26	Non-metallic mineral products	0.534
61	Water transport	-1.177
18	Wearing apparel, dressing and dyeing of fur	-1.259
55	Hotels and restaurants	-1.762

Source: Eurostat (SBS, Comext).

Table A12.3: Selected Sectors II - Cyprus

Revealed comparative advantage (RCA)

	RCA (export)			Export shares in price segments					
					Low			High	
	2010	Change 1999/2010	Change 2007/2010	2009 in %	Change 1999/2009	Change 2007/2009	2009 in %	Change 1999/2009	Change 2007/2009
Top-5 industries (NACE 3-digit)					in percentage points			in percentage points	
296 Manufacture of weapons and ammunition	2.433	-0.480	-0.211	77.899	2.120	9.547	8.295	8.295	8.295
321 Manufacture of electronic valves and tubes and other electronic components	1.961	5.291	0.552	86.255	86.255	86.255	0.000	0.000	0.000
155 Manufacture of dairy products	1.916	0.498	0.252	1.122	-1.413	-0.163	97.156	26.793	1.626
160 Manufacture of tobacco products	1.808	5.820	0.421	72.584	72.584	59.974	27.192	27.192	20.359
335 Manufacture of watches and clocks	1.515	1.710	1.682	20.747	20.747	20.747	0.000	0.000	0.000

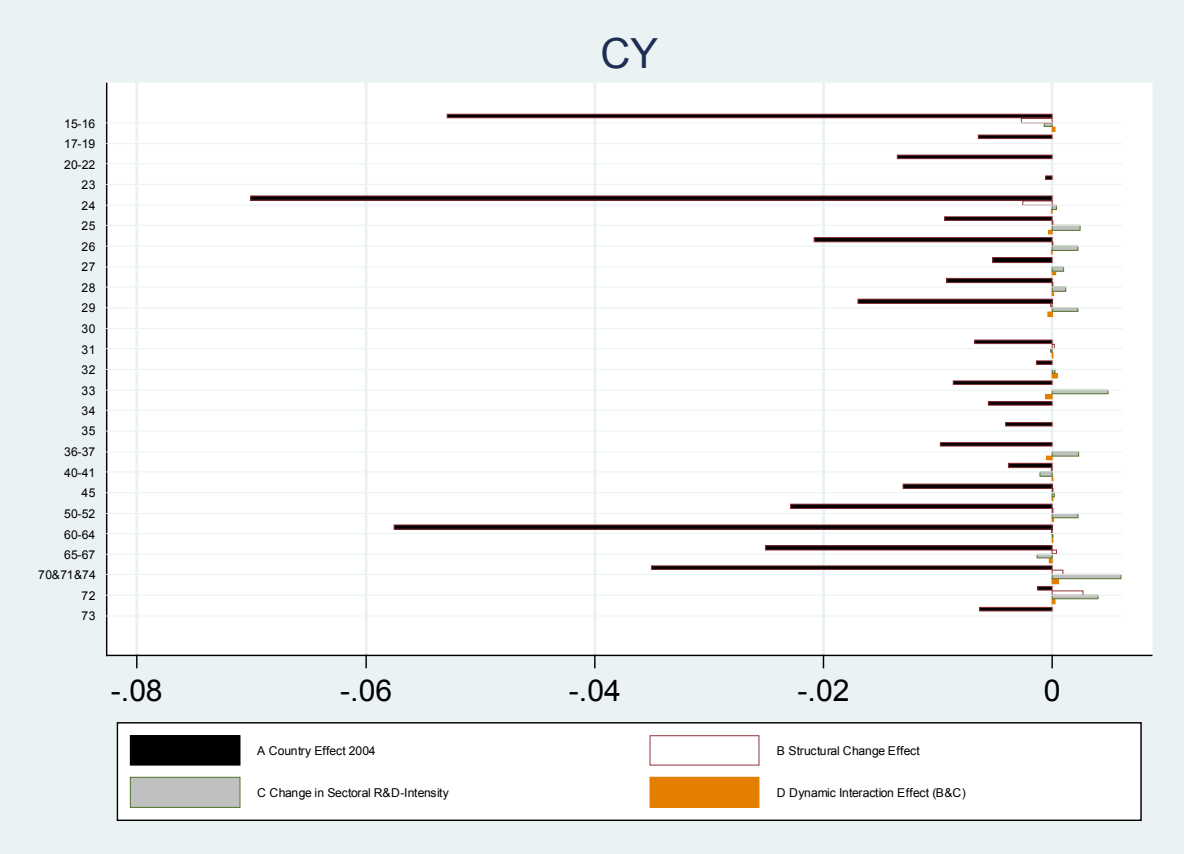
Relative value added (RVA)

	RVA		RCA (export)			Export shares in price segments					
							Low			High	
	2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Change 1999/2007	Change 2007/2009	2007	Change 1999/2007	Change 2007/2009
Top-5 industries (NACE 3-digit)							in percentage points			in percentage points	
264 Manufacture of bricks, tiles and construction products	-	-	-2.735	-2.923	-	0.000	-87.207	0.000	0.000	0.000	0.000
265 Manufacture of cement, lime and plaster	-	-	1.341	-2.505	-1.457	100.000	40.547	0.000	0.000	0.000	0.000
203 Manufacture of builders' carpentry and joinery	-	-	-1.204	-0.886	0.892	0.000	0.000	2.084	100.000	0.000	-2.084
274 Manufacture of basic precious and non-ferrous metals	-	-	0.783	-0.143	-0.082	62.271	-14.155	-14.937	19.318	8.328	4.247
267 Cutting, shaping and finishing of stone	-	-	-1.031	-1.679	-0.491	5.879	-48.345	73.235	50.695	6.267	-36.009

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext).

Graph A12.3: Sectoral R&D decomposition: Change in structure, R&D intensity and interaction between structure and intensity, NACE-2-digit level



1.13. Latvia

Trade and industry specialisation

At the detailed manufacturing industry level, Latvia is specialised in labour-intensive (sawmilling and planing of wood, manufacture of veneer sheets, wooden containers...) and marketing-driven industries (processing and preserving of fish). At the more aggregated sector level, Latvia features specialisation in low and medium-low innovation and education sectors (wood and products of wood, food, inland transport). Its share of high growth firms indicates that Latvia is catching up, while the high share of exports to the BRIC countries reflects Latvia's past as a member of the former Soviet Union.

Export quality and sectoral R&D performance

Latvia's R&D intensity is below average given its industrial structure, however higher than the average of its group of lower income countries specialised in labour-intensive industries. The same holds true for Latvia's position on the quality ladder, which is generally below the average but above its group average, and in the low quality segment on a par with the EU average.

Structural change

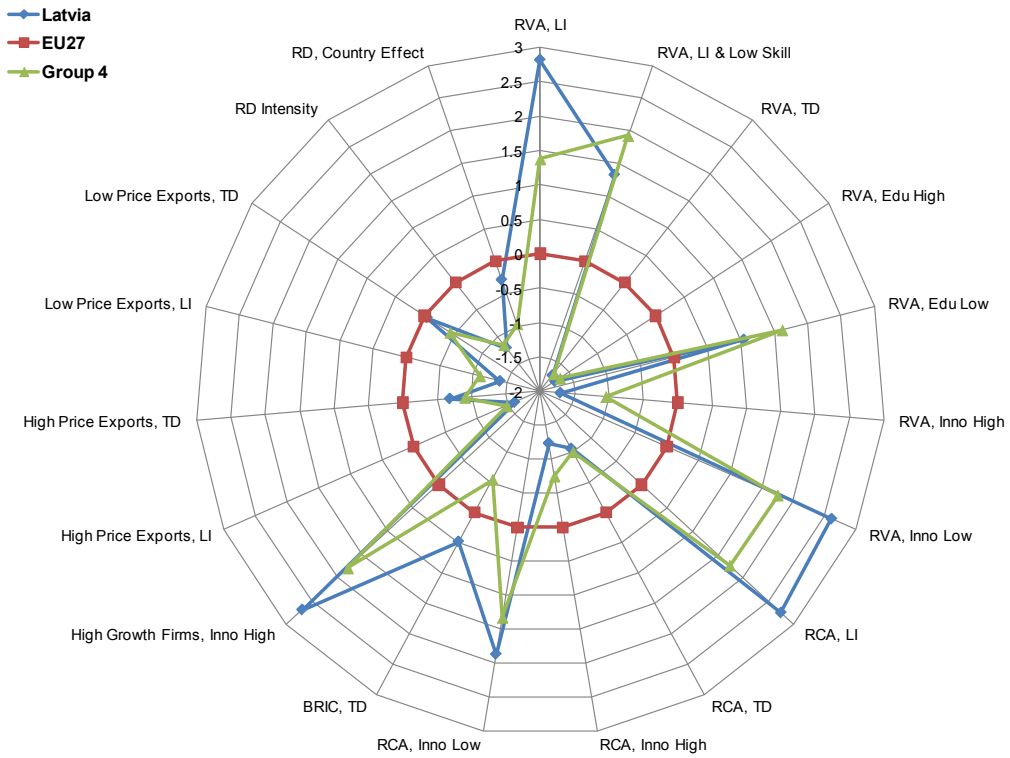
In terms of change, Latvia displays an unequivocal move towards knowledge-intensive industries: it considerably increased its relative share in exports of technology-driven industries (motor vehicles, radio and TV receivers), and its relative shares of high innovation and high education sectors (communication equipment, computers), while it decreased trade specialisation in labour-intensive industries and specialisation in low innovation sectors (wearing apparel, auxiliary transport). It improved its position on the quality ladder, with the exception of the change in the share of exports in the low price segment of technology-driven industries, which decreased in Latvia relative to the EU. Latvia's sectoral R&D intensity remains unchanged relative to the EU.

Overall, Latvia is catching up with respect to competitiveness, both in terms of specialisation (clearly so) and in terms of sectoral upgrading (a bit less clearly).

Impact of the crisis

The impact of the crisis on Latvia's economic structure seems to have been limited, favouring capital-intensive industries against the trend.

Graph A13.1: Level



Graph A13.2: Change

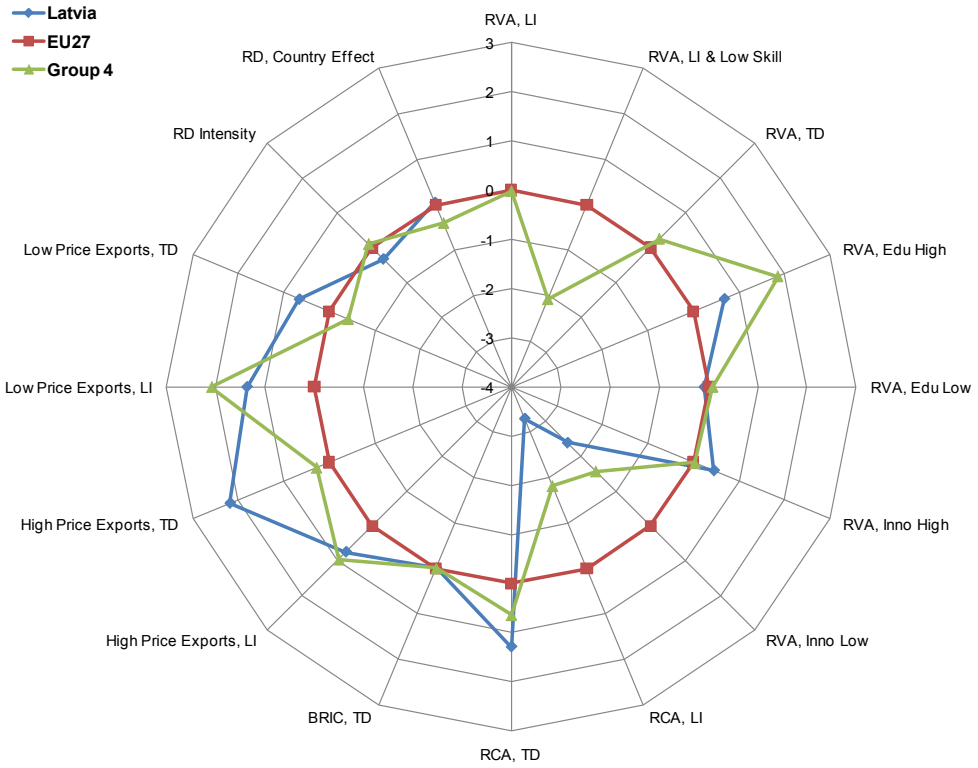


Table A13.1: Summary table - Latvia

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2007	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
																Percentage points						
Factor inputs																						
Mainstream industries	-0.361	n.a.									-0.261	0.417	0.051	5.096	3.266	0.647	24.361	45.527				
Labourintensive industries	0.798	n.a.									1.090	-0.452	-0.101	2.835	1.568	-0.121	9.360	70.579				
Capital intensive industries	-1.327	n.a.									-0.152	-0.147	0.038	2.102	1.140	0.286	14.413	66.383				
Marketing driven industries	0.388	n.a.									0.350	0.511	0.026	5.872	3.807	2.527	20.309	57.314				
Technology driven industries	-1.150	n.a.									-0.590	1.140	0.169	2.916	1.850	0.789	31.661	16.129				
Skill intensity																						
Low skill industries	0.409	n.a.																				
Medium/blue collar workers	0.333	n.a.																				
Medium/white collar workers	-0.681	n.a.																				
High skill industries	-0.936	n.a.																				
Labour intensive and low skill industries	0.766	n.a.																				
Revealed quality elasticity																						
High RQE	-0.423	n.a.									-0.320	0.375	-0.024	10.063	7.566	2.217	27.824	36.821				
Medium RQE	0.104	n.a.									-0.153	-0.033	-0.036	4.122	0.941	0.717	19.173	49.241				
Low RQE	0.294	n.a.									0.482	-0.263	0.046	4.637	3.123	1.194	11.238	69.118				
											2009	Change 2004/2009	Change 2007/2009									
INNOTYPE																						
High	-1.110	0.210	1.353	0.006	-0.194	0.933	0.980	5	0	0	-0.611	0.615	0.201						0.045	-0.151	-0.016	-0.017
Med-high	-0.546	-0.222	20.483	1.546	-0.322	1.561	0.965	5	2	0	-0.390	0.073	-0.026						0.046	-0.117	0.000	0.008
Med	-0.310	0.099	15.135	1.224	-0.065	-2.755	0.995	5	0	0	0.458	-0.299	-0.107						0.056	-0.026	-0.003	0.027
Med-low	0.141	-0.336	6.968	-6.523	-0.260	-9.671	0.599	5	0	0	0.285	0.252	-0.062						0.050	-0.122	0.003	0.002
Low	0.426	-0.256	22.688	-2.239	-0.316	3.486	1.186	1	0	0	1.075	-0.179	0.023						0.001	-0.038	0.000	-0.003
EDUTYPE																						
High	-0.692	0.207	12.643	1.956	-0.009	0.211	0.960	1	0	0	-0.336	0.239	0.045									
Med-high	-0.994	0.490	9.151	1.757	0.274	10.998	0.560	5	4	0	-0.555	0.222	0.116									
Med	0.070	-0.075	33.827	-0.881	-0.110	0.702	1.083	1	0	0	-0.561	0.636	0.134									
Med-low	0.302	0.080	18.065	-3.091	-0.545	-3.624	1.147	3	0	0	0.851	-0.138	0.030									
Low	0.192	-0.008	26.314	0.259	-0.316	2.423	1.196	5	0	0	0.466	-0.210	-0.097									
Total	0.000	0.000	100.000	0.000	-0.230	0.000	1.103	5	0	0	0.000	0.000	0.000	18.821	11.631	4.128	19.131	52.670	0.214	-0.463	-0.016	0.019

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A13.2: Selected Sectors I - Latvia

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
201	Sawmilling and planing of wood, impregnation of wood	3.312
204	Manufacture of wooden containers	2.796
202	Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board and other	2.685
203	Manufacture of builders' carpentry and joinery	2.303
265	Manufacture of cement, lime and plaster	2.051
Top-3 sectors (NACE 2-digit)		
20	Wood and of wood and cork	2.866
15	Food and beverages	0.619
27	Basic metals	0.565

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
201	Sawmilling and planing of wood, impregnation of wood	3.142
202	Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board	2.342
152	Processing and preserving of fish and fish products	2.107
204	Manufacture of wooden containers	1.602
177	Manufacture of knitted and crocheted articles	1.334
Top-3 sectors (NACE 2-digit)		
20	Wood and products of wood and cork	1.712
60	Inland transport	0.801
70	Real estate activities	0.550

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
231	Coke oven products	7.981
267	Cutting, shaping and finishing of stone	5.134
341	Manufacture of motor vehicles	3.065
281	Manufacture of structural metal products	2.835
323	Manuf. of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	2.827
274	Manufacture of basic precious and non-ferrous metals	-1.056
247	Manufacture of man-made fibres	-1.073
222	Printing and service activities related to printing	-1.850
171	Preparation and spinning of textile fibres	-2.407
183	Dressing and dyeing of fur; manufacture of articles of fur	-2.546
The 3 winning and 3 losing sectors (NACE 2-digit)		
34	Motor vehicles, trailers and semi-trailers	2.360
32	Radio, television and communication equipment	2.170
30	Office, accounting and computing machinery	2.089
20	Wood and of wood and cork	-0.490
23	Coke, refined petroleum and nuclear fuel	-0.607
18	Wearing apparel, dressing and dyeing of fur	-0.965

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
	n.a	n.a
	n.a	n.a
	n.a	n.a
	n.a	n.a
	n.a	n.a
	n.a	n.a
	n.a	n.a
	n.a	n.a
	n.a	n.a
	n.a	n.a
The 3 winning and 3 losing sectors (NACE 2-digit)		
62	Air transport	1.226
70	Real estate activities	1.095
37	Recycling	0.670
64	Post and telecommunications	-0.874
20	Wood and products of wood and cork	-1.294
63	Supporting and auxiliary transport activities; activities of travel agencies	-2.280

Source: Eurostat (SBS, Comext).

Table A13.3: Selected Sectors II - Latvia

Revealed comparative advantage (RCA)

		RCA (export)			Export shares in price segments					
					Low			High		
		2010	Change 1999/2010	Change 2007/2010	2009 in %	Change 1999/2009	Change 2007/2009	2009 in %	Change 1999/2009	Change 2007/2009
Top-5 industries (NACE 3-digit)						in percentage points			in percentage points	
201	Sawmilling and planing of wood, impregnation of wood	3.312	-0.692	-0.023	94.721	-3.805	16.982	1.739	1.666	-0.797
204	Manufacture of wooden containers	2.796	0.174	-0.100	98.630	-1.284	19.529	0.265	0.179	-9.738
202	Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board and other	2.685	-0.207	0.271	86.859	1.802	17.512	0.558	0.202	0.268
203	Manufacture of builders' carpentry and joinery	2.303	0.215	-0.042	72.658	-21.121	-5.019	7.547	4.166	1.462
265	Manufacture of cement, lime and plaster	2.051	0.814	0.627	95.398	-4.602	38.969	1.557	1.557	1.557

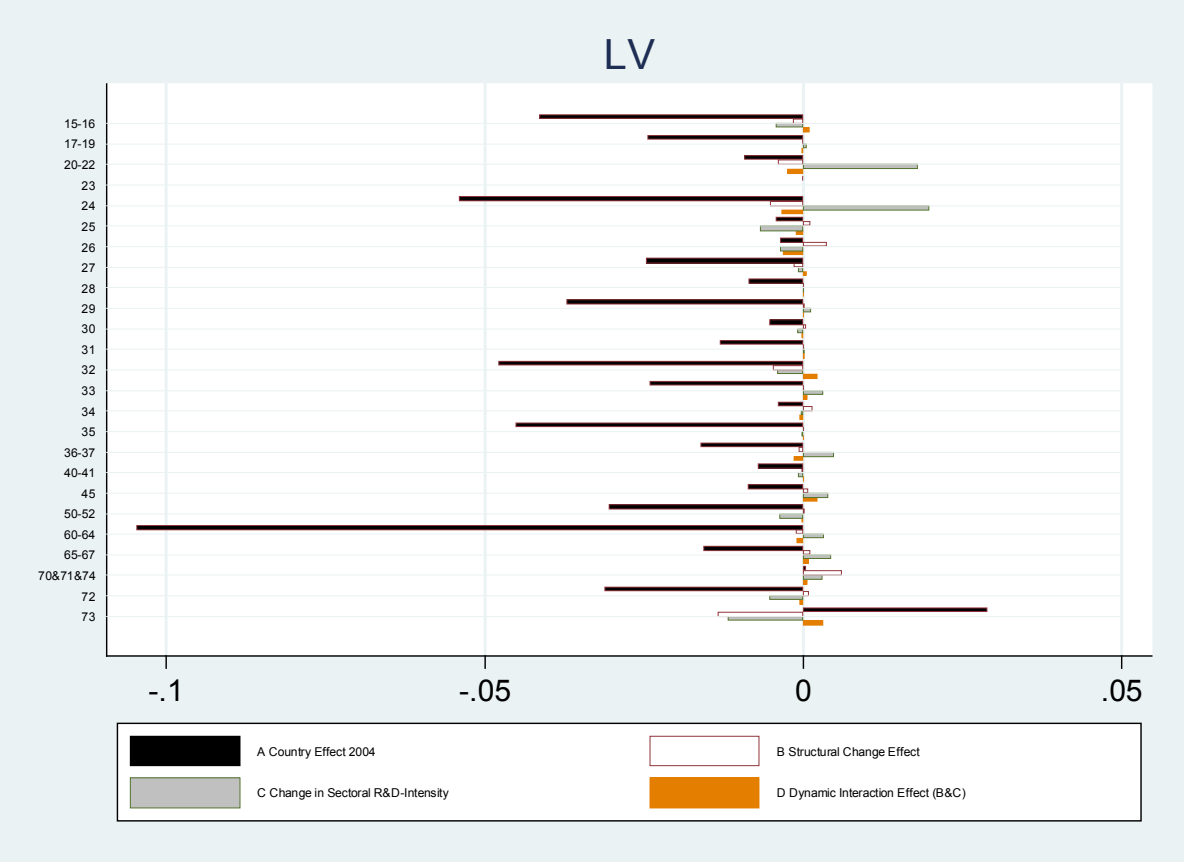
Relative value added (RVA)

		RVA		RCA (export)			Export shares in price segments					
							Low			High		
		2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Change 1999/2007	Change 2007/2009	2007	Change 1999/2007	Change 2007/2009
Top-5 industries (NACE 3-digit)								in percentage points			in percentage points	
201	Sawmilling and planing of wood, impregnation of wood	23.150	-	3.335	-0.669	-0.023	77.739	-20.787	16.982	2.536	2.462	-0.797
202	Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board	10.399	-	2.414	-0.477	0.271	69.348	-15.710	17.512	0.289	-0.067	0.268
152	Processing and preserving of fish and fish products	8.220	-	1.679	0.239	-0.167	79.835	-3.111	-7.219	6.735	-8.736	-5.555
204	Manufacture of wooden containers	4.963	-	2.896	0.274	-0.100	79.100	-20.814	19.529	10.003	9.917	-9.738
177	Manufacture of knitted and crocheted articles	3.796	-	0.664	-0.744	-0.131	35.944	-9.329	-22.039	0.000	0.000	5.135

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext).

Graph A13.3: Sectoral R&D decomposition: Change in structure, R&D intensity and interaction between structure and intensity, NACE-2-digit level



1.14. Lithuania

Trade and industry specialisation

At the detailed manufacturing industry level, Lithuania is specialised in labour-intensive (wooden containers, sawmilling, builders' carpentry) and marketing-driven industries (processing and preserving of fish, dairy products), in exports as well in capital-intensive industries (refined petroleum products). At the more aggregated sector level, Lithuania is specialised in low and medium-low innovation and education sectors (wearing apparel, inland transport), in exports also in medium-high sectors (textiles, coke and refined petroleum). Its share of high growth firms indicates that Lithuania is catching up, while the high share of exports to the BRIC countries reflects Lithuania's past as a member of the former Soviet Union.

Export quality and sectoral R&D performance

Given its industrial structure, Lithuania's R&D intensity is below average, as are its shares in the high price segment of industries. Its export shares are high in the low price segment, indicating an unfavourable position on the quality ladder. Overall, Lithuania shares all the characteristics of its group of lower income countries specialised in labour-intensive industries (group 4), with sometimes even more negative specialisation in knowledge-intensive industries.

Structural change

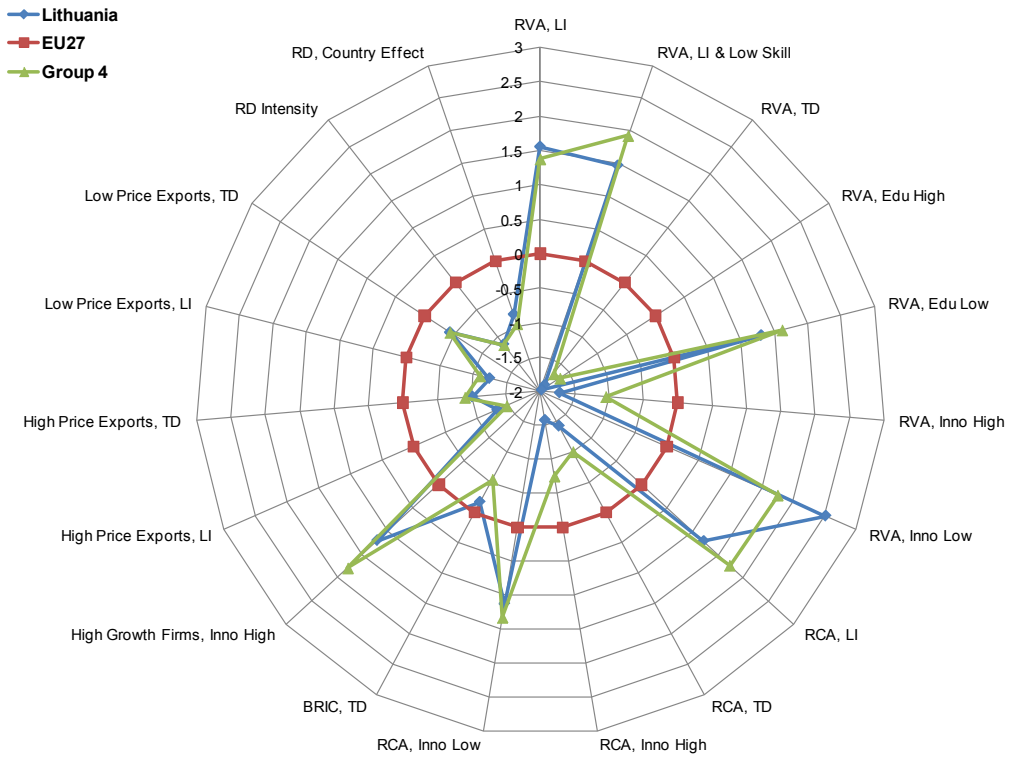
In terms of change, Lithuania increased its relative value added share in high education sectors (computers, software, business services) and its relative export share in technology-driven industries (electricity distribution and control apparatus), while it decreased trade specialisation in labour-intensive industries and in high education sectors; it also decreased its relative shares in high innovation sectors further (communication equipment), but gains in medium-high innovation sectors (motor vehicles). It substantially improved its position on the quality ladder, with the exception of the share in the low price segment of technology-driven industries, which decreased in Lithuania relative to the EU as opposed to the increasing share typical of group 4. Its sectoral R&D intensity is rising more quickly than in the EU, e.g. in machinery.

Overall, Lithuania is catching up with respect to competitiveness. In comparison with its similar neighbour Latvia, Lithuania's specialisation profile is less clearly improving, while its sectoral upgrading performance is superior to Latvia.

Impact of the crisis

The crisis clearly slowed Lithuania's structural change towards technology-driven industries, while increasing capital-intensive industries.

Graph A14.1: Level



Graph A14.2: Change

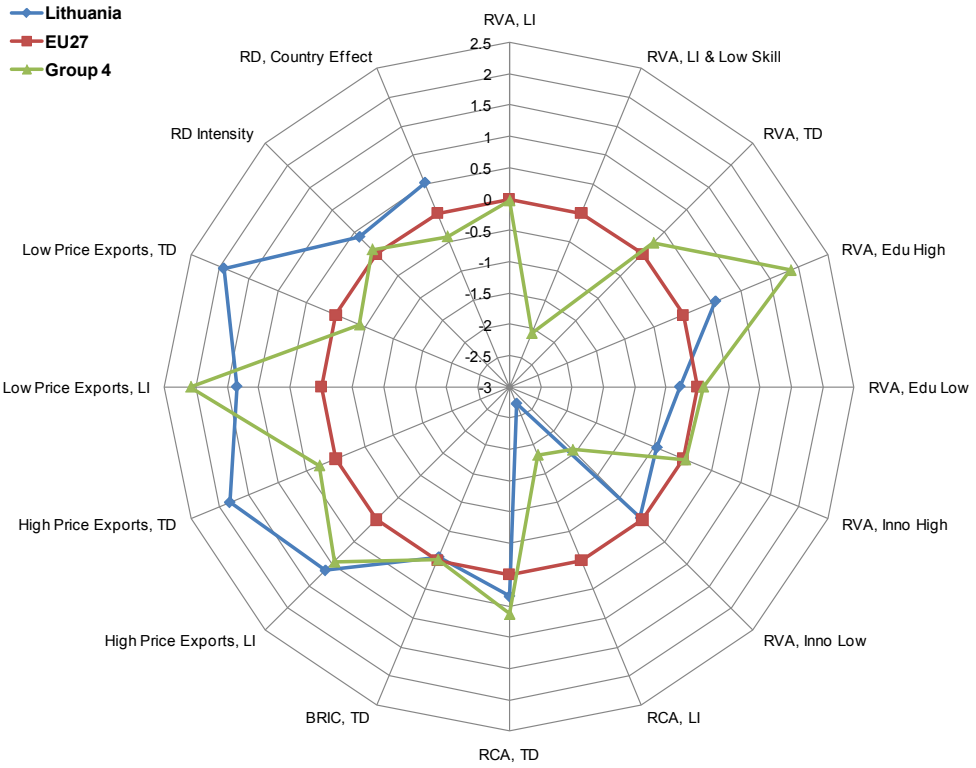


Table A14.1: Summary table - Lithuania

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2005	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
																Percentage points						
Factor inputs																						
Mainstream industries	-0.261	0.207									-0.331	0.229	-0.006	5.107	3.823	0.963	17.237	49.777				
Labourintensive industries	0.515	0.005									0.629	-0.556	-0.157	2.594	1.856	0.528	14.005	59.713				
Capital intensive industries	0.003	0.296									0.515	0.156	0.245	1.765	0.662	0.667	1.557	72.570				
Marketing driven industries	0.350	-0.108									0.212	0.163	-0.084	3.624	1.770	0.653	14.724	54.108				
Technology driven industries	-1.419	-0.532									-0.922	0.292	-0.200	2.172	1.071	-1.854	24.635	46.101				
Skill intensity																						
Low skill industries	0.421	-0.201																				
Medium/blue collar workers	0.077	0.423																				
Medium/white collar workers	-0.177	0.030																				
High skill industries	-1.341	0.147																				
Labour intensive and low skill industries	0.822	-0.489																				
Revealed quality elasticity																						
High RQE	-0.336	-0.264									-0.541	-0.283	-0.119	7.370	4.555	-0.080	20.748	51.098				
Medium RQE	0.173	0.005									0.619	0.332	0.177	4.554	2.287	0.908	7.690	59.384				
Low RQE	0.136	0.317									-0.143	-0.213	-0.188	3.339	2.338	0.128	9.333	71.411				
											2009	Change 2004/2009	Change 2007/2009									
INNOTYPE																						
High	-1.123	-0.177	2.094	-0.831	0.501	0.832	0.557	4	-1	0	-0.872	-0.087	-0.211						0.094	-0.186	-0.005	0.039
Med-high	-0.289	-0.295	16.227	3.265	0.509	48.635	0.659	5	0	0	0.146	0.053	0.117						0.045	-0.417	0.037	-0.019
Med	-0.456	0.275	11.309	2.632	0.871	-5.499	0.520	5	0	0	-0.216	-0.030	-0.027						0.071	-0.018	0.005	0.040
Med-low	0.309	-0.442	11.244	-6.821	0.674	-15.207	0.565	4	-1	0	0.472	0.283	-0.060						0.016	-0.217	-0.008	-0.036
Low	0.412	-0.005	22.437	1.850	0.287	-4.435	0.653	3	-1	0	0.774	-0.273	-0.138						0.007	-0.027	-0.001	0.000
EDUTYPE																						
High	-0.834	0.193	6.696	2.425	0.385	5.734	0.266	3	-1	0	-1.808	-0.098	-0.132									
Med-high	-0.387	-0.140	7.697	1.053	0.476	-7.097	0.745	5	0	0	0.201	-0.014	0.160									
Med	-0.062	-0.037	30.328	-4.884	0.920	5.889	0.560	1	0	0	-0.590	0.228	-0.132									
Med-low	0.425	0.119	25.412	2.922	0.798	1.463	0.712	1	0	0	0.782	-0.020	-0.070									
Low	0.233	-0.024	29.867	-1.517	1.200	-5.739	0.644	5	0	0	0.200	-0.074	-0.052									
Total	0.000	0.000	100.000	0.000	0.934	0.000	0.594	5	0	0	0.000	0.000	0.000	15.263	9.181	0.956	11.515	60.060	0.268	-0.856	0.029	0.056

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A14.2: Selected Sectors I - Lithuania

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
204	Manufacture of wooden containers	2.105
203	Manufacture of builders' carpentry and joinery	1.990
232	Refined petroleum products	1.764
152	Processing and preserving of fish and fish products	1.634
183	Dressing and dyeing of fur; manufacture of articles of fur	1.435
Top-3 sectors (NACE 2-digit)		
23	Coke, refined petroleum and nuclear fuel	1.688
16	Tobacco	1.374
20	Wood and products of wood and cork	1.285

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
201	Sawmilling and planing of wood, impregnation of wood	1.642
152	Processing and preserving of fish and fish products	1.775
183	Dressing and dyeing of fur; manufacture of articles of fur	1.624
268	Manufacture of other non-metallic mineral products	1.394
155	Manufacture of dairy products	1.683
Top-3 sectors (NACE 2-digit)		
18	Wearing apparel, dressing and dyeing of fur	1.189
20	Wood and products of wood and cork	1.009
60	Inland transport	0.841

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
233	Nuclear fuel	4.217
355	Manufacture of other transport equipment n.e.c.	4.013
296	Manufacture of weapons and ammunition	3.003
267	Cutting, shaping and finishing of stone	2.755
247	Manufacture of man-made fibres	2.557
182	Manufacture of other wearing apparel and accessories	-1.411
191	Tanning and dressing of leather	-1.718
353	Manufacture of aircraft and spacecraft	-1.947
321	Manufacture of electronic valves and tubes and other electronic components	-2.421
231	Coke oven products	-5.291
The 3 winning and 3 losing sectors (NACE 2-digit)		
30	Office, accounting and computing machinery	1.408
34	Motor vehicles, trailers and semi-trailers	1.173
21	Pulp, paper and paperboard	0.611
32	Radio, television and communication equipment	-0.497
19	Leather, leather and footwear	-1.347
18	Wearing apparel, dressing and dying of fur	-1.397

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
183	Dressing and dyeing of fur; manufacture of articles of fur	4.211
268	Manufacture of other non-metallic mineral products	2.801
171	Preparation and spinning of textile fibres	2.377
282	Manufacture of tanks, reservoirs and containers of metal; manufacture of central heating raators and boilers	2.160
174	Manufacture of made-up textile articles, except apparel	1.932
16	Manufacture of tobacco products	-2.715
321	Manufacture of electronic valves and tubes and other electronic components	-3.433
172	Textile weaving	-3.706
191	Tanning and dressing of leather	-3.755
177	Manufacture of knitted and crocheted articles	-3.785
The 3 winning and 3 losing sectors (NACE 2-digit)		
37	Recycling	1.416
36	Furniture, jewellery, musical instruments, sports goods, games and toys	1.342
30	Office, accounting and computing machinery	0.586
41	Water supply	-2.277
61	Water transport	-2.608
23	Coke, refined petroleum and nuclear fuel	-2.936

Source: Eurostat (SBS, Comext).

Table A14.3: Selected Sectors II - Lithuania

Revealed comparative advantage (RCA)

	RCA (export)			Export shares in price segments					
					Low			High	
	2010	Change 1999/2010	Change 2007/2010	2009 in %	Change 1999/2009	Change 2007/2009	2009 in %	Change 1999/2009	Change 2007/2009
Top-5 industries (NACE 3-digit)					in percentage points			in percentage points	
204 Manufacture of wooden containers	2.105	-0.008	-0.240	96.404	-1.307	17.876	0.229	0.229	-2.106
203 Manufacture of builders' carpentry and joinery	1.990	0.921	-0.023	40.828	-45.509	4.484	13.920	11.211	-5.615
232 Refined petroleum products	1.764	-0.264	0.477	66.940	-8.058	-13.194	0.026	-0.472	-0.785
152 Processing and preserving of fish and fish products	1.634	0.931	0.159	41.023	-29.504	-12.414	35.341	25.273	-1.931
183 Dressing and dyeing of fur; manufacture of articles of fur	1.435	-0.866	0.172	1.711	-0.831	-24.302	55.323	2.815	-15.567

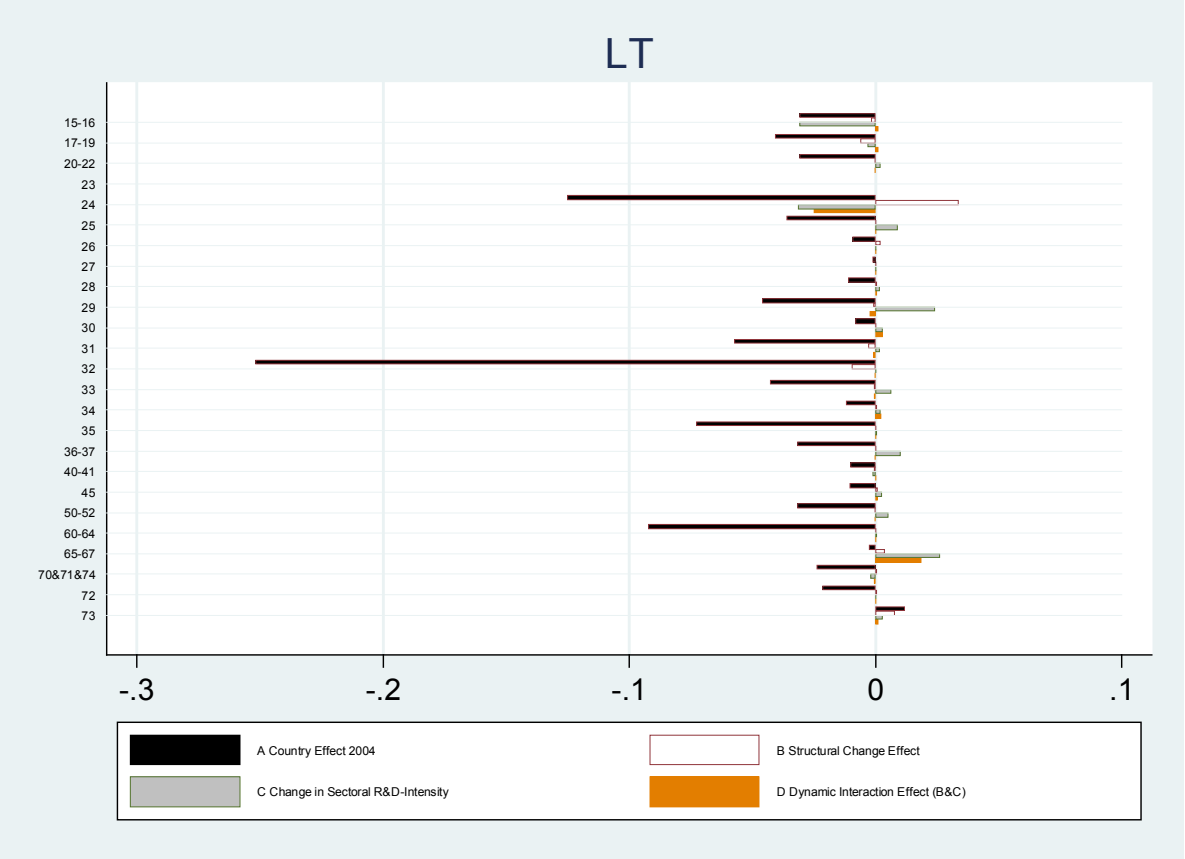
Relative value added (RVA)

	RVA		RCA (export)			Export shares in price segments				
							Low			High	
	2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Change 1999/2007	Change 2007/2009	2007	Change 1999/2007	Change 2007/2009
Top-5 industries (NACE 3-digit)							in percentage points			in percentage points	
201 Sawmilling and planing of wood, impregnation of wood	5.165	-0.796	1.367	-0.843	-0.141	75.468	-6.803	7.962	6.014	6.002	-1.594
152 Processing and preserving of fish and fish products	5.901	-0.314	1.475	0.772	0.159	53.437	-17.090	-12.414	37.271	27.203	-1.931
183 Dressing and dyeing of fur; manufacture of articles of fur	5.076	4.388	1.262	-1.038	0.172	26.013	23.471	-24.302	70.890	18.382	-15.567
268 Manufacture of other non-metallic mineral products	4.031	2.436	0.693	0.685	-0.443	94.147	6.691	-13.265	3.158	2.490	-0.388
155 Manufacture of dairy products	5.379	0.753	1.359	-0.200	-0.221	58.276	-39.709	26.298	5.093	4.611	-3.305

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext).

Graph A14.3: Sectoral R&D decomposition: Change in structure, R&D intensity and interaction between structure and intensity, NACE-2-digit level



1.15. Luxembourg

Trade and industry specialisation

At the detailed manufacturing industry level, Luxembourg is specialised in mainstream manufacturing industries (rubber products) and capital-intensive industries (basic iron and steel, cement, basic non-ferrous metals), and also in exports of technology-driven industries (radio and TV transmitters). However, as Luxembourg is a small country with a small share of manufacturing, export indicators should be interpreted with care. At the more aggregated sector level, Luxembourg is highly specialised in high education sectors (research and development, business services, finance), but also in low education ones (construction, inland transport). Furthermore, Luxembourg features specialisation in medium and medium-high innovation sectors (e.g., basic metals, textiles, air transport). Its share of exports to the BRIC countries is very low in technology-driven sectors.

Export quality and sectoral R&D performance

Luxembourg is high on the quality ladder in technology-driven industries, but slightly below the EU average in labour-intensive industries. Unfortunately, there are no R&D data to fully assess Luxembourg's sectoral upgrading performance. Overall, Luxembourg is a complex case that is not easy to categorize. It shares characteristics with higher income countries specialised in knowledge-intensive industries, higher income countries specialised in labour-intensive industries and lower income countries featuring trade specialisation in knowledge-intensive industries. Due to the very negative value added specialisation in technology-driven industries and highly innovation-intensive sectors, as well as its mixed quality performance, Luxembourg was attributed to the group of higher income countries with specialisation in labour-intensive industries (group 2).

Structural change

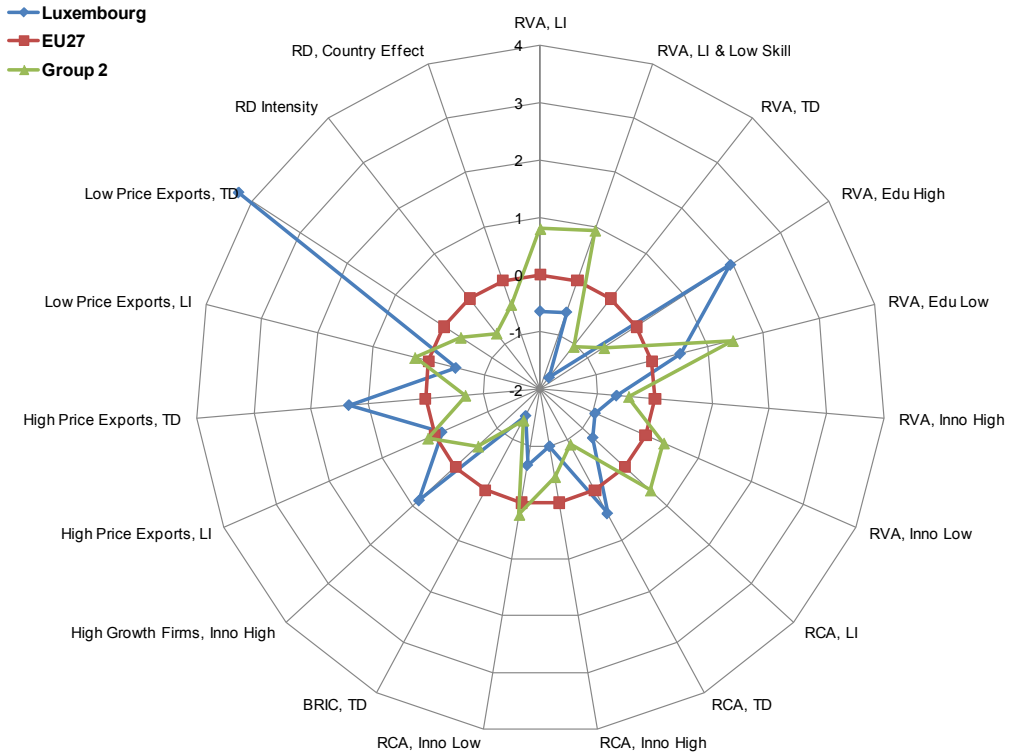
In terms of change, Luxembourg moved overall towards more knowledge-intensive industries and a higher position on the quality ladder, also in labour-intensive industries. It increased trade specialisation in technology-driven industries (radio and TV transmitters, medical and surgical equipment) and valued added specialisation in high education and innovation sectors (computers, research and development, business services), while it decreased its trade specialisation in high education sectors (financial services).

Overall, Luxembourg faces a favourable position with respect to competitiveness, in particular given its improvement in terms of quality segments and specialisation. Unfortunately we miss R&D information to fully assess sectoral upgrading; in any case if Luxembourg keeps up its momentum, it will soon upgrade to the group of higher income countries specialised in knowledge-intensive industries, similar to countries such as Belgium and the Netherlands which also feature specialisation in high education sectors.

Impact of the crisis

The crisis has had an impact on Luxembourg's industrial structure in terms of slowing down structural change towards technology-driven industries, but also accelerating the decline of labour-intensive industries; the crisis "winners" were the mainstream manufacturing industries.

Graph A15.1: Level



Graph A15.2: Change

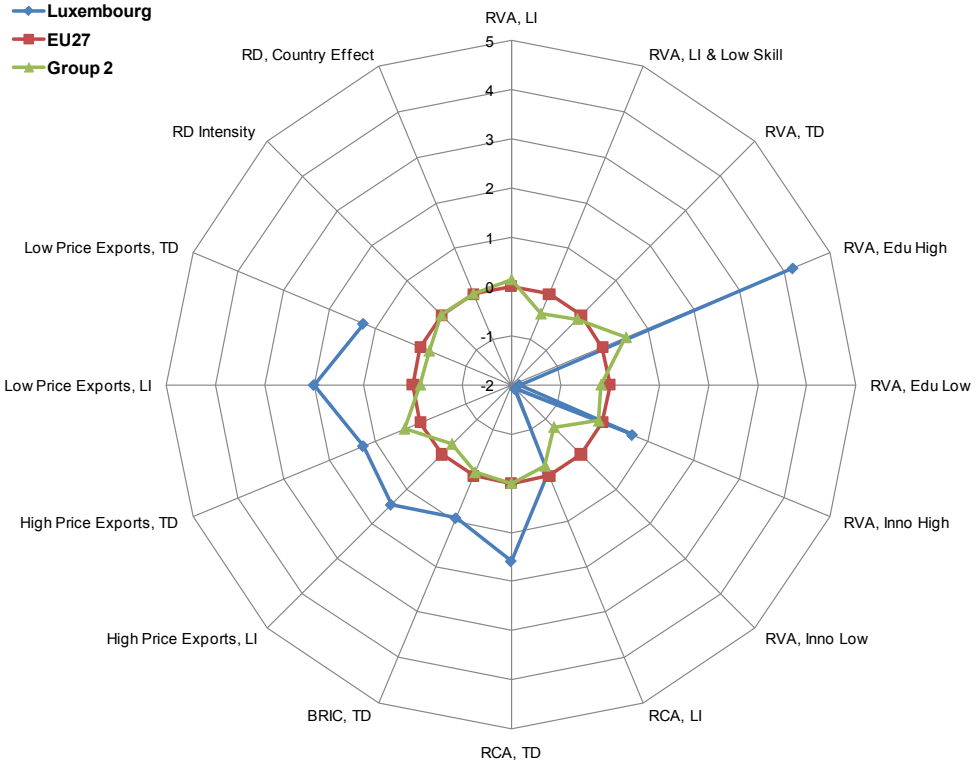


Table A15.1: Summary table - Luxembourg

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2007	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
																Percentage points						
Factor inputs																						
Mainstream industries	0.421	n.a.									0.057	-0.218	0.204	1.153	0.245	0.091	35.424	28.831				
Labourintensive industries	-0.326	n.a.									-0.780	-0.066	-0.127	0.036	0.020	-0.057	33.981	34.162				
Capital intensive industries	0.490	n.a.									0.096	-0.426	-0.148	0.799	0.456	-0.103	26.100	30.045				
Marketing driven industries	-0.125	n.a.									-0.524	-0.160	0.112	0.060	0.030	0.039	57.988	17.328				
Technology driven industries	-1.199	n.a.									0.177	0.491	-0.022	0.679	0.640	0.293	75.182	1.995				
Skill intensity																						
Low skill industries	0.783	n.a.																				
Medium/blue collar workers	-0.577	n.a.																				
Medium/white collar workers	-0.653	n.a.																				
High skill industries	-0.898	n.a.																				
Labour intensive and low skill industries	-0.709	n.a.																				
Revealed quality elasticity																						
High RQE	-0.904	n.a.									-0.126	0.376	0.681	1.224	0.711	0.321	76.483	9.464				
Medium RQE	-0.028	n.a.									-0.026	-0.056	-0.496	0.580	0.144	-0.006	55.595	9.042				
Low RQE	0.640	n.a.									0.209	-0.344	-0.100	0.923	0.536	-0.053	27.034	31.744				
INNOTYPE											2009	Change 2004/2009	Change 2007/2009									
High	-0.303	0.131	1.441	-0.004	-0.023	2.889	0.427	5	4	-	-0.458	-0.136	0.196						0.000	0.000	0.000	0.000
Med-high	0.292	-0.054	20.325	0.634	-0.268	1.556	0.672	1	-1	0	-0.987	-0.172	0.014						0.000	0.000	0.000	0.000
Med	0.321	0.316	37.780	3.238	-0.038	-0.870	0.436	1	0	0	1.241	0.036	-0.093						0.000	0.000	0.000	0.000
Med-low	-0.752	-0.318	2.695	-1.164	-0.435	-3.463	-0.217	3	1	0	-0.292	-0.026	0.111						0.000	0.000	0.000	0.000
Low	-0.215	-0.362	11.622	-0.375	0.069	0.346	0.241	1	-4	+	-1.140	0.426	0.226						0.000	0.000	0.000	0.000
EDUTYPE																						
High	0.446	0.461	13.043	3.532	-0.036	-1.688	0.227	2	0	-	1.502	-0.075	-0.157									
Med-high	-0.544	-0.282	33.685	3.310	-0.354	6.847	0.556	1	-2	+	-0.675	0.197	0.295									
Med	-0.329	-0.111	24.582	-2.420	0.129	1.135	-0.096	1	-2	+	-1.094	0.198	0.288									
Med-low	0.050	-0.085	10.931	-1.803	0.023	-0.791	0.340	5	0	0	-0.841	0.013	0.041									
Low	0.099	-0.162	17.759	-2.618	-0.068	-1.461	-0.368	5	1	-	-0.634	-0.376	-0.086									
Total	0.000	0.000	100.000	0.000	0.004	0.005	0.075	1	0	0	0.000	0.000	0.000	2.727	1.392	0.263	54.544	15.333	0.000	0.000	0.000	0.000

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A15.2: Selected Sectors I - Luxembourg

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	2.300
175	Manufacture of other textiles	1.803
271	Manufacture of basic iron and steel and of ferro-alloys (ECSC)	1.650
265	Manufacture of cement, lime and plaster	1.525
202	Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board and other	1.243
Top-3 sectors (NACE 2-digit)		
32	Radio, television and communication equipment	1.399
30	Office, accounting and computing machinery	1.051
27	Basic metals	1.050

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
175	Manufacture of other textiles	2.641
251	Manufacture of rubber products	2.302
271	Manufacture of basic iron and steel and of ferro-alloys (ECSC)	1.841
274	Manufacture of basic precious and non-ferrous metals	1.841
262	Manufacture of non-refractory ceramic goods other than for construction purposes	1.342
Top-3 sectors (NACE 2-digit)		
73	Research and development	1.886
62	Air transport	1.681
27	Basic metals	1.593

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
193	Manufacture of footwear	2.305
354	Manufacture of motorcycles and bicycles	2.243
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	2.205
171	Preparation and spinning of textile fibres	2.183
331	Manufacture of medical and surgical equipment and orthopaedic appliances	1.884
351	Building and repairing of ships and boats	-1.745
272	Manufacture of tubes	-2.024
246	Manufacture of other chemical products	-2.204
365	Manufacture of games and toys	-2.358
283	Manufacture of steam generators, except central heating hot water boilers	-3.981
The 3 winning and 3 losing sectors (NACE 2-digit)		
19	Leather, leather and footwear	1.848
30	Office, accounting and computing machinery	1.446
35	Other transport equipment	1.224
28	Fabricated metal	-0.640
16	Tobacco products	-0.651
24	Chemicals and chemical products	-0.897

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
	n.a.	n.a
	n.a.	n.a
	n.a.	n.a
	n.a.	n.a
	n.a.	n.a
	n.a.	n.a.
	n.a.	n.a.
	n.a.	n.a.
	n.a.	n.a.
	n.a.	n.a.
The 3 winning and 3 losing sectors (NACE 2-digit)		
27	Basic metals	1.188
73	Research and development	1.175
74	Business services	0.633
64	Post and telecommunications	-0.513
61	Water transport	-1.023
37	Recycling	-2.000

Source: Eurostat (SBS, Comext).

Table A15.3: Selected Sectors II - Luxembourg

Revealed comparative advantage (RCA)

		RCA (export)			Export shares in price segments					
					Low			High		
		2010	Change 1999/2010	Change 2007/2010	2009 in %	Change 1999/2009	Change 2007/2009	2009 in %	Change 1999/2009	Change 2007/2009
Top-5 industries (NACE 3-digit)						in percentage points			in percentage points	
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	2.300	2.205	2.276	0.282	0.201	0.282	99.519	2.091	7.559
175	Manufacture of other textiles	1.803	0.015	0.406	1.452	-45.709	-8.396	51.537	18.397	16.049
271	Manufacture of basic iron and steel and of ferro-alloys (ECSC)	1.650	-0.631	0.051	38.326	3.040	-38.724	17.040	9.619	16.930
265	Manufacture of cement, lime and plaster	1.525	-0.211	0.211	27.551	-35.398	23.065	1.353	1.353	-25.635
202	Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board and other	1.243	-0.027	0.300	53.766	0.415	7.012	3.257	3.208	-2.781

Relative value added (RVA)

		RVA		RCA (export)			Export shares in price segments					
							Low			High		
		2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Change 1999/2007	Change 2007/2009	2007	Change 1999/2007	Change 2007/2009
Top-5 industries (NACE 3-digit)								in percentage points			in percentage points	
175	Manufacture of other textiles	14.027	-	1.397	-0.391	0.406	9.848	-37.313	-8.396	35.488	2.348	16.049
251	Manufacture of rubber products	9.999	-	1.045	-0.339	0.076	81.745	38.450	-70.471	8.061	0.931	3.578
271	Manufacture of basic iron and steel and of ferro-alloys (ECSC)	6.303	-	1.599	-0.682	0.051	77.050	41.764	-38.724	0.110	-7.311	16.930
274	Manufacture of basic precious and non-ferrous metals	6.303	-	0.549	-0.325	-0.338	76.913	52.382	-60.467	10.701	-19.101	47.748
262	Manufacture of non-refractory ceramic goods other than for construction purposes	3.828	-	-3.051	-2.387	1.161	0.000	-10.558	30.397	65.449	-21.671	2.493

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext).

1.16. Hungary

At the detailed manufacturing industry level, Hungary is specialised in technology-driven industries (radio and TV transmitters and receivers), and in value added in capital-intensive industries (refined petroleum). At the more aggregated sector level, Hungary features high specialisation in highly-innovation intensive sectors such as communication equipment, electrical machinery and computers, but not in high education sectors, because of relatively low shares in software, R&D and business services. Hungary shows also a high share of exports to BRIC countries.

Export quality and sectoral R&D performance

Given its industrial structure, Hungary's R&D intensity is particularly low, indicating that Hungary is focusing on the production and assembly-parts of the value chain. Its low position on the quality ladder confirms this. Overall, Hungary is a typical member of the group of lower income countries featuring trade specialisation in knowledge-intensive industries, where the knowledge-creating part is provided by other, more R&D intensive countries.

Structural change

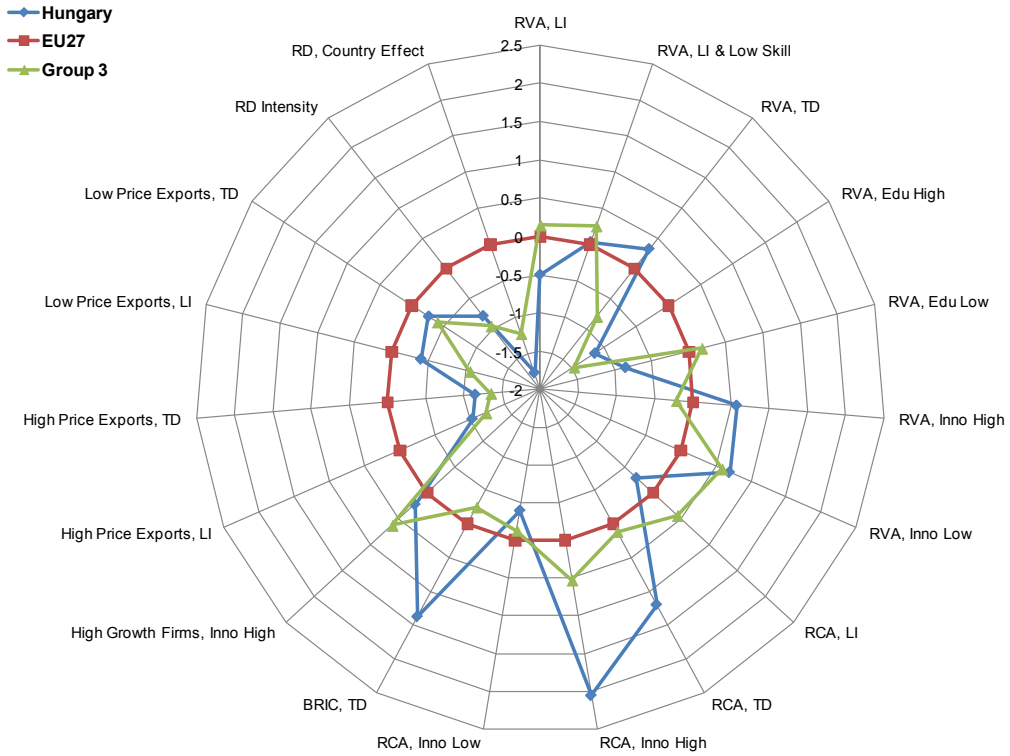
In terms of change, Hungary decreased its relative share of labour-intensive low-skill industries (leather clothes) and of low education sectors, while it increased its relative shares in mainstream manufacturing (electric lamps, isolated wire, batteries*)* trade specialisation in technology-driven industries (air- and spacecraft, measuring instruments) and highly innovation-intensive sectors (computers, electrical machinery). Hungary considerably improved its sectoral R&D intensity, while it moves in both directions on the quality ladder, with quality partly improving, and partly deteriorating.

Overall, Hungary is clearly catching-up with respect to competitiveness. If it moves further up the value chain, i.e. boosts sectoral upgrading, Hungary will ultimately join the group of higher income countries specialised in knowledge-intensive industries.

Impact of the crisis

In Hungary, the crisis clearly slowed structural change towards knowledge-intensive industries, while labour-intensive industries gained relative shares.

Graph A16.1: Level



Graph 16.2: Change

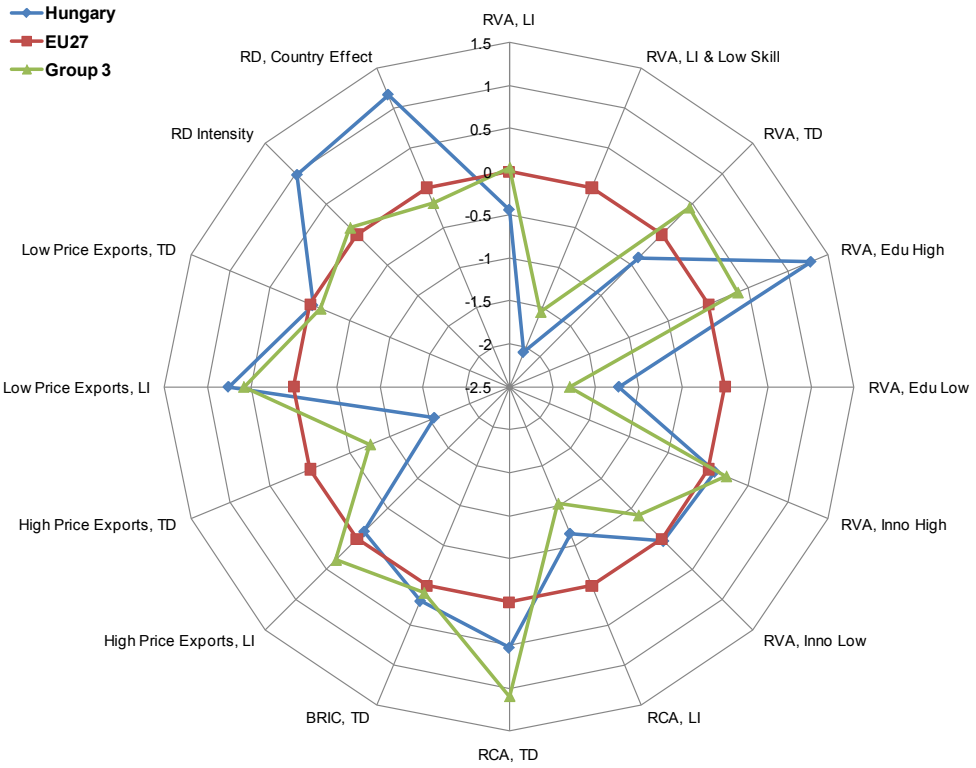


Table A16.1: Summary table - Hungary

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2007	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
Factor inputs																						
Mainstream industries	-0.050	0.153									-0.104	0.077	0.009	1.062	0.763	0.361	24.764	38.636				
Labourintensive industries	-0.249	-0.062									-0.235	-0.355	0.007	0.483	0.416	0.320	18.875	32.477				
Capital intensive industries	0.364	-0.069									-0.431	0.113	0.101	0.525	0.371	0.159	14.435	44.601				
Marketing driven industries	-0.180	-0.043									-0.489	-0.265	0.042	0.238	-0.279	-0.065	26.471	47.514				
Technology driven industries	0.120	-0.031									0.409	0.109	-0.049	3.933	3.261	0.491	21.792	25.109				
Skill intensity																						
Low skill industries	-0.086	-0.157																				
Medium/blue collar workers	-0.037	0.093																				
Medium/white collar workers	0.262	0.153																				
High skill industries	-0.331	-0.147																				
Labour intensive and low skill industries	0.027	-0.349																				
Revealed quality elasticity																						
High RQE	-0.075	-0.037									0.031	0.234	-0.046	3.978	3.146	0.771	25.660	22.964				
Medium RQE	0.087	-0.050									-0.139	-0.328	-0.057	1.022	0.620	0.046	22.417	36.569				
Low RQE	-0.022	0.152									0.073	-0.045	0.135	1.241	0.765	0.451	13.954	45.001				
											2009	Change 2005/2009	Change 2007/2009									
INNOTYPE																						
High	0.204	0.010	11.041	2.266	-0.095	0.174	0.128	3	-1	+	0.564	0.093	0.028						0.145	-0.914	-0.004	0.032
Med-high	0.373	-0.226	17.881	-0.787	-0.023	1.033	0.267	1	0	-	-0.222	-0.059	-0.054						0.285	-0.522	0.019	0.038
Med	-0.382	0.307	17.823	2.801	0.014	-3.228	0.154	1	0	0	-0.476	-0.001	0.078						0.007	-0.054	0.000	0.004
Med-low	0.214	-0.341	8.904	-2.746	0.005	0.161	-0.035	5	2	-	-0.495	-0.080	0.001						0.039	-0.119	0.000	0.017
Low	0.133	0.006	15.004	-0.175	0.356	1.911	0.246	2	-1	+	-0.526	-0.171	-0.035						0.071	0.048	0.003	0.027
EDUTYPE																						
High	-0.398	0.307	17.689	4.067	-0.020	-3.527	0.123	2	1	-	-0.299	-0.145	-0.162									
Med-high	0.350	-0.133	9.372	-0.073	0.705	2.806	0.111	4	3	-	0.187	0.106	0.081									
Med	0.182	0.081	40.422	0.319	0.123	3.126	0.172	1	0	0	0.214	0.020	-0.063									
Med-low	0.000	0.016	13.104	-0.849	0.075	1.704	0.158	5	0	0	-0.190	0.020	0.055									
Low	-0.187	-0.145	19.413	-3.464	0.074	-0.311	-0.029	5	0	0	-0.307	-0.104	0.068									
Total	0.000	0.000	100.000	0.000	0.105	0.000	0.093	5	0	0	0.000	0.000	0.000	6.241	4.531	1.267	21.618	32.391	0.570	-1.556	0.017	0.131

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A16.2: Selected Sectors I - Hungary

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	1.943
323	Manuf. of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	1.754
313	Manufacture of insulated wire and cable	1.000
315	Manufacture of lighting equipment and electric lamps	0.930
342	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers	0.776
Top-3 sectors (NACE 2-digit)		
32	Radio, television and communication equipment	1.559
31	Electrical machinery and apparatus, nec	0.596
30	Office, accounting and computing machinery	0.351

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
315	Manufacture of lighting equipment and electric lamps	2.476
323	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus	2.224
314	Manufacture of accumulators, primary cells and primary batteries	1.699
23	Manufacture of coke, refined petroleum products and nuclear fuel	1.285
262	Manufacture of non-refractory ceramic goods other than for construction purposes	0.942
Top-3 sectors (NACE 2-digit)		
23	Coke, refined petroleum and nuclear fuel	1.562
31	Electrical machinery and apparatus, nec	1.072
32	Radio, television and communication equipment	1.010

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
353	Manufacture of aircraft and spacecraft	6.068
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	4.509
267	Cutting, shaping and finishing of stone	1.909
332	Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes	1.771
154	Manufacture of vegetable and animal oils and fats	0.974
191	Tanning and dressing of leather	-1.354
182	Manufacture of other wearing apparel and accessories	-1.642
177	Manufacture of knitted and crocheted articles	-1.703
183	Dressing and dyeing of fur; manufacture of articles of fur	-1.851
181	Manufacture of leather clothes	-2.617
The 3 winning and 3 losing sectors (NACE 2-digit)		
23	Coke, refined petroleum and nuclear fuel	0.689
32	Radio, television and communication equipment	1.080
33	Medical, precision and optical instruments	1.089
18	Wearing apparel, dressing and dyeing of fur	-1.649
19	Leather, leather and footwear	-0.821
30	Office, accounting and computing machinery	-0.722

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
323	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	7.439
315	Manufacture of lighting equipment and electric lamps	6.459
314	Manufacture of accumulators, primary cells and primary batteries	4.885
297	Manufacture of domestic appliances n.e.c.	1.151
343	Manufacture of parts, accessories for motor vehicles	1.060
16	Manufacture of tobacco products	-1.242
30	Manufacture of office machinery and computers	-1.404
156	Manufacture of grain mill products, starches and starch products	-1.571
181	Manufacture of leather clothes	-1.782
23	Manufacture of coke, refined petroleum products and nuclear fuel	-2.433
The 3 winning and 3 losing sectors (NACE 2-digit)		
32	Radio, television and communication equipment	0.995
70	Real estate activities	0.643
31	Electrical machinery and apparatus	0.527
18	Wearing apparel, dressing and dyeing of fur	-1.415
30	Office, accounting and computing machinery	-2.288
23	Coke, refined petroleum and nuclear fuel	-4.004

Source: Eurostat (SBS, Comext).

Table A16.3: Selected Sectors II - Hungary

Revealed comparative advantage (RCA)

		RCA (export)			Export shares in price segments					
		2010	Change 1999/2010	Change 2007/2010	2009 in %	Low Change 1999/2009	Change 2007/2009	2009 in %	High Change 1999/2009	Change 2007/2009
Top-5 industries (NACE 3-digit)						in percentage points			in percentage points	
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	1.943	4.509	0.083	13.798	-57.936	-42.922	10.621	4.033	2.842
323	Manuf. of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	1.754	-0.026	0.308	38.770	-30.803	0.768	5.739	-5.879	-6.337
313	Manufacture of isulated wire and cable	1.000	-0.441	-0.117	14.645	12.535	-1.503	25.600	-69.805	-38.559
315	Manufacture of lighting equipment and electric lamps	0.930	-0.789	-0.152	58.059	25.469	-0.864	9.559	-26.972	5.995
342	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers	0.776	0.014	0.273	60.631	-2.764	-10.189	13.485	6.483	9.700

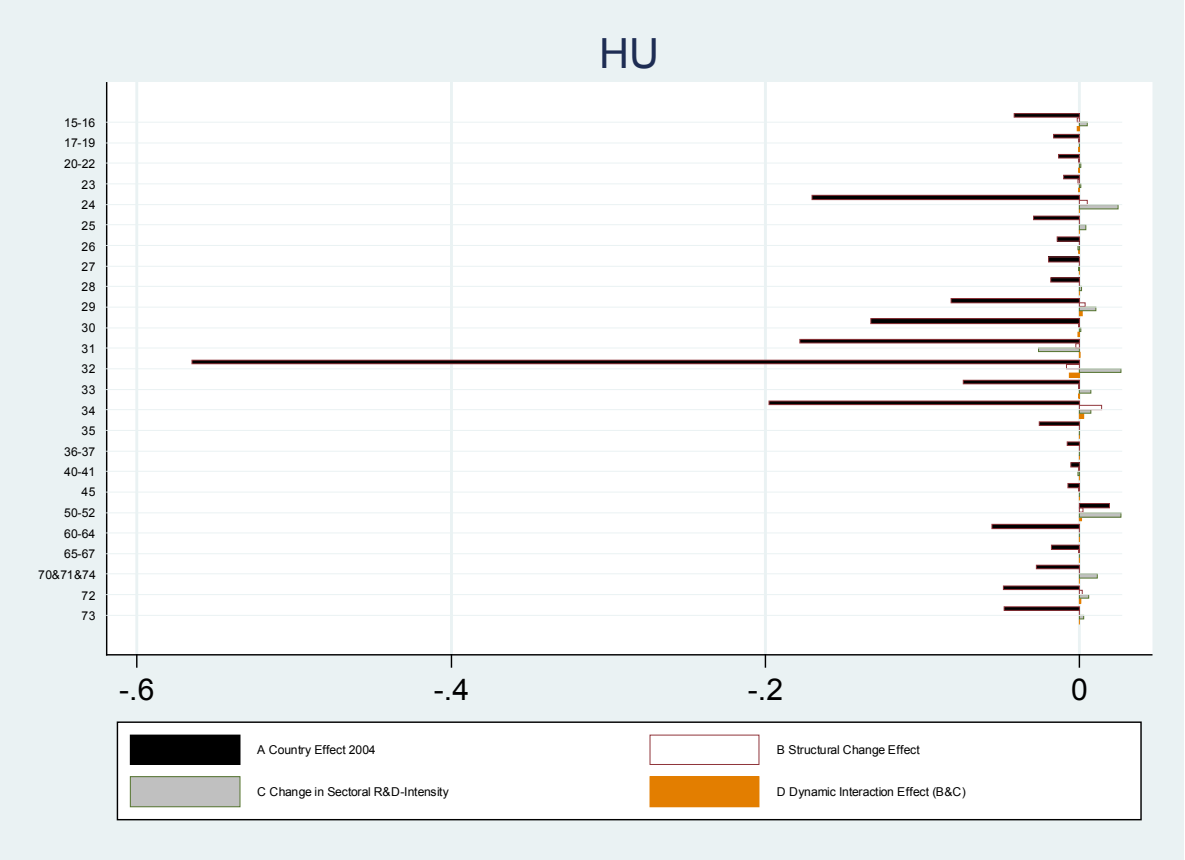
Relative value added (RVA)

		RVA		RCA (export)			Export shares in price segments					
		2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Low Change 1999/2007	Change 2007/2009	2007	High Change 1999/2007	Change 2007/2009
Top-5 industries (NACE 3-digit)								in percentage points			in percentage points	
315	Manufacture of lighting equipment and electric lamps	11.897	4.464	1.082	-0.637	-0.152	58.923	26.333	-0.864	3.564	-32.967	5.995
323	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus	9.248	7.367	1.446	-0.334	0.308	38.002	-31.571	0.768	12.077	0.458	-6.337
314	Manufacture of accumulators, primary cells and primary batteries	5.467	4.405	-0.032	0.056	-0.566	9.049	-5.003	19.438	76.075	-7.548	-54.175
23	Manufacture of coke, refined petroleum products and nuclear fuel	3.616	-2.299	-1.924	-0.516	1.205	-	-	-	-	-	-
262	Manufacture of non-refractory ceramic goods other than for construction purposes	2.566	0.503	0.232	-0.023	0.454	29.516	-12.612	-7.725	46.118	15.000	23.946

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext)

Graph A16.3: Sectoral R&D decomposition: Change in structure, R&D intensity and interaction between structure and intensity, NACE-2-digit level



1.17. Malta

Trade and industry specialisation

As there is no value added data for Malta in the Eurostat Structural Business Statistics Database, its assessment of specialisation is based on trade data and the EU KLEMS database for the sector level (value added relative to EU 25). In terms of export specialisation at the detailed industry level, Malta is highly specialised in technology-driven industries (electronic valves, electricity distribution control apparatus) and weakly specialised in marketing-driven industries (printing and services activities related to printing). However as Malta is a very small country, the export data should be interpreted with care. At the more aggregated sector level, Malta features specialisation in medium-high innovation and education sectors (textiles, chemicals), as well as in low education sectors (construction).

Export quality and sectoral R&D performance

While Malta's R&D intensity is far below the EU average given its industrial structure, its position on the quality ladder is much better, featuring only a slightly higher share in the low price segment of labour intensive industries.

Structural change

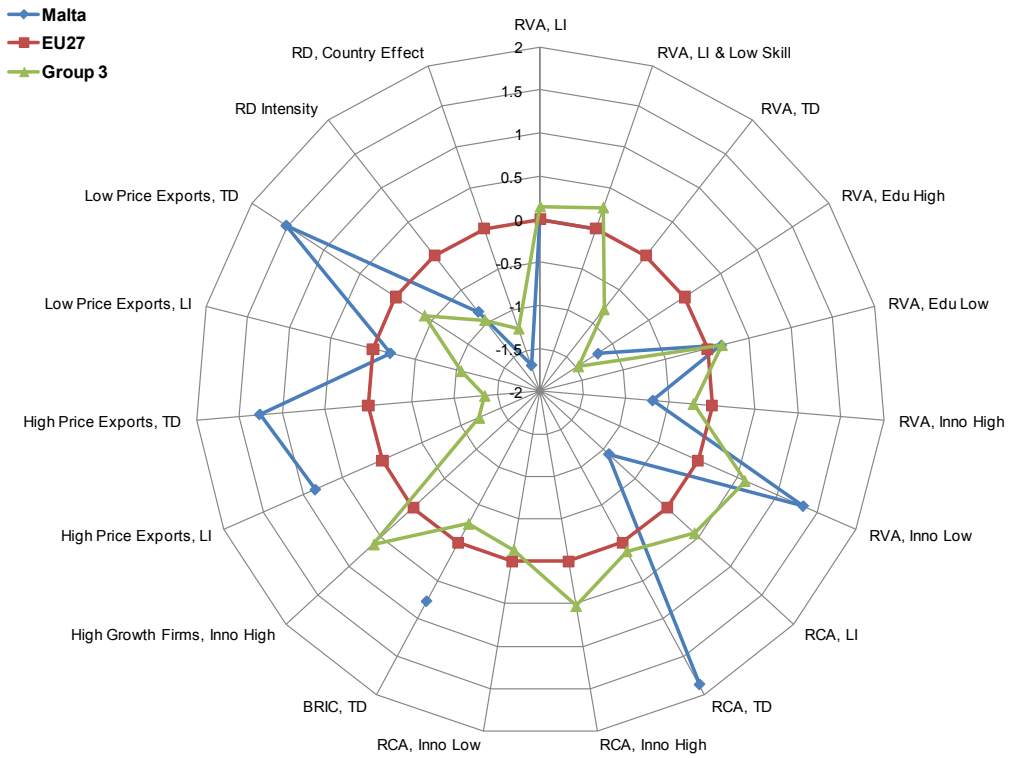
In terms of change, Malta has decreased trade specialisation in labour-intensive industries (leather clothes) but also in technology-driven ones (computers, TV and radio transmitters, medical and surgical equipment), as well as industry specialisation in low innovation and low education sectors (hotels and restaurants, wholesale trade); it increased trade specialisation in capital intensive industries (basic chemicals), mainstream manufacturing (weapons and ammunition, transport equipment) and marketing-driven industries (prepared animal feeds). Like its group of lower income countries featuring trade specialisation in knowledge-intensive industries, Malta has improved its sectoral R&D intensity and has climbed the quality ladder in technology-driven industries, but not in labour-intensive ones, where its position deteriorated .

Overall, Malta's assessment suffers from missing data. However, it can be said that Malta is catching up with respect to competitiveness, even if the patterns of change yield a mixed picture in terms of specialisation and sectoral upgrading.

Impact of the crisis

The crisis clearly slowed down structural change towards technology-driven industries, while it also slowed down the decline of labour-intensive industries.

Graph A17.1: Level



Graph A17.2: Change

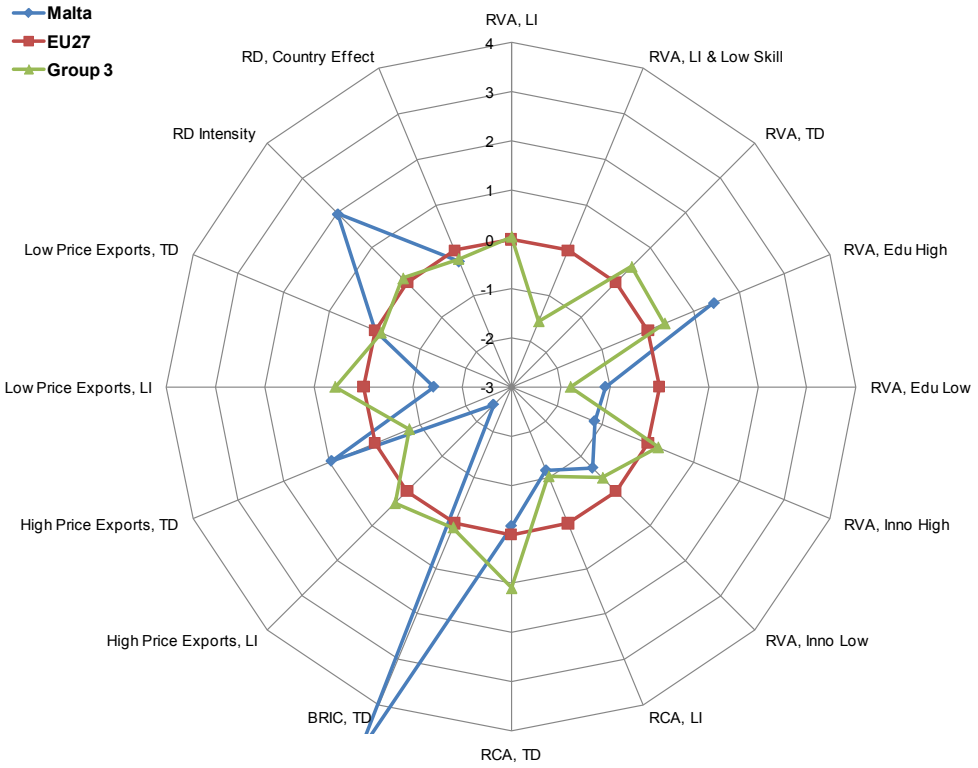


Table A17.1: Summary table - Malta

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2007	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
																			Percentage points			
Factor inputs																						
Mainstream industries	n.a.	n.a.									-0.615	0.239	0.119	0.454	0.417	0.262	54.655	31.983				
Labourintensive industries	n.a.	n.a.									-1.089	-1.020	0.152	0.062	0.019	-0.002	50.404	29.470				
Capital intensive industries	n.a.	n.a.									-0.732	0.750	1.294	0.228	0.226	0.174	56.626	33.378				
Marketing driven industries	n.a.	n.a.									0.095	0.286	-0.132	0.020	0.014	-0.138	46.752	22.070				
Technology driven industries	n.a.	n.a.									0.583	-0.027	-0.160	3.252	3.212	2.006	73.642	4.513				
Skill intensity																						
Low skill industries	n.a.	n.a.																				
Medium/blue collar workers	n.a.	n.a.																				
Medium/white collar workers	n.a.	n.a.																				
High skill industries	n.a.	n.a.																				
Labour intensive and low skill industries	n.a.	n.a.																				
Revealed quality elasticity																						
High RQE	n.a.	n.a.									-0.362	0.122	0.029	0.921	0.864	0.552	41.604	18.963				
Medium RQE	n.a.	n.a.									0.788	-0.065	-0.049	2.787	2.742	1.532	83.420	6.268				
Low RQE	n.a.	n.a.									-1.131	0.318	0.162	0.307	0.281	0.218	51.180	17.898				
											2009	Change 2004/2009	Change 2007/2009									
INNOTYPE																						
High	n.a.	n.a.	6.598	-0.994	n.a.	n.a.	n.a.	1	0	0	n.a.	n.a.	n.a.						0.285	-0.952	0.018	0.097
Med-high	n.a.	n.a.	23.581	5.764	n.a.	n.a.	n.a.	5	0	0	n.a.	n.a.	n.a.						0.200	-0.312	0.136	0.007
Med	n.a.	n.a.	12.204	0.436	n.a.	n.a.	n.a.	2	-1	0	n.a.	n.a.	n.a.						0.018	-0.056	0.000	0.004
Med-low	n.a.	n.a.	6.072	-4.158	n.a.	n.a.	n.a.	5	0	0	n.a.	n.a.	n.a.						0.031	-0.129	-0.004	0.013
Low	n.a.	n.a.	17.056	-2.391	n.a.	n.a.	n.a.	2	1	0	n.a.	n.a.	n.a.						0.000	-0.025	0.000	0.000
High	n.a.	n.a.	12.501	4.558	n.a.	n.a.	n.a.	1	-1	0	n.a.	n.a.	n.a.									
Med-high	n.a.	n.a.	16.242	3.052	n.a.	n.a.	n.a.	4	1	0	n.a.	n.a.	n.a.									
Med	n.a.	n.a.	27.773	-1.802	n.a.	n.a.	n.a.	5	0	0	n.a.	n.a.	n.a.									
Med-low	n.a.	n.a.	19.916	-2.545	n.a.	n.a.	n.a.	1	0	0	n.a.	n.a.	n.a.									
Low	n.a.	n.a.	23.568	-3.263	n.a.	n.a.	n.a.	2	-1	0	n.a.	n.a.	n.a.									
Total	n.a.	n.a.	100.000	0.000	n.a.	n.a.	n.a.	5	0	0	n.a.	n.a.	n.a.	4.015	3.887	2.302	66.204	11.625	0.534	-1.489	0.151	0.121

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A17.2: Selected Sectors I - Malta

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
176	Manufacture of knitted and crocheted fabrics	3.372
321	Manufacture of electronic valves and tubes and other electronic components	3.188
222	Printing and service activities related to printing	3.072
365	Manufacture of games and toys	2.440
312	Manufacture of electricity distribution and control apparatus	1.525
Top-3 sectors (NACE 2-digit)		
22	Printing, publishing and reproduction	2.105
32	Radio, television and communication equipment	2.066
36	Furniture, jewellery, musical instruments, sports goods, games and toys	0.890

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
Top-3 sectors (NACE 2-digit)		
55	Hotels and restaurants	0.936
24	Chemicals and chemical products	0.432
50	Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of fuel	0.334

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
204	Manufacture of wooden containers	5.111
157	Manufacture of prepared animal feeds	3.780
355	Manufacture of other transport equipment n.e.c.	3.204
241	Manufacture of basic chemicals	2.918
296	Manufacture of weapons and ammunition	2.782
267	Cutting, shaping and finishing of stone	-3.215
293	Manufacture of agricultural and forestry machinery	-3.339
181	Manufacture of leather clothes	-4.349
160	Manufacture of tobacco products	-4.711
273	Other first processing of iron and steel and production of non-ECSC ferro-alloys	-5.990
The 3 winning and 3 losing sectors (NACE 2-digit)		
17	Textiles	1.293
20	Wood and products of wood and cork	1.130
24	Chemicals and chemical products	1.107
19	Leather, leather and footwear	-2.089
18	Wearing apparel, dressing and dyeing of fur	-2.429
16	Tobacco products	-4.711

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
The 3 winning and 3 losing sectors (NACE 2-digit)		
24	Chemicals and chemical products	1.301
70	Real estate activities	0.164
45	Construction	0.139
51	Wholesale trade and commission trade, except of motor vehicles and motorcycles	-0.129
25	Rubber and plastics	-0.188
55	Hotels and restaurants	-0.678

Source: Eurostat (SBS, Comext).

Table A17.3: Selected Sectors II - Malta

Revealed comparative advantage (RCA)

	RCA (export)			Export shares in price segments					
				Low				High	
	2010	Change 1999/2010	Change 2007/2010	2009 in %	Change 1999/2009	Change 2007/2009	2009 in %	Change 1999/2009	Change 2007/2009
Top-5 industries (NACE 3-digit)					in percentage points			in percentage points	
176 Manufacture of knitted and crocheted fabrics	3.372	2.110	0.607	100.000	100.000	0.000	0.000	0.000	0.000
321 Manufacture of electronic valves and tubes and other electronic components	3.188	0.091	-0.176	0.000	0.000	-0.005	100.000	100.000	0.005
222 Printing and service activities related to printing	3.072	0.783	0.123	0.369	0.346	-0.244	31.000	-68.930	27.735
365 Manufacture of games and toys	2.440	0.221	0.267	0.000	0.000	-0.054	99.752	99.752	-0.075
312 Manufacture of electricity distribution and control apparatus	1.525	0.504	0.062	6.269	6.269	-0.469	33.929	33.929	-7.380

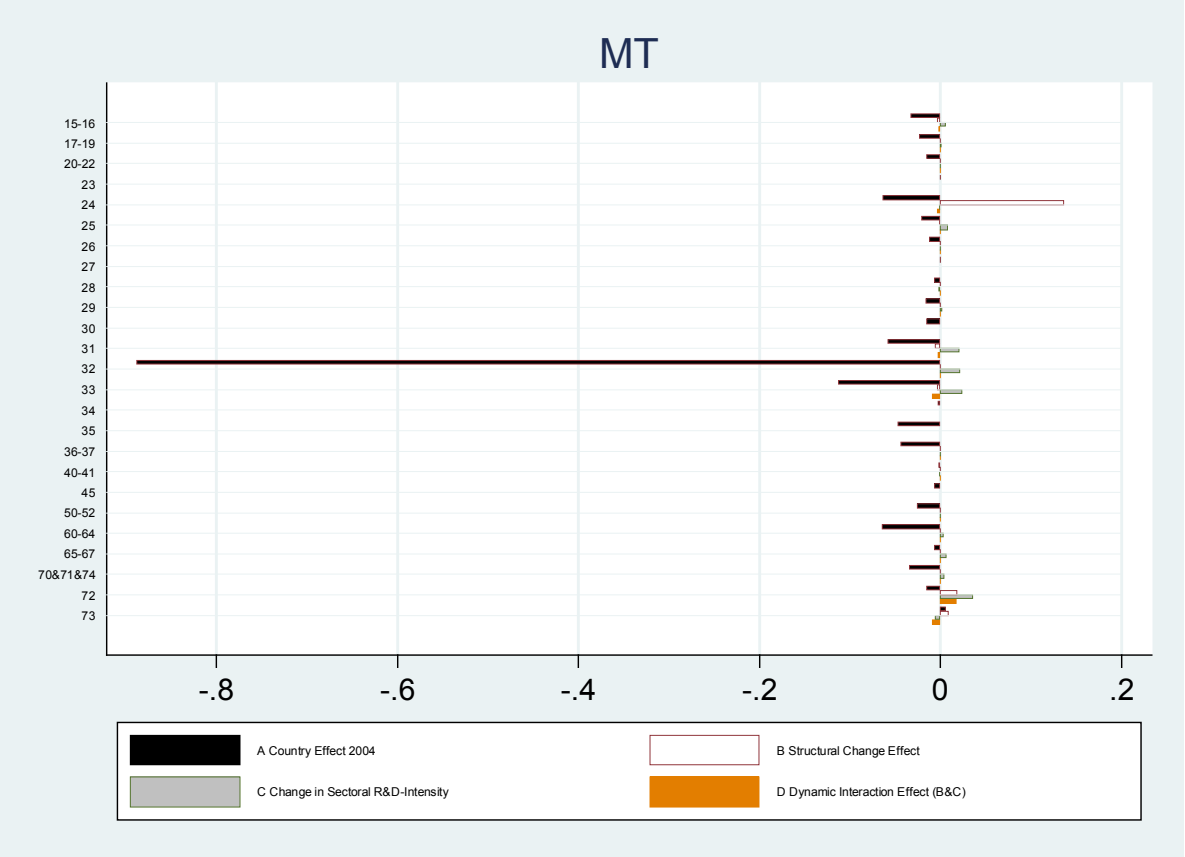
Relative value added (RVA)

	RVA		RCA (export)			Export shares in price segments					
							Low			High	
	2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Change 1999/2007	Change 2007/2009	2007	Change 1999/2007	Change 2007/2009
Top-5 industries (NACE 3-digit)							in percentage points			in percentage points	

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext)

Graph A17.3: Sectoral R&D decomposition: Change in structure, R&D intensity and interaction between structure and intensity, NACE-2-digit level



1.18. Netherlands

Trade and industry specialisation

At the detailed manufacturing industry level, the Netherlands are specialised in capital-intensive (man-made fibres, refined petroleum) and marketing-driven industries (prepared animal feeds, tobacco), in exports as well in technology-driven industries (computers, radio and TV transmitters). At the more aggregated sector level, the Netherlands feature specialisation in high and medium-high education sectors (computers, software, R&D and business services) and trade specialisation in high innovation intensive sectors, but also in medium-low sectors (tobacco) and value-added specialisation in low innovation-intensive sectors (water transport). The export share to the BRIC countries is low, indicating unused growth potential. However, the Netherlands feature an above average share of high growth firms in highly innovative sectors, pointing to strong business dynamism.

Export quality and sectoral R&D performance

Given its industrial structure, the Netherlands R&D intensity is above the EU average, while its position on the quality ladder is close to the EU average. Overall, the Netherlands form, together with the UK, France and Belgium a group of countries specialised in educationally intensive sectors, within the group of higher income countries specialised in knowledge-intensive industries.

Structural change

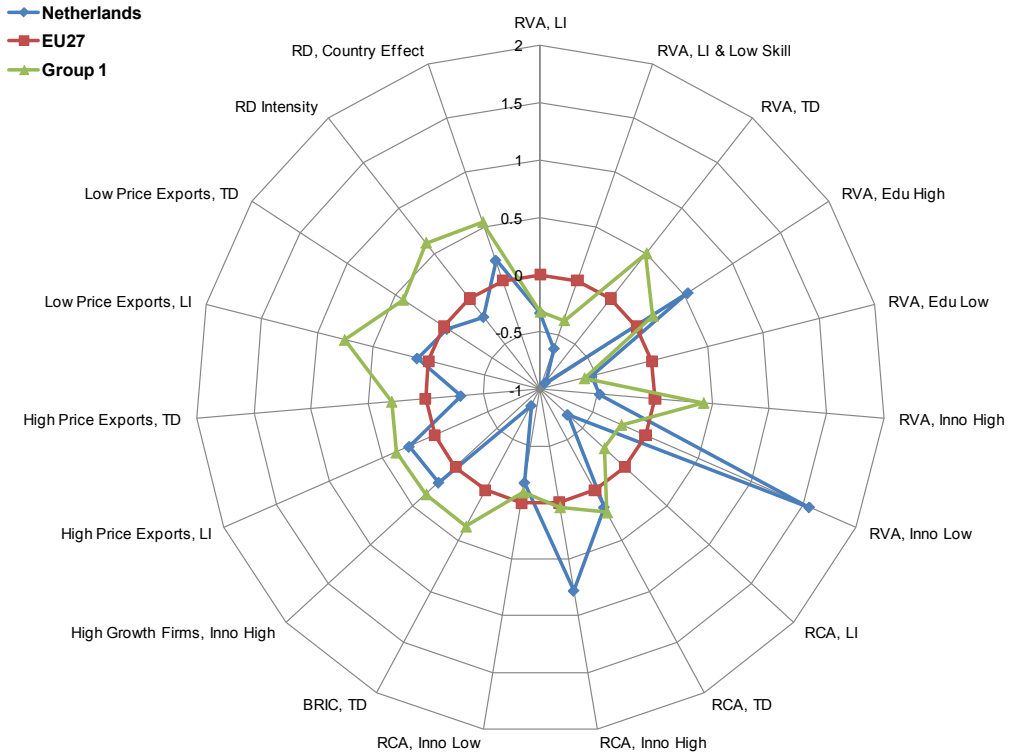
In terms of change, the Netherlands increased their specialisation in capital-intensive industries (man-made fibres) and in value added also in mainstream manufacturing (lighting equipment and electric lamps), as well as their trade specialisation in high innovation sectors (computers, communication equipment). They decreased their specialisation in high education sectors (R&D), low education sectors (water and inland transport), in labour-intensive industries and their relative shares in technology-driven industries (television and radio receivers). While the Netherlands have climbed up the quality ladder, they feature a decreasing R&D intensity, given their industrial structure. Sectoral R&D intensity falls considerably in computers and rises in communication equipment.

Overall, while the Netherlands' position with respect to competitiveness is still favourable, the pattern of change is clearly mixed.

Impact of the crisis

The impact of the crisis on the industrial structure of the Netherlands was limited, with a trend reversal only in labour-intensive industries (gaining in relative share).

Graph A18.1: Level



Graph A18.2: Change

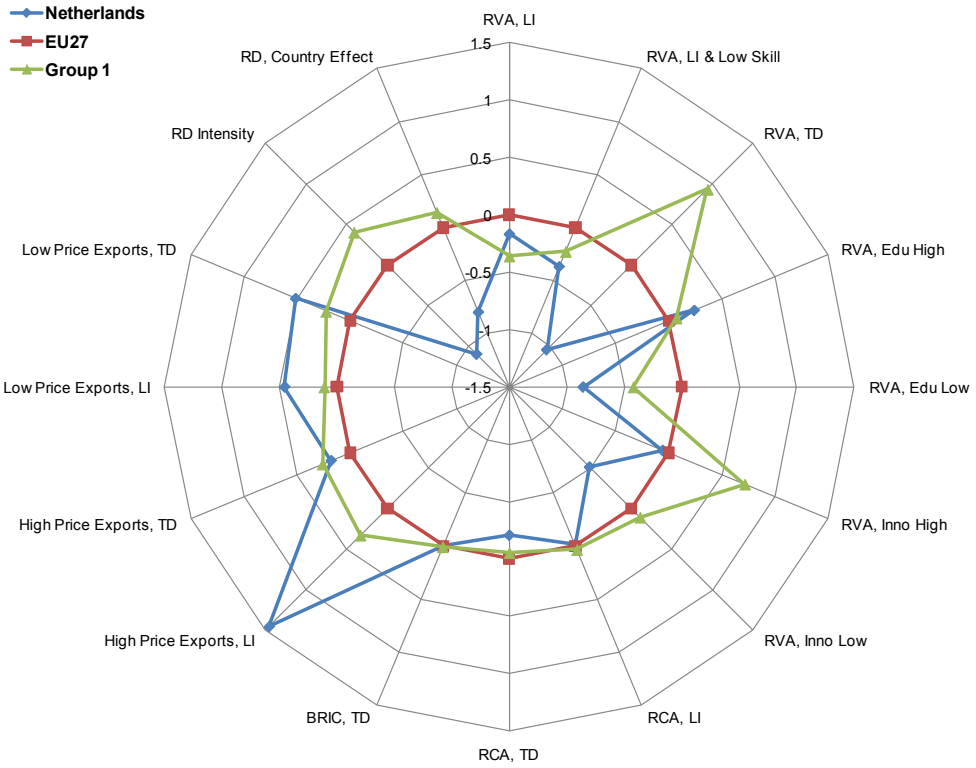


Table A18.1: Summary table - Netherlands

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2007	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
																Percentage points						
Factor inputs																						
Mainstream industries	-0.039	0.042									-0.435	-0.017	-0.014	0.927	0.642	0.099	38.084	25.334				
Labourintensive industries	-0.156	-0.022									-0.665	-0.011	0.028	0.115	0.023	-0.031	40.259	25.638				
Capital intensive industries	0.216	0.167									0.256	0.124	0.015	1.150	0.877	0.254	10.944	55.728				
Marketing driven industries	0.325	-0.028									0.212	-0.164	-0.049	0.502	0.143	0.116	24.447	32.196				
Technology driven industries	-0.466	-0.146									0.068	-0.055	-0.024	1.406	0.915	-0.041	39.843	15.872				
Skill intensity																						
Low skill industries	0.055	-0.043																				
Medium/blue collar workers	-0.190	0.020																				
Medium/white collar workers	0.200	0.036																				
High skill industries	-0.216	0.055																				
Labour intensive and low skill industries	-0.786	-0.154																				
Revealed quality elasticity																						
High RQE	-0.201	0.068									-0.334	0.051	-0.008	1.557	1.000	0.110	45.627	17.065				
Medium RQE	0.103	0.057									0.374	-0.049	0.037	1.309	0.806	0.150	23.020	34.760				
Low RQE	0.104	-0.142									0.038	0.004	-0.044	1.234	0.794	0.137	18.008	43.920				
											2009	Change 2004/2009	Change 2007/2009									
INNOTYPE																						
High	-0.209	-0.009	6.802	0.117	-0.001	3.958	0.116	2	0	-	0.253	0.022	0.016						0.522	0.133	0.001	0.129
Med-high	-0.241	0.065	10.582	0.318	-0.154	-0.948	-0.341	1	0	+	-0.165	0.026	-0.054						0.321	-0.180	-0.022	-0.014
Med	0.064	0.063	23.066	0.303	0.077	0.407	0.125	5	0	0	-0.273	-0.131	0.048						0.035	-0.041	-0.008	-0.017
Med-low	-0.004	-0.105	10.629	0.209	-0.035	-6.190	-0.555	1	0	0	0.390	-0.049	-0.009						0.118	-0.040	0.007	0.001
Low	0.274	-0.070	18.486	0.218	-0.076	-2.700	-0.233	1	0	0	-0.201	0.084	0.031						0.058	0.012	0.003	-0.016
EDUTYPE																						
High	0.143	0.029	22.585	1.749	0.094	0.665	0.129	5	0	0	0.451	-0.144	0.012									
Med-high	-0.001	0.068	9.681	-0.168	0.050	-0.250	-0.688	1	0	-	0.205	-0.024	-0.102									
Med	0.025	0.044	37.749	1.471	0.004	-3.531	-0.285	2	0	0	-0.604	0.006	-0.022									
Med-low	-0.050	-0.042	10.240	-2.114	-0.136	-1.909	-0.264	5	0	0	-0.153	0.180	0.107									
Low	-0.115	-0.097	19.746	-0.937	-0.304	1.709	-0.581	1	0	0	-0.083	0.010	0.022									
Total	0.000	0.000	100.000	0.000	-0.070	0.000	-0.204	3	0	0	0.000	0.000	0.000	4.100	2.599	0.398	29.378	31.185	1.073	-0.113	-0.019	0.078

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A18.2: Selected Sectors I - Netherlands

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
300	Manufacture of office machinery and computers	1.348
160	Manufacture of tobacco products	1.051
154	Manufacture of vegetable and animal oils and fats	1.038
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	0.945
232	Refined petroleum products	0.915
Top-3 sectors (NACE 2-digit)		
30	Office, accounting and computing machinery	1.348
16	Tobacco	1.051
23	Coke, refined petroleum and nuclear fuel	0.876

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
160	Manufacture of tobacco products	1.938
355	Manufacture of other transport equipment n.e.c.	1.604
247	Manufacture of man-made fibres	1.414
351	Building and repairing of ships and boats	0.954
157	Manufacture of prepared animal feeds	0.889
Top-3 sectors (NACE 2-digit)		
160	Manufacture of tobacco products	1.688
61	Water transport	0.837
62	Air transport	0.817

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	1.339
183	Dressing and dyeing of fur; manufacture of articles of fur	0.997
267	Cutting, shaping and finishing of stone	0.932
247	Manufacture of man-made fibres	0.877
363	Manufacture of musical instruments	0.804
264	Manufacture of bricks, tiles and construction products	-0.913
283	Manufacture of steam generators, except central heating hot water boilers	-0.969
352	Manufacture of railway, tramway locomotives, rolling stock	-1.091
296	Manufacture of weapons and ammunition	-1.535
231	Coke oven products	-2.358
The 3 winning and 3 losing sectors (NACE 2-digit)		
32	Radio, television and communication equipment	0.469
36	Furniture, jewellery, musical instruments, sports goods, games and toys	0.246
19	Leather, leather and footwear	0.243
16	Tobacco	-0.403
34	Motor vehicles, trailers and semi-trailers	-0.430
20	Wood and of wood and cork	-0.444

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
247	Manufacture of man-made fibres	2.912
16	Manufacture of tobacco products	1.743
315	Manufacture of lighting equipment and electric lamps	1.342
355	Manufacture of other transport equipment n.e.c.	1.114
23	Manufacture of coke, refined petroleum products and nuclear fuel	0.848
313	Manufacture of insulated wire and cable	-0.452
156	Manufacture of grain mill products, starches and starch products	-0.511
223	Reproduction of recorded media	-0.633
154	Manufacture of vegetable and animal oils and fats	-1.155
323	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	-5.541
The 3 winning and 3 losing sectors (NACE 2-digit)		
16	Tobacco products	3.137
62	Air transport	0.982
23	Coke, refined petroleum and nuclear fuel	0.669
73	Research and development	-0.530
32	Radio, television and communication equipment	-0.543
41	Water supply	-0.765

Source: Eurostat (SBS, Comext).

Table A18.3: Selected Sectors II - Netherlands

Revealed comparative advantage (RCA)

		RCA (export)			Export shares in price segments					
		2010	Change 1999/2010	Change 2007/2010	2009 in %	Low Change 1999/2009	Change 2007/2009	2009 in %	High Change 1999/2009	Change 2007/2009
Top-5 industries (NACE 3-digit)						in percentage points			in percentage points	
300	Manufacture of office machinery and computers	1.348	0.198	0.142	13.857	-21.820	0.476	24.560	0.790	-8.796
160	Manufacture of tobacco products	1.051	-0.403	-0.229	9.931	7.072	6.439	66.286	-13.231	5.833
154	Manufacture of vegetable and animal oils and fats	1.038	-0.010	0.028	60.909	-8.947	-8.060	2.899	0.490	1.095
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	0.945	1.339	0.311	12.348	6.124	-15.382	81.772	39.376	62.512
232	Refined petroleum products	0.915	-0.111	0.042	68.764	-0.060	18.840	4.384	-1.302	0.761

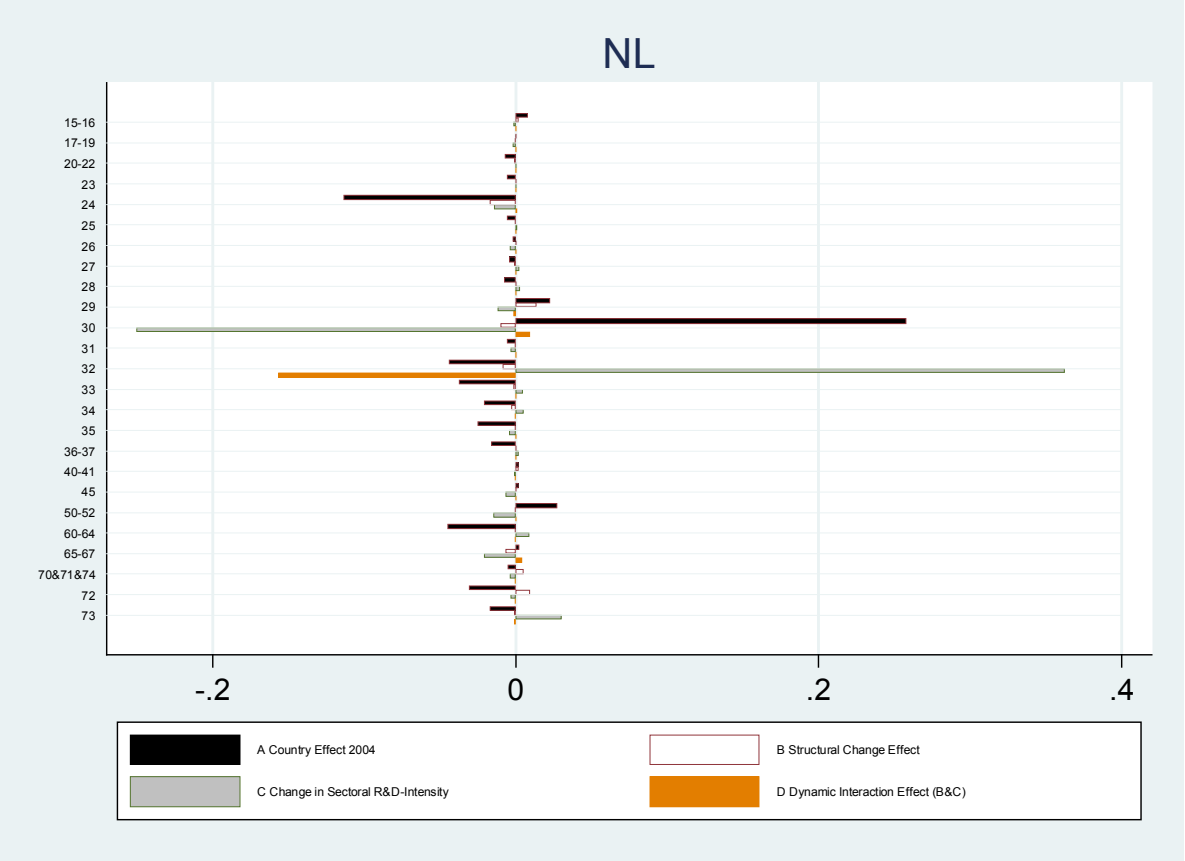
Relative value added (RVA)

		RVA		RCA (export)			Export shares in price segments					
		2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Low Change 1999/2007	Change 2007/2009	2007	High Change 1999/2007	Change 2007/2009
Top-5 industries (NACE 3-digit)								in percentage points			in percentage points	
16	Manufacture of tobacco products	6.942	1.601	1.280	-0.174	-0.229	-	-	-	-	-	-
355	Manufacture of other transport equipment n.e.c.	4.971	2.056	-0.569	0.405	0.052	92.821	29.041	-9.704	2.184	-0.848	1.802
247	Manufacture of man-made fibres	4.113	3.091	0.282	0.889	-0.012	10.380	1.754	-0.263	65.098	15.661	11.154
351	Building and repairing of ships and boats	2.596	0.248	-0.015	0.259	-0.232	6.851	2.332	25.015	54.574	16.126	-9.178
157	Manufacture of prepared animal feeds	2.434	-0.344	0.900	-0.092	-0.140	62.965	-9.791	10.562	5.681	1.781	1.556

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext).

Graph A18.3: Sectoral R&D decomposition: Change in structure, R&D intensity and interaction between structure and intensity, NACE-2-digit level



1.19. Austria

Trade and industry specialisation

At the detailed manufacturing industry level, Austria features specialisation in mainstream manufacturing (manufacture of railway and rolling stock, electric motors) and labour-intensive industries (builders' carpentry and joinery, sawmilling, machine-tools), in valued added as well in capital-intensive industries (man-made fibres), in exports as well in marketing-driven industries (sports goods, beverages). At the more aggregated sector level, Austria is specialised in highly innovation-intensive sectors such as machinery and, in exports, in medium-innovation sectors (such as wood, basic and fabricated metals), but also in low innovation and education sectors such as in hotels and restaurants and auxiliary transport activities. Its share of exports to BRIC countries is below the EU average, indicating unused growth potential.

Export quality and sectoral R&D performance

Austria's R&D intensity is very high given its industrial structure, and its position on the quality ladder is high across industries and quality segments. Overall, Austria shows like Denmark that competitiveness can be sustained in structures which are not markedly knowledge-intensive, if sectoral upgrading in terms of R&D and quality takes place, i.e. if a country moves to the knowledge-creating parts of the value chain.

Structural change

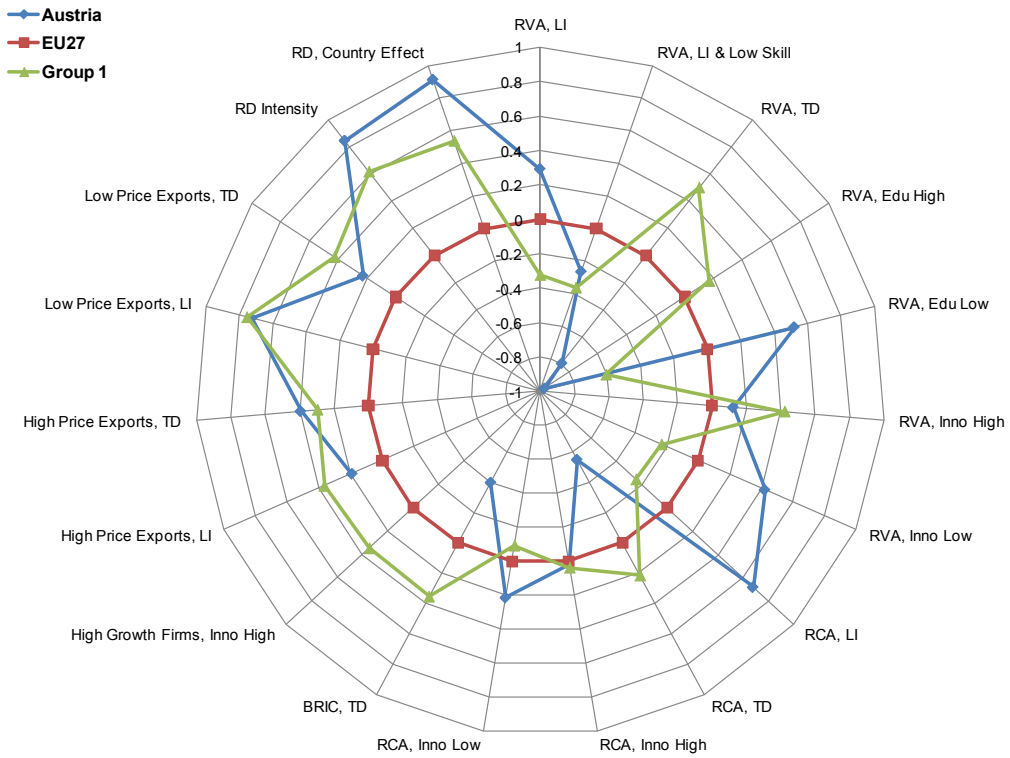
In terms of change, Austria has increased its industry specialisation in mainstream manufacturing (motorcycles, steam generators) and labour-intensive industries (veneer sheets, made-up textile articles, machine-tools), as well as in high innovation and high education sectors (computers, electrical machinery, communication equipment). Austria has increased its R&D intensity taking account of its industrial structure and overall maintained its position on the quality ladder.

Overall, Austria's competitive position is favourable, with trends mostly going in the right direction both in terms of specialisation and sectoral upgrading.

Impact of the crisis

The crisis has slowed structural change towards technology-driven industries in Austria, while also boosting labour-intensive industries.

Graph A19.1: Level



Graph A19.2: Change

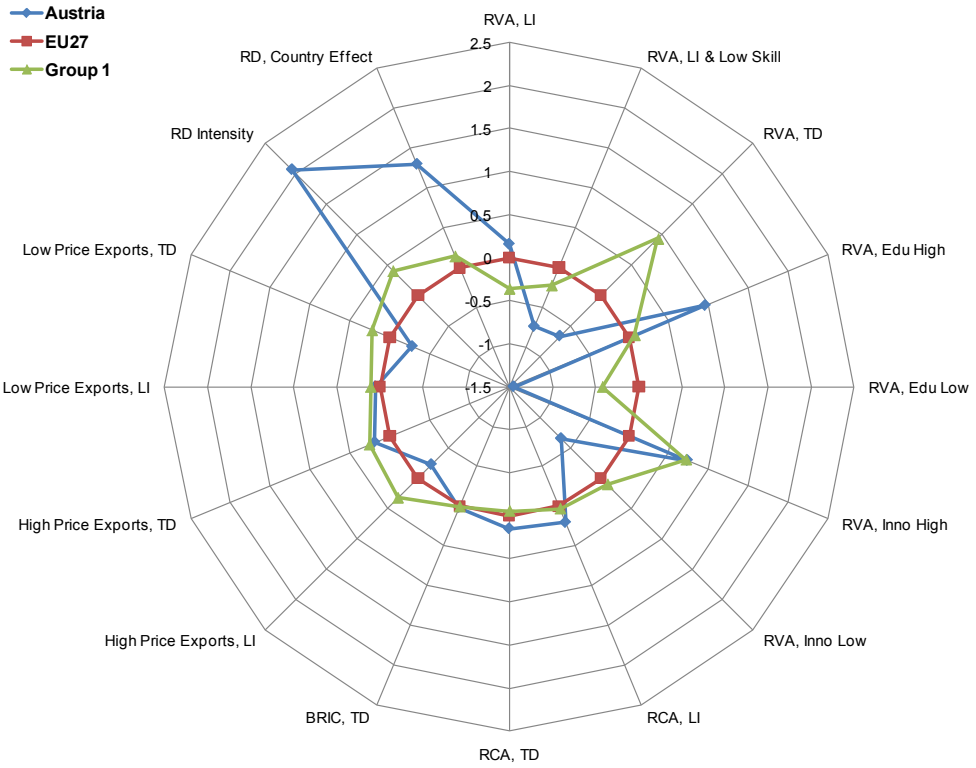


Table A19.1: Summary table - Austria

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2007	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
															Percentage points							
Factor inputs																						
Mainstream industries	0.208	0.119									0.260	-0.005	-0.004	2.255	1.350	0.318	36.544	22.973				
Labourintensive industries	0.119	0.015									0.397	0.075	0.060	0.849	0.629	0.296	39.382	20.286				
Capital intensive industries	0.116	-0.109									-0.172	-0.144	0.037	0.688	0.530	0.172	18.386	30.207				
Marketing driven industries	-0.182	-0.081									0.043	0.112	-0.004	0.455	0.282	0.010	37.856	27.402				
Technology driven industries	-0.383	-0.089									-0.265	0.059	-0.015	1.909	1.294	0.593	54.923	11.135				
Skill intensity																						
Low skill industries	-0.023	-0.089																				
Medium/blue collar workers	0.083	0.012																				
Medium/white collar workers	-0.029	-0.011																				
High skill industries	-0.042	0.175																				
Labour intensive and low skill industries	-0.262	-0.183																				
Revealed quality elasticity																						
High RQE	-0.130	0.018									-0.036	0.006	-0.037	3.584	2.273	0.808	49.579	14.450				
Medium RQE	0.016	-0.023									-0.044	0.022	0.028	1.371	0.991	0.283	34.610	22.893				
Low RQE	0.141	0.006									0.100	-0.042	0.036	1.201	0.820	0.298	23.630	32.199				
INNOTYPE											2009	Change 2004/2009	Change 2007/2009									
High	0.048	0.102	8.220	0.105	-0.206	-0.988	n.a.	2	0	0	0.007	0.017	0.002						1.039	0.333	-0.119	0.137
Med-high	-0.046	-0.030	11.891	0.298	-0.265	1.100	n.a.	2	0	0	-0.131	-0.048	-0.029						0.511	-0.050	0.068	0.017
Med	-0.060	0.096	19.308	0.987	-0.225	-1.196	n.a.	3	1	0	0.203	-0.036	0.003						0.094	0.000	0.003	0.001
Med-low	-0.088	-0.150	8.125	-1.797	-0.465	0.692	n.a.	2	-1	+	-0.066	0.098	-0.021						0.217	0.076	0.000	0.038
Low	0.082	-0.106	14.998	0.209	-0.113	1.161	n.a.	4	2	-	0.199	0.150	0.112						0.094	0.068	-0.001	0.055
EDUTYPE																						
High	-0.326	0.203	14.869	1.660	-0.196	-2.245	n.a.	4	0	0	-0.391	0.050	0.052									
Med-high	-0.143	-0.026	6.606	-0.746	-0.172	3.623	n.a.	2	-2	0	-0.461	-0.078	0.020									
Med	0.072	0.137	38.431	2.051	-0.279	-0.087	n.a.	3	0	0	0.129	-0.021	-0.044									
Med-low	0.017	-0.176	11.191	-2.370	-0.164	1.244	n.a.	4	1	0	0.230	0.085	0.075									
Low	0.100	-0.130	28.904	-0.595	-0.276	0.311	n.a.	1	0	0	0.315	0.063	0.044									
Total	0.000	0.000	100.000	0.000	-0.228	0.000	n.a.	2	-1	0	0.000	0.000	0.000	6.156	4.085	1.389	38.403	21.636	1.969	0.422	-0.048	0.248

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A19.2: Selected Sectors I - Austria

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
203	Manufacture of builders' carpentry and joinery	1.745
352	Manufacture of railway, tramway locomotives, rolling stock	1.619
201	Sawmilling and planing of wood, impregnation of wood	1.381
202	Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board and other	1.286
364	Manufacture of sports goods	1.267
Top-3 sectors (NACE 2-digit)		
20	Wood and products of wood and cork	1.315
28	Fabricated metal	0.594
26	Non-metallic mineral products	0.426

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
355	Manufacture of other transport equipment n.e.c.	2.324
364	Manufacture of sports goods	1.614
247	Manufacture of man-made fibres	1.612
365	Manufacture of games and toys	1.393
311	Manufacture of electric motors, generators and transformers	1.234
Top-3 sectors (NACE 2-digit)		
20	Wood and products of wood and cork	0.873
23	Coke, refined petroleum and nuclear fuel	0.651
27	Basic metals	0.603

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	1.077
152	Processing and preserving of fish and fish products	1.062
354	Manufacture of motorcycles and bicycles	0.761
283	Manufacture of steam generators, except central heating hot water boilers	0.756
156	Manufacture of grain mill products, starches and starch products	0.728
192	Manufacture of luggage, handbags and the like, saddler	-1.040
296	Manufacture of weapons and ammunition	-1.093
247	Manufacture of man-made fibres	-1.101
233	Nuclear fuel	-2.101
231	Coke oven products	-2.653
The 3 winning and 3 losing sectors (NACE 2-digit)		
30	Office, accounting and computing machinery	0.475
15	Food and beverages	0.344
32	Radio, television and communication equipment	0.214
22	Printing, publishing and reproduction	-0.251
19	Leather, leather and footwear	-0.297
16	Tobacco	-0.530

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
355	Manufacture of other transport equipment n.e.c.	7.227
247	Manufacture of man-made fibres	2.591
365	Manufacture of games and toys	1.983
311	Manufacture of electric motors, generators and transformers	1.711
354	Manufacture of motorcycles and bicycles	1.224
323	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	-0.800
313	Manufacture of insulated wire and cable	-0.883
271	Manufacture of basic iron and steel and of ferro-alloys (ECSC)	-0.964
16	Manufacture of tobacco products	-1.086
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	-1.352
The 3 winning and 3 losing sectors (NACE 2-digit)		
70	Real estate activities	0.623
31	Electrical machinery and apparatus, nec	0.594
71	Renting of machinery and equipment	0.371
16	Tobacco products	-0.429
60	Inland transport	-0.508
32	Radio, television and communication equipment	-0.768

Source: Eurostat (SBS, Comext).

Table A19.3: Selected Sectors II - Austria

Revealed comparative advantage (RCA)

		RCA (export)			Export shares in price segments					
		2010	Change 1999/2010	Change 2007/2010	2009 in %	Low Change 1999/2009	Change 2007/2009	2009 in %	High Change 1999/2009	Change 2007/2009
Top-5 industries (NACE 3-digit)						in percentage points			in percentage points	
203	Manufacture of builders' carpentry and joinery	1.745	0.428	0.157	59.534	29.436	3.019	29.459	-5.283	2.352
352	Manufacture of railway, tramway locomotives, rolling stock	1.619	-0.101	0.042	5.112	1.541	1.979	42.110	-34.041	4.259
201	Sawmilling and planing of wood, impregnation of wood	1.381	-0.144	-0.002	69.148	8.891	-16.734	5.991	3.288	4.473
202	Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board and other	1.286	0.113	0.080	11.095	1.961	-2.969	12.103	-6.222	6.110
364	Manufacture of sports goods	1.267	-0.348	0.132	4.646	1.227	0.843	71.758	-22.748	12.875

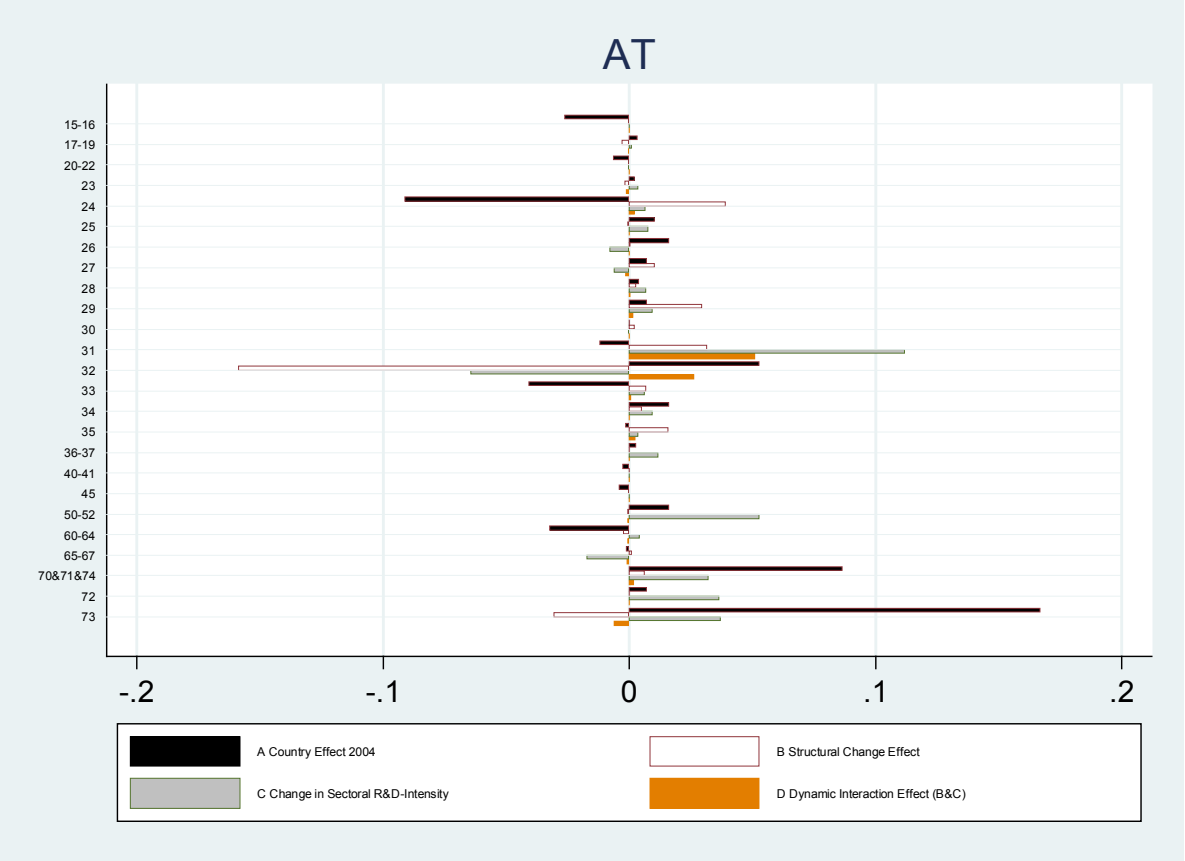
Relative value added (RVA)

		RVA		RCA (export)			Export shares in price segments				
		2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Low Change 1999/2007	Change 2007/2009	2007	High Change 1999/2007	Change 2007/2009
Top-5 industries (NACE 3-digit)								in percentage points			in percentage points	
355	Manufacture of other transport equipment n.e.c.	10.215	9.163	-0.487	0.220	0.045	58.019	56.937	-1.483	35.981	-32.494	-4.764
364	Manufacture of sports goods	5.024	-0.378	1.135	-0.480	0.132	3.803	0.384	0.843	58.883	-35.623	12.875
247	Manufacture of man-made fibres	5.014	2.809	-0.846	-0.193	-0.908	4.768	-12.153	-1.487	33.131	-28.535	46.537
365	Manufacture of games and toys	4.026	1.861	0.477	-0.071	-0.171	1.190	0.662	-0.967	95.232	7.093	-8.018
311	Manufacture of electric motors, generators and transformers	3.434	1.713	0.574	0.009	0.015	14.236	-1.496	-1.733	55.751	-3.354	-5.885

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext)

Graph A19.3: Sectoral R&D decomposition: Change in structure, R&D intensity and interaction between structure and intensity, NACE-2-digit level



1.20. Poland

Trade and industry specialisation

At the detailed manufacturing industry level, Poland shows negative specialisation in technology-driven industries, but otherwise is specialised in most of the other industry types, such as marketing-driven (processing and preserving of fruit and vegetables, soap and detergents), labour-intensive (wood products, leather clothes) and mainstream manufacturing industries (domestic appliances, lighting, batteries). At the more aggregated sector level, Poland features negative specialisation in the high innovation and high and medium-high education sectors. Otherwise it shows above average relative shares in the low to medium (medium-high in innovation intensity) segments of these sectors, such as in tobacco, wood, non-metallic minerals, as well as in textiles and rubber and plastics (medium-high innovation intensity).

Export quality and sectoral R&D performance

Poland's R&D intensity is below average, taking account of its industrial structure, as is its position on the quality ladder as evidenced by low shares in high price segments and high shares in low price segments across industries. This upgrading profile is very similar to its group of lower income countries featuring trade specialisation in knowledge-intensive industries (group 3), while in terms of specialisation Poland really is between countries specialised in labour-intensive (group 4) and countries specialised in knowledge-intensive industries. However, Poland shows a much less negative trade specialisation in technology-driven industries, a much less positive specialisation in labour-intensive industries and a higher relative share in mainstream manufacturing than group 4, making its structure more akin to group 3.

Structural change

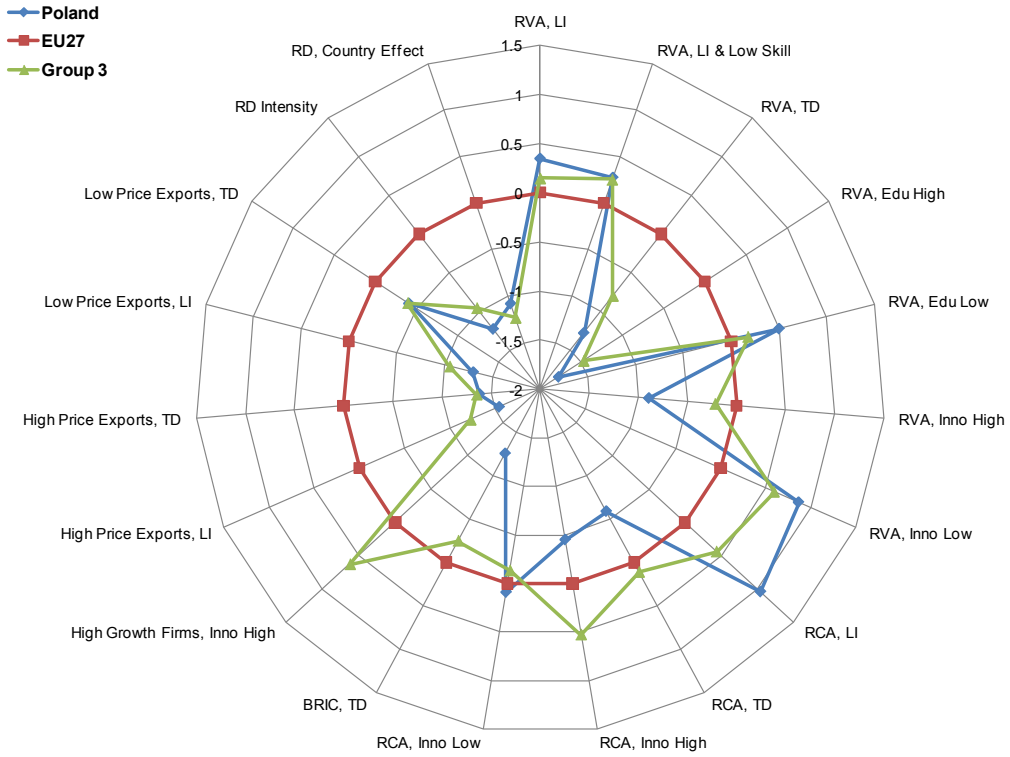
In terms of change, Poland strongly increased its relative shares in technology-driven industries (computers, optical instruments) and in mainstream manufacturing (domestic appliances), as well as its exports in high education and high innovation sectors (computers, communication equipment) while it decreased its specialisation in labour-intensive industries (leather clothes, wearing apparel). Poland is moving out of the low quality segments of exports, while it does not yet make inroads into the high quality segments. Its R&D intensity is decreasing relative to the average, taking account of its industrial structure.

Overall, Poland is clearly catching up with respect to competitiveness; its pattern of change establishes it more firmly in country group 3. However, R&D investments do not yet follow the positive trend.

Impact of the crisis

The impact of the crisis on Poland's economic structure was limited, with only a trend reversal in mainstream manufacturing.

Graph A20.1: Level



Graph A20.2: Change

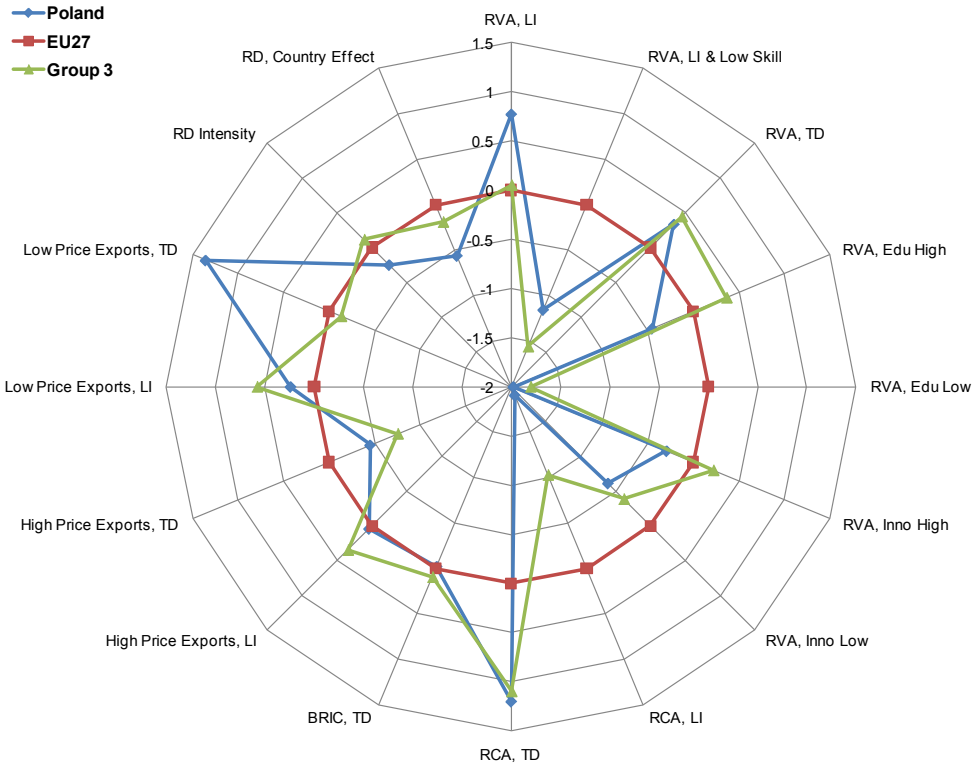


Table A20.1: Summary table - Poland

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2007	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
Factor inputs																						
Mainstream industries	0.035	0.227									0.054	0.051	-0.054	1.679	0.800	-0.544	7.871	62.922				
Labourintensive industries	0.140	0.077									0.560	-0.445	-0.096	0.601	0.238	-0.135	10.254	63.074				
Capital intensive industries	0.161	-0.123									-0.116	-0.135	-0.033	1.317	0.680	0.326	7.016	46.809				
Marketing driven industries	0.189	-0.196									0.203	0.136	0.055	1.215	-0.017	0.107	14.998	58.753				
Technology driven industries	-0.717	0.067									-0.286	0.627	0.172	0.928	0.552	0.231	16.756	39.835				
Skill intensity																						
Low skill industries	0.327	-0.130																				
Medium/blue collar workers	0.065	0.268																				
Medium/white collar workers	-0.207	-0.056																				
High skill industries	-0.603	0.116																				
Labour intensive and low skill industries	0.215	-0.177																				
Revealed quality elasticity																						
High RQE	-0.282	-0.251									-0.381	0.080	-0.017	1.729	0.946	-0.060	14.111	37.320				
Medium RQE	0.077	0.081									0.212	0.028	0.029	1.728	0.281	-0.109	14.213	61.488				
Low RQE	0.215	0.166									0.273	-0.129	-0.009	2.282	1.025	0.154	6.316	61.360				
											2009	Change 2004/2009	Change 2007/2009									
INNOTYPE																						
High	-0.432	-0.061	5.510	-0.264	n.a.	n.a.	n.a.	5	0	0	-0.181	0.260	0.063						0.114	-0.305	0.018	-0.006
Med-high	0.174	-0.053	13.347	1.823	n.a.	n.a.	n.a.	5	0	0	0.001	-0.078	-0.011						0.044	-0.456	-0.001	-0.008
Med	-0.292	0.095	16.845	1.008	n.a.	n.a.	n.a.	3	1	0	0.119	-0.132	-0.045						0.015	-0.072	0.000	0.003
Med-low	0.443	-0.153	11.654	0.849	n.a.	n.a.	n.a.	5	0	0	0.183	0.120	-0.020						0.017	-0.148	0.000	0.004
Low	0.162	-0.093	17.190	-1.668	n.a.	n.a.	n.a.	3	0	0	0.094	-0.080	-0.013						0.003	-0.046	0.000	-0.001
EDUTYPE																						
High	-0.713	-0.120	13.021	0.662	n.a.	n.a.	n.a.	2	0	0	-0.614	0.831	0.473									
Med-high	-0.256	-0.298	5.718	0.306	n.a.	n.a.	n.a.	4	-1	0	-0.445	0.011	0.021									
Med	0.129	0.167	36.032	1.184	n.a.	n.a.	n.a.	5	0	0	0.187	0.075	0.057									
Med-low	0.179	0.185	18.310	0.540	n.a.	n.a.	n.a.	1	0	0	0.514	-0.053	-0.034									
Low	0.097	-0.174	26.918	-2.693	n.a.	n.a.	n.a.	1	0	0	0.206	-0.115	-0.068									
Total	0.000	0.000	100.000	0.000	n.a.	n.a.	n.a.	4	0	0	0.000	0.000	0.000	5.739	2.253	-0.015	11.549	53.515	0.197	-1.047	0.017	-0.006

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A20.2: Selected Sectors I - Poland

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
231	Coke oven products	2.864
204	Manufacture of wooden containers	1.545
205	Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials	1.471
361	Manufacture of furniture	1.432
323	Manuf. of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	1.369
Top-3 sectors (NACE 2-digit)		
16	Tobacco products	1.165
36	Furniture, jewellery, musical instruments, sports goods, games and toys	0.783
20	Wood and of wood and cork	0.777

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
202	Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board	1.108
181	Manufacture of leather clothes	0.901
153	Processing and preserving of fruit and vegetables	0.867
265	Manufacture of cement, lime and plaster	0.846
205	Manufacture of other products of wood; manufacture of articles of cork, straw/plaiting materials	0.731
Top-3 sectors (NACE 2-digit)		
26	Furniture, jewellery, musical instruments, sports goods, games and toys	0.706
41	Water supply	0.691
20	Wood and products of wood and cork	0.654

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
300	Manufacture of office machinery and computers	2.591
160	Manufacture of tobacco products	2.116
263	Manufacture of ceramic tiles and flags	1.500
334	Manufacture of optical instruments, photographic equipment	1.290
297	Manufacture of domestic appliances n.e.c.	1.273
365	Manufacture of games and toys	-1.081
192	Manufacture of luggage, handbags and the like, saddler	-1.158
182	Manufacture of other wearing apparel and accessories	-1.275
265	Manufacture of cement, lime and plaster	-1.398
181	Manufacture of leather clothes	-2.072
The 3 winning and 3 losing sectors (NACE 2-digit)		
30	Office, accounting and computing machinery	2.591
16	Tobacco products	2.116
32	Radio, television and communication equipment	0.794
20	Wood and products of wood and cork	-0.510
19	Leather, leather and footwear	-0.903
18	Wearing apparel, dressing and dyeing of fur	-1.265

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
297	Manufacture of domestic appliances n.e.c.	1.000
343	Manufacture of parts, accessories for motor vehicles	0.915
268	Manufacture of other non-metallic mineral products	0.890
263	Manufacture of ceramic tiles and flags	0.839
273	Other first processing of iron and steel and production of non-ECSC ferro-alloys	0.782
181	Manufacture of leather clothes	-0.756
351	Building and repairing of ships and boats	-1.709
159	Manufacture of beverages	-2.190
23	Manufacture of coke, refined petroleum products and nuclear fuel	-3.576
160	Manufacture of tobacco products	-10.183
The 3 winning and 3 losing sectors (NACE 2-digit)		
37	Recycling	1.118
70	Real estate activities	1.043
25	Rubber and plastics	0.504
73	Research and development	-1.657
23	Coke, refined petroleum and nuclear fuel	-4.383
16	Tobacco products	-5.919

Source: Eurostat (SBS, Comext).

Table A20.3: Selected Sectors II - Poland

Revealed comparative advantage (RCA)

		RCA (export)			Export shares in price segments					
					Low			High		
		2010	Change 1999/2010	Change 2007/2010	2009 in %	Change 1999/2009	Change 2007/2009	2009 in %	Change 1999/2009	Change 2007/2009
Top-5 industries (NACE 3-digit)						in percentage points			in percentage points	
231	Coke oven products	2.864	-0.341	-0.007	92.928	-0.848	-4.019	0.344	-0.107	0.300
204	Manufacture of wooden containers	1.545	-0.609	-0.203	96.032	-2.743	6.400	0.611	0.548	0.218
205	Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials	1.471	-0.516	-0.123	97.586	-0.608	1.591	0.187	-0.133	-0.098
361	Manufacture of furniture	1.432	-0.190	-0.028	92.292	-0.432	10.319	1.873	-0.299	-0.832
323	Manuf. of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	1.369	0.674	0.334	55.815	-24.564	16.040	0.527	-2.894	-0.379

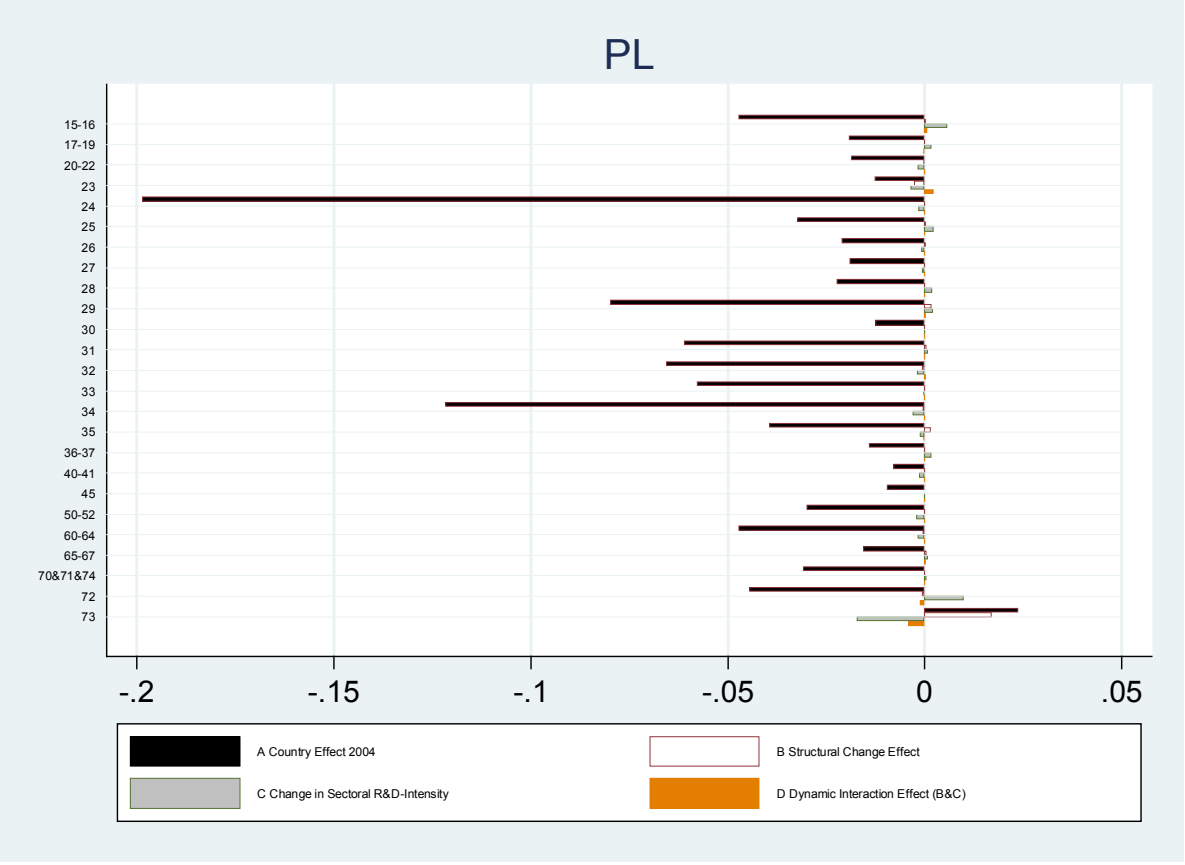
Relative value added (RVA)

		RVA		RCA (export)			Export shares in price segments					
							Low			High		
		2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Change 1999/2007	Change 2007/2009	2007	Change 1999/2007	Change 2007/2009
Top-5 industries (NACE 3-digit)								in percentage points			in percentage points	
202	Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board	3.028	-0.375	0.732	-0.538	-0.104	50.307	-29.343	23.902	2.809	2.549	-1.953
181	Manufacture of leather clothes	2.463	-0.430	-0.774	-1.340	-0.731	5.491	4.647	2.278	58.202	52.127	-58.202
153	Processing and preserving of fruit and vegetables	2.381	0.211	0.827	-0.388	-0.195	44.294	-13.902	13.239	26.462	15.354	-18.493
265	Manufacture of cement, lime and plaster	2.330	-0.041	-0.258	-1.356	-0.042	49.201	-45.939	1.805	7.017	6.351	12.448
205	Manufacture of other products of wood; manufacture of articles of cork, straw/plaiting materials	2.076	0.412	1.594	-0.394	-0.123	95.995	-2.199	1.591	0.285	-0.034	-0.098

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext).

Graph A20.3: Sectoral R&D decomposition: Change in structure, R&D intensity and interaction between structure and intensity, NACE-2-digit level



1.21. Portugal

Trade and industry specialisation

At the detailed manufacturing industry level, Portugal is highly specialised in labour-intensive (low-skill) industries (wood and cork, cutting and finishing of stone, made-up textile articles), as well as in capital-intensive (cement, refined petroleum) and marketing-driven industries (footwear). At the more aggregated sector level, Portugal features specialisation in low and medium-low innovation and education sectors (wood and cork, leather, wearing apparel). Its share of exports to the BRIC countries is low.

Export quality and sectoral R&D performance

Portugal's R&D intensity is slightly below average given its industry structure, while its position on the quality ladder is clearly below the EU average. While Portugal is very similar to its group of higher income countries specialised in labour-intensive countries in terms of specialisation, in terms of sectoral upgrading it shows better R&D, but poorer quality performance.

Structural change

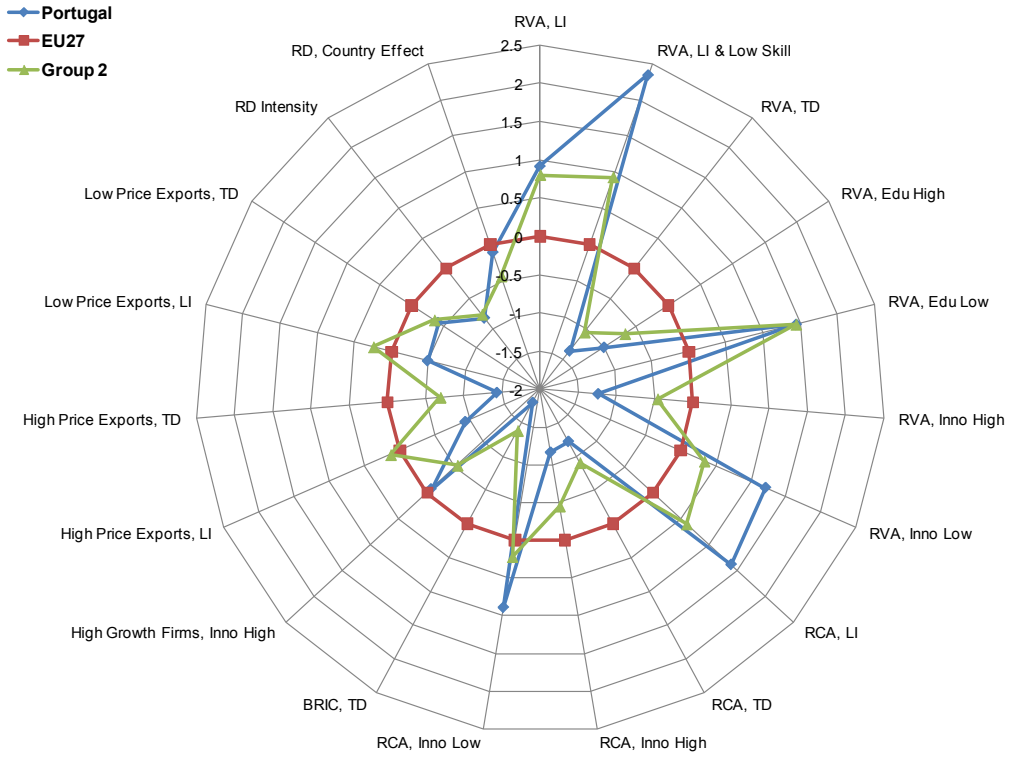
In terms of change, Portugal features decreasing specialisation in labour-intensive (textile weaving, other wearing apparel and accessories) and technology-driven industries (electronic valves, electrical equipment), but increasing specialisation in capital-intensive (cement, articles of concrete and cement, refined petroleum) and marketing-driven industries (luggage and handbags). At the sector level, the relative share of high education sectors increased (computers, research and development, software, business services), while developments in high innovation sectors are split between trade (decreasing) and value added (increasing). Specialisation in low innovation and education sectors is unequivocally decreasing (e.g. wearing apparel, hotels and restaurants). Portugal features a substantially improving R&D intensity, taking account of industrial structure, and moves into higher quality segments across industries. However, the share of low quality segments is also rising.

Overall, Portugal faces an unfavourable competitive position, while the pattern of change is mixed, with some areas improving (knowledge-intensive services, R&D, high-quality segments) but others deteriorating (knowledge-intensive manufacturing, low quality segments).

Impact of the crisis

The impact of the crisis on Portugal's economic structure was limited, with only technology-driven industries declining even at a faster rate than before the crisis.

Graph A21.1: Level



Graph A21.2: Change

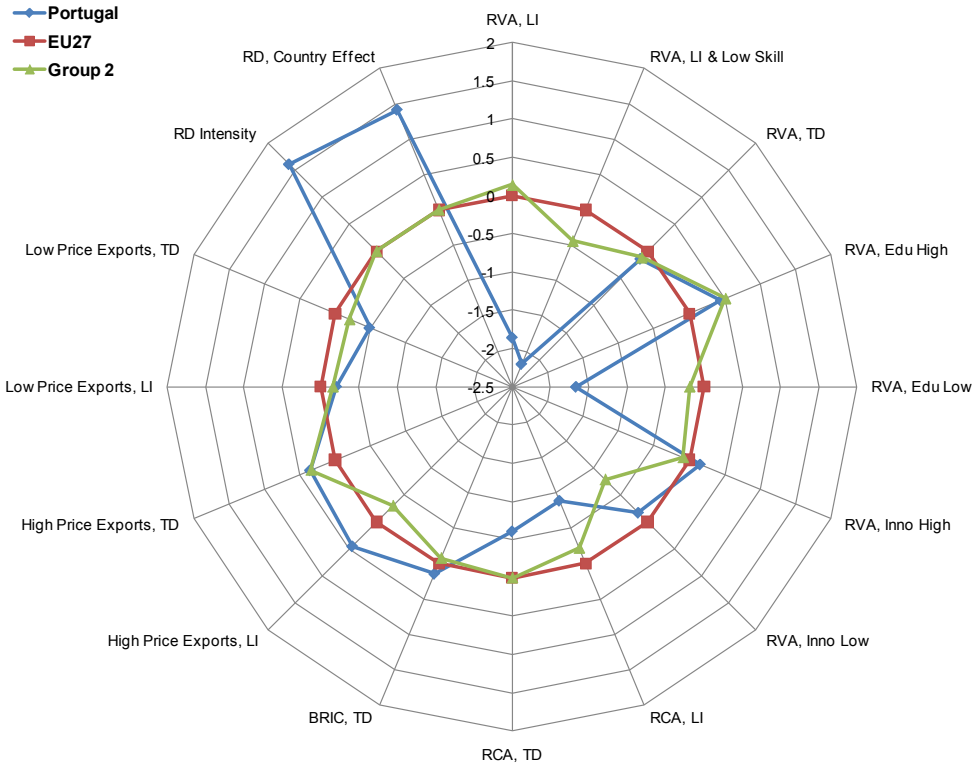


Table A21.1: Summary table - Portugal

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2007	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
																Percentage points						
Factor inputs																						
Mainstream industries	-0.168	-0.054									-0.010	0.180	0.058	0.441	0.246	0.163	11.947	50.410				
Labourintensive industries	0.335	-0.138									0.692	-0.206	-0.034	0.299	0.136	0.090	20.508	34.200				
Capital intensive industries	0.256	0.218									0.168	0.417	0.194	0.367	0.265	0.151	6.106	54.560				
Marketing driven industries	0.158	0.053									0.293	0.083	0.021	0.739	0.461	0.194	16.572	29.198				
Technology driven industries	-0.793	-0.028									-0.726	-0.315	-0.253	0.305	0.245	0.012	15.641	40.349				
Skill intensity																						
Low skill industries	0.381	-0.118																				
Medium/blue collar workers	-0.157	-0.067																				
Medium/white collar workers	-0.016	0.286																				
High skill industries	-0.787	0.028																				
Labour intensive and low skill industries	1.112	-0.139																				
Revealed quality elasticity																						
High RQE	-0.177	-0.134									-0.199	-0.183	-0.004	0.601	0.326	0.177	13.586	37.040				
Medium RQE	0.138	0.155									0.013	0.233	-0.085	0.532	0.382	-0.005	16.682	41.793				
Low RQE	0.025	-0.058									0.263	0.037	0.079	1.018	0.644	0.437	12.572	48.752				
											2009	Change 2005/2009	Change 2007/2009									
INNOTYPE																						
High	-0.668	0.042	4.221	-0.358	1.085	-8.938	-0.043	2	0	+	-0.561	-0.075	-0.181						0.130	-0.162	-0.003	0.034
Med-high	-0.131	-0.202	11.803	-1.372	0.804	-2.489	-0.488	2	0	+	-0.095	-0.083	-0.005						0.097	-0.179	-0.004	0.044
Med	-0.107	0.036	20.236	0.998	1.057	0.177	-0.316	1	0	0	0.365	0.140	0.076						0.091	0.012	0.003	0.046
Med-low	0.136	-0.028	10.418	0.902	1.033	2.345	-0.740	1	0	+	0.175	0.134	0.053						0.175	-0.004	-0.001	0.092
Low	0.220	-0.026	15.203	-1.077	0.814	-1.776	-0.281	5	0	-	0.655	-0.058	0.041						0.016	-0.011	0.000	0.001
EDUTYPE																						
High	-0.340	0.090	17.476	2.057	1.138	0.161	0.152	1	0	0	-0.740	0.016	0.037									
Med-high	-0.333	0.111	5.267	0.629	0.630	-6.224	-0.337	1	0	+	-0.401	-0.033	-0.167									
Med	-0.040	0.049	34.393	-0.704	0.913	-2.939	-0.176	2	0	0	-0.249	0.035	0.058									
Med-low	0.045	0.091	10.714	0.780	0.795	2.306	-0.297	4	0	0	0.122	0.148	0.115									
Low	0.256	-0.128	32.150	-2.762	0.788	0.330	-0.403	4	-1	0	0.595	-0.025	0.041									
Total	0.000	0.000	100.000	0.000	0.888	0.000	-0.285	5	0	0	0.000	0.000	0.000	2.151	1.353	0.609	14.073	42.131	0.543	-0.331	-0.006	0.227

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A21.2: Selected Sectors I - Portugal

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
205	Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials	3.171
267	Cutting, shaping and finishing of stone	1.981
174	Manufacture of made-up textile articles, except apparel	1.853
193	Manufacture of footwear	1.675
265	Manufacture of cement, lime and plaster	1.601
Top-3 sectors (NACE 2-digit)		
20	Wood and products of wood and cork	1.274
19	Leather, leather and footwear	1.244
16	Tobacco products	1.111

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
205	Manufacture of other products of wood; manufacture of articles of cork, straw/plaiting materials	2.123
193	Manufacture of footwear	1.820
176	Manufacture of knitted and crocheted fabrics	1.717
182	Manufacture of other wearing apparel and accessories	1.452
23	Manufacture of coke, refined petroleum products and nuclear fuel	1.406
Top-3 sectors (NACE 2-digit)		
19	Leather, leather and footwear	1.472
18	Wearing apparel, dressing and dyeing of fur	1.339
17	Textiles and textile products	1.046

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
265	Manufacture of cement, lime and plaster	3.289
264	Manufacture of bricks, tiles and construction products	3.041
283	Manufacture of steam generators, except central heating hot water boilers	2.428
160	Manufacture of tobacco products	2.253
266	Manufacture of articles of concrete, plaster, cement	1.849
321	Manufacture of electronic valves and tubes and other electronic components	-0.903
316	Manufacture of electrical equipment n.e.c.	-1.012
362	Manufacture of jewellery and related articles	-1.115
352	Manufacture of railway, tramway locomotives, rolling stock	-4.930
231	Coke oven products	-5.991
The 3 winning and 3 losing sectors (NACE 2-digit)		
16	Tobacco products	2.253
25	Rubber and plastics	0.697
30	Office, accounting and computing machinery	0.646
19	Leather, leather and footwear	-0.389
31	Electrical machinery and apparatus	-0.417
18	Wearing apparel, dressing and dyeing of fur	-0.420

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
23	Manufacture of coke, refined petroleum products and nuclear fuel	2.360
192	Manufacture of luggage, handbags and the like, saddlery	2.099
205	Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials	2.062
211	Manufacture of pulp, paper and paperboard	1.307
176	Manufacture of knitted and crocheted fabrics	1.160
352	Manufacture of railway, tramway locomotives, rolling stock	-0.760
362	Manufacture of jewellery and related articles	-1.125
313	Manufacture of insulated wire and cable	-1.214
265	Manufacture of cement, lime and plaster	-1.707
264	Manufacture of bricks, tiles and construction products	-1.716
The 3 winning and 3 losing sectors (NACE 2-digit)		
16	Tobacco products	1.313
62	Air transport	1.084
37	Recycling	0.492
55	Hotels and restaurants	-0.262
18	Wearing apparel, dressing and dyeing of fur	-0.380
26	Non-metallic mineral products	-0.538

Source: Eurostat (SBS, Comext).

Table A21.3: Selected Sectors II - Portugal

Revealed comparative advantage (RCA)

		RCA (export)			Export shares in price segments					
					Low				High	
		2010	Change 1999/2010	Change 2007/2010	2009 in %	Change 1999/2009	Change 2007/2009	2009 in %	Change 1999/2009	Change 2007/2009
Top-5 industries (NACE 3-digit)						in percentage points			in percentage points	
205	Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials	3.171	-0.059	0.046	20.953	-3.298	3.448	41.749	15.460	10.622
267	Cutting, shaping and finishing of stone	1.981	0.424	0.148	70.717	-4.968	-7.338	1.094	-1.430	0.396
174	Manufacture of made-up textile articles, except apparel	1.853	-0.632	-0.124	12.327	-9.423	-0.144	8.085	3.959	4.477
193	Manufacture of footwear	1.675	-0.350	-0.027	6.643	-3.049	-13.674	4.135	-35.004	-16.526
265	Manufacture of cement, lime and plaster	1.601	3.289	-0.030	89.159	9.716	3.373	0.081	-1.943	0.073

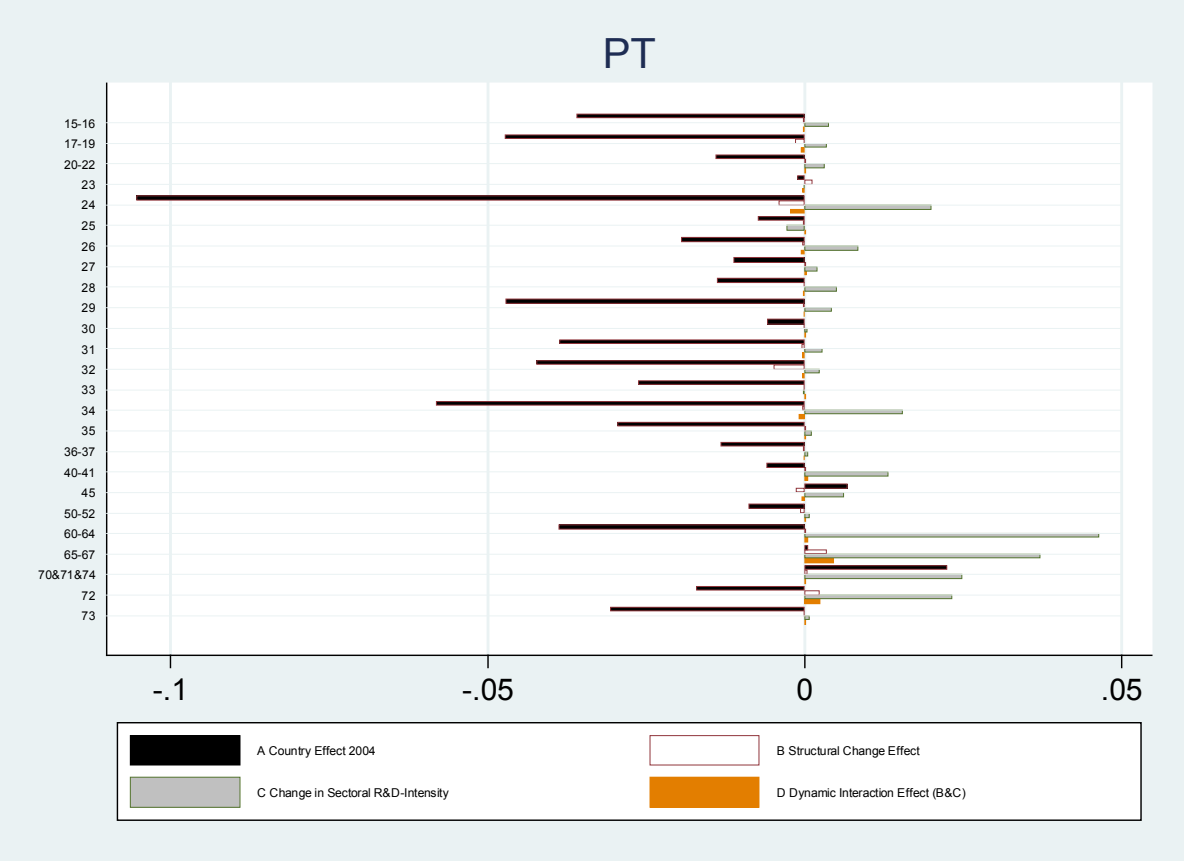
Relative value added (RVA)

		RVA		RCA (export)			Export shares in price segments					
							Low			High		
		2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Change 1999/2007	Change 2007/2009	2007	Change 1999/2007	Change 2007/2009
Top-5 industries (NACE 3-digit)								in percentage points			in percentage points	
205	Manufacture of other products of wood; manufacture of articles of cork, straw/plaiting materials	8.356	1.417	3.125	-0.104	0.046	17.505	-6.746	3.448	31.127	4.837	10.622
193	Manufacture of footwear	6.174	0.038	1.702	-0.323	-0.027	20.317	10.624	-13.674	20.661	-18.478	-16.526
176	Manufacture of knitted and crocheted fabrics	5.570	1.122	0.390	0.852	0.738	93.804	39.459	-7.454	2.477	-2.728	0.259
182	Manufacture of other wearing apparel and accessories	4.270	-0.367	1.225	-0.317	-0.106	8.039	-3.848	12.194	17.838	9.316	-2.612
23	Manufacture of coke, refined petroleum products and nuclear fuel	4.082	2.512	0.014	0.191	0.311	-	-	-	-	-	-

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext).

Graph A21.3: Sectoral R&D decomposition: Change in structure, R&D intensity and interaction between structure and intensity, NACE-2-digit level



1.22. Romania

Trade and industry specialisation

At the detailed manufacturing industry level, Romania is highly specialised in labour-intensive industries (preparation and spinning of textile fibres, sawmilling, wearing apparel and accessories), as well as in capital-intensive industries (cement), and marketing-driven ones (value-added only; footwear). At the more aggregated sector level, Romania features specialisation in low innovation and education sectors (wearing apparel, leather), but also in medium-high innovation sectors (textiles, basic metals).

Export quality and sectoral R&D performance

In line with its group of lower income countries specialised in labour-intensive industries (group 4), Romania's R&D intensity is below average given its industrial structure and its position on the quality ladder is far below the EU average.

Structural change

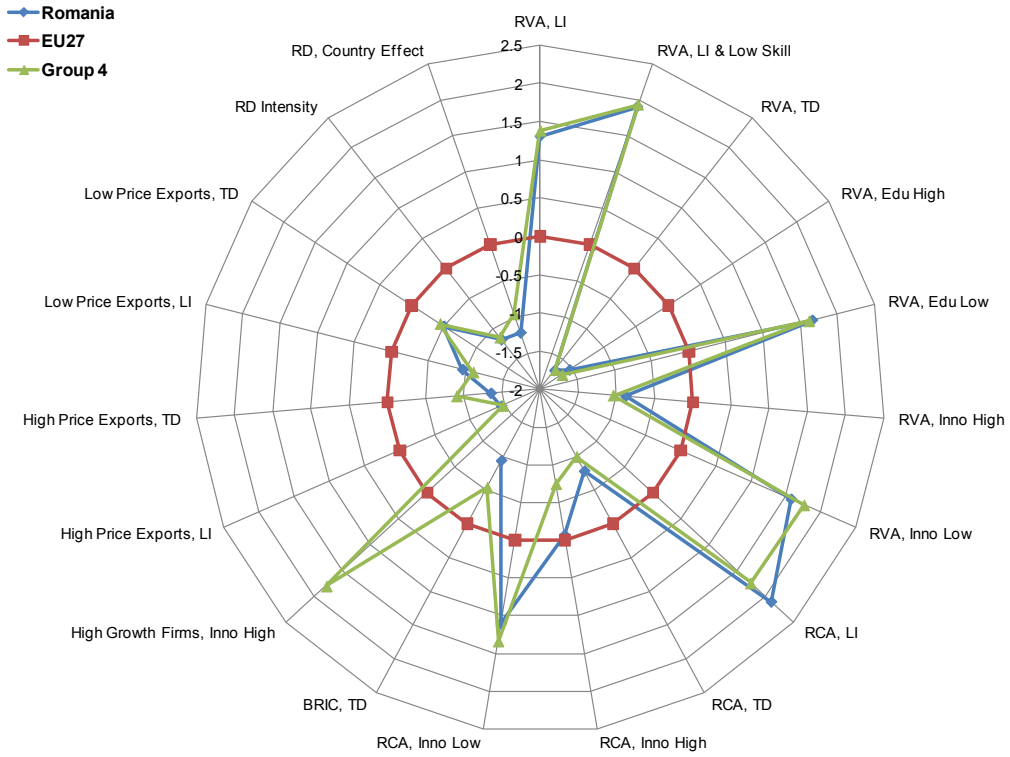
In terms of change, Romania is again very similar to group 4, showing strongly increasing relative shares of technology-driven industries (radio and TV transmitters and receivers) and of mainstream manufacturing (motorcycles and bicycles, isolated wire and cables), as well as of educationally intensive and highly innovation-intensive sectors (communication equipment, software). It shows decreasing specialisation in labour-intensive industries (leather clothes, dressing and dyeing of fur, cutting and finishing of stone), and in low innovation and education sectors (wearing apparel). Romania is climbing the quality ladder in labour-intensive industries, but not in technology-driven industries. Its sectoral R&D intensity is declining relative to the EU, probably partly as a result of the pronounced change in specialisation patterns towards the parts of the value chain in knowledge-intensive industries which are not knowledge-creating.

Overall, Romania is clearly catching up with respect to competitiveness as evidenced by quickly changing structures, but needs to pay attention to sectoral upgrading in terms of quality and R&D.

Impact of the crisis

In Romania, the crisis seems to have accelerated structural change towards technology-driven industries at the expense of capital-intensive industries.

Graph A22.1: Level



Graph A22.2: Change

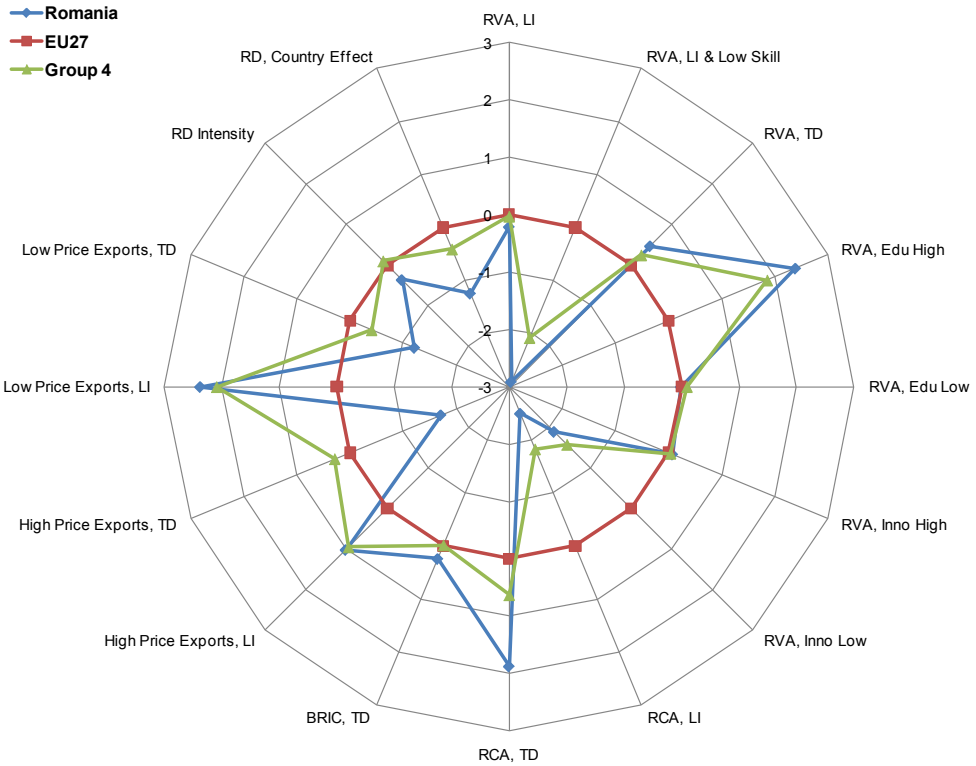


Table A22.1: Summary table - Romania

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2007	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
																Percentage points						
Factor inputs																						
Mainstream industries	-0.243	n.a.									-0.049	0.354	0.025	0.854	0.689	0.030	17.993	56.863				
Labourintensive industries	0.450	n.a.									0.921	-0.413	-0.170	0.297	-0.134	0.015	11.910	46.488				
Capital intensive industries	0.303	n.a.									0.068	-0.249	-0.230	1.216	0.785	-0.652	13.248	57.223				
Marketing driven industries	0.163	n.a.									-0.284	-0.258	-0.020	0.071	-0.070	-0.010	32.227	46.646				
Technology driven industries	-1.128	n.a.									-0.403	1.700	0.861	1.292	1.098	0.972	17.347	62.382				
Skill intensity																						
Low skill industries	0.530	n.a.																				
Medium/blue collar workers	-0.024	n.a.																				
Medium/white collar workers	-0.438	n.a.																				
High skill industries	-0.870	n.a.																				
Labour intensive and low skill industries	0.977	n.a.																				
Revealed quality elasticity																						
High RQE	-0.066	n.a.									-0.129	0.030	0.167	2.281	1.811	0.767	19.747	51.241				
Medium RQE	-0.035	n.a.									0.095	0.140	-0.098	0.451	0.266	0.047	17.639	46.168				
Low RQE	0.129	n.a.									0.105	-0.186	-0.103	0.998	0.291	-0.458	10.474	68.469				
											2009	Change 2004/2009	Change 2007/2009									
INNOTYPE																						
High	-0.422	0.016	n.a.	n.a.	n.a.	n.a.	n.a.	0	0	0	-0.025	0.465	0.247						0.093	-0.357	0.012	0.016
Med-high	0.197	-0.148	n.a.	n.a.	n.a.	n.a.	n.a.	0	0	0	-0.028	0.071	-0.036						0.069	-0.462	0.005	-0.026
Med	-0.443	0.378	n.a.	n.a.	n.a.	n.a.	n.a.	0	0	0	-0.068	0.017	-0.091						0.005	-0.065	0.000	-0.001
Med-low	0.302	-0.339	n.a.	n.a.	n.a.	n.a.	n.a.	0	0	0	-0.932	0.621	0.365						0.025	-0.244	-0.002	0.010
Low	0.278	-0.237	n.a.	n.a.	n.a.	n.a.	n.a.	0	0	0	0.761	-0.692	-0.190						0.009	-0.023	0.001	-0.009
EDUTYPE																						
High	-0.584	0.894	n.a.	n.a.	n.a.	n.a.	n.a.	0	0	0	-0.387	0.870	0.002									
Med-high	-0.425	-0.301	n.a.	n.a.	n.a.	n.a.	n.a.	0	0	0	-0.296	0.115	0.125									
Med	0.009	-0.009	n.a.	n.a.	n.a.	n.a.	n.a.	0	0	0	0.156	0.571	0.194									
Med-low	0.058	-0.157	n.a.	n.a.	n.a.	n.a.	n.a.	0	0	0	0.318	-0.025	0.099									
Low	0.290	-0.001	n.a.	n.a.	n.a.	n.a.	n.a.	0	0	0	0.159	-0.488	-0.221									
Total	0.000	0.000	n.a.	n.a.	n.a.	n.a.	n.a.	0	0	0	0.000	0.000	0.000	3.731	2.368	0.356	16.536	54.298	0.235	-1.150	0.004	0.008

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A22.2: Selected Sectors I - Romania

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
316	Manufacture of electrical equipment n.e.c.	1.675
201	Sawmilling and planing of wood, impregnation of wood	1.591
171	Preparation and spinning of textile fibres	1.585
193	Manufacture of footwear	1.483
351	Building and repairing of ships and boats	1.354
Top-3 sectors (NACE 2-digit)		
20	Wood and products of wood and cork	1.278
16	Tobacco products	1.247
18	Wearing apparel, dressing and dyeing of fur	1.157

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
193	Manufacture of footwear	1.839
182	Manufacture of other wearing apparel and accessories	1.708
265	Manufacture of cement, lime and plaster	1.683
177	Manufacture of knitted and crocheted articles	1.638
181	Manufacture of leather clothes	1.631
Top-3 sectors (NACE 2-digit)		
18	Wearing apparel, dressing and dyeing of fur	1.716
19	Leather, leather and footwear	1.456
41	Water supply	0.640

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
160	Manufacture of tobacco products	6.811
354	Manufacture of motorcycles and bicycles	4.045
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	3.176
323	Manuf. of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	2.669
222	Printing and service activities related to printing	2.603
261	Manufacture of glass and glass products	-1.192
183	Dressing and dyeing of fur; manufacture of articles of fur	-1.342
267	Cutting, shaping and finishing of stone	-1.659
231	Coke oven products	-3.668
265	Manufacture of cement, lime and plaster	-3.909
The 3 winning and 3 losing sectors (NACE 2-digit)		
16	Tobacco	6.811
32	Radio, television and communication equipment	2.946
34	Motor vehicles, trailers and semi-trailers	1.870
23	Coke, refined petroleum and nuclear fuel	-0.741
26	Non-metallic mineral products	-1.096
18	Wearing apparel, dressing and dyeing of fur	-1.128

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
265	Manufacture of cement, lime and plaster	3.434
316	Manufacture of electrical equipment n.e.c.	1.797
313	Manufacture of insulated wire and cable	1.724
151	Production, processing, preserving of meat, meat products	1.637
343	Manufacture of parts, accessories for motor vehicles	1.318
181	Manufacture of leather clothes	-1.969
296	Manufacture of weapons and ammunition	-2.099
154	Manufacture of vegetable and animal oils and fats	-2.362
183	Dressing and dyeing of fur; manufacture of articles of fur	-2.902
16	Manufacture of tobacco products	-7.648
The 3 winning and 3 losing sectors (NACE 2-digit)		
50	Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of fuel	0.819
72	Computer and related activities	0.452
70	Real estate activities	0.434
18	Wearing Apparel, Dressing And Dying Of Fur	-1.189
41	Water supply	-1.835
16	Tobacco products	-5.314

Source: Eurostat (SBS, Comext).

Table A22.3: Selected Sectors II - Romania

Revealed comparative advantage (RCA)

	RCA (export)			Export shares in price segments					
					Low			High	
	2010	Change 1999/2010	Change 2007/2010	2009 in %	Change 1999/2009	Change 2007/2009	2009 in %	Change 1999/2009	Change 2007/2009
Top-5 industries (NACE 3-digit)					in percentage points			in percentage points	
316 Manufacture of electrical equipment n.e.c.	1.675	1.081	-0.102	72.453	68.826	9.376	3.528	-6.243	1.890
201 Sawmilling and planing of wood, impregnation of wood	1.591	-0.611	0.160	72.676	-14.330	1.159	1.579	1.044	-0.710
171 Preparation and spinning of textile fibres	1.585	1.438	0.151	58.263	-29.616	11.538	5.247	3.469	-0.282
193 Manufacture of footwear	1.483	-0.739	-0.414	63.465	10.369	-4.297	22.083	-14.609	0.954
351 Building and repairing of ships and boats	1.354	-0.282	-0.005	10.320	-24.810	8.946	38.676	36.616	-11.989

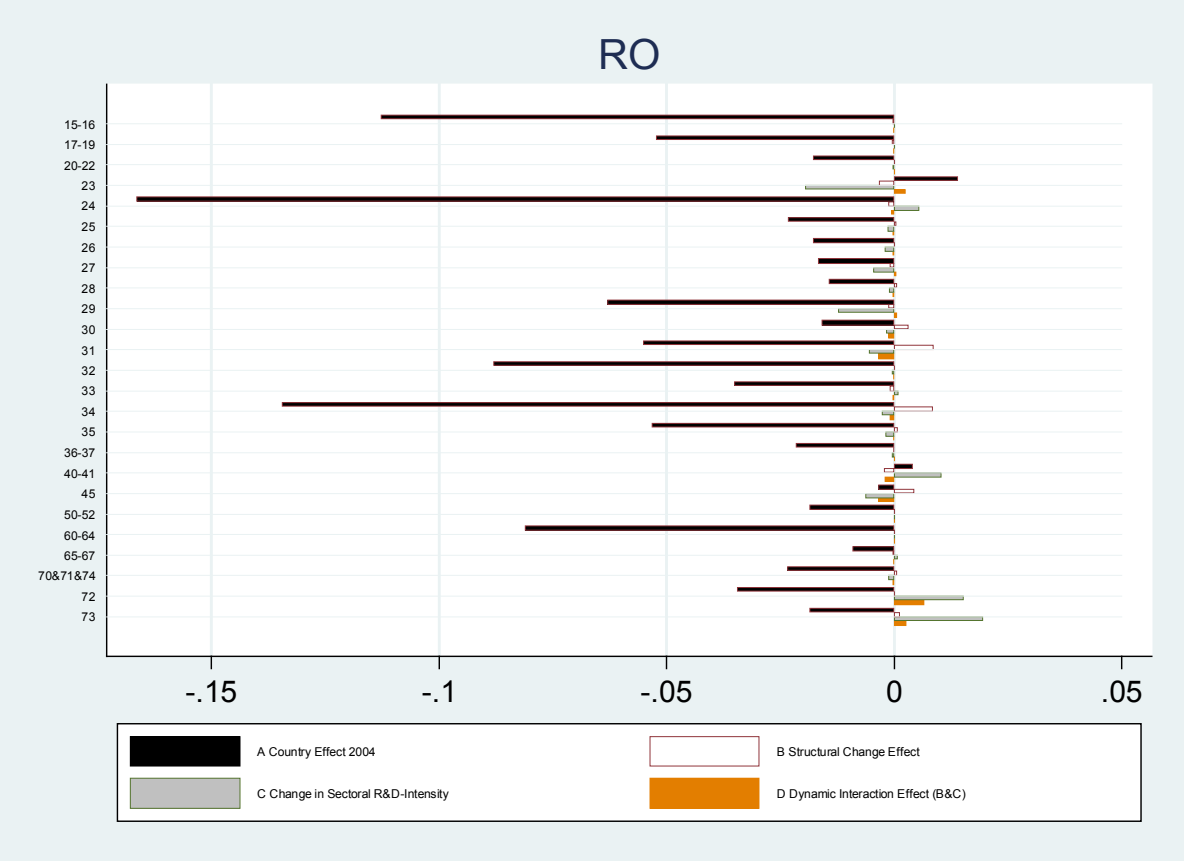
Relative value added (RVA)

	RVA		RCA (export)			Export shares in price segments				
							Low		High	
	2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Change 1999/2007	Change 2007/2009	2007	Change 1999/2007	Change 2007/2009
Top-5 industries (NACE 3-digit)							in percentage points			in percentage points	
193 Manufacture of footwear	6.292	1.005	1.896	-0.325	-0.414	67.762	14.666	-4.297	21.129	-15.563	0.954
182 Manufacture of other wearing apparel and accessories	5.515	-1.004	1.700	-0.614	-0.519	56.798	-27.208	-24.501	5.695	5.139	4.131
265 Manufacture of cement, lime and plaster	5.383	2.766	-0.432	-2.450	-1.459	93.949	-5.544	-14.494	0.000	0.000	4.814
177 Manufacture of knitted and crocheted articles	5.146	0.070	1.354	-0.454	-0.458	32.780	-40.382	-15.803	16.361	15.714	1.703
181 Manufacture of leather clothes	5.107	-1.293	0.771	-0.153	-0.380	0.159	-99.841	0.805	7.524	7.524	-3.542

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext).

Graph A22.3: Sectoral R&D decomposition: Change in structure, R&D intensity and interaction between structure and intensity, NACE-2-digit level



1.23. Slovenia

At the detailed manufacturing industry level, Slovenia features specialisation in labour-intensive industries (sawmilling and planing of wood, made-up textile articles) and mainstream manufacturing (domestic appliances, other non metallic mineral products). At the more aggregated sector level, Slovenia is specialised in terms of value added in highly innovation-intensive sectors (machinery, electrical machinery, R&D), but also in the low to medium range of education and innovation sectors (e.g. wood and cork).

Export quality and sectoral R&D performance

Slovenia's R&D intensity is below average given its industrial structure, as is its position on the quality ladder. However, in comparison with its group of lower income countries featuring trade specialisation in knowledge intensive industries, Slovenia manages a higher R&D intensity and better quality performance in labour-intensive industries.

Structural change

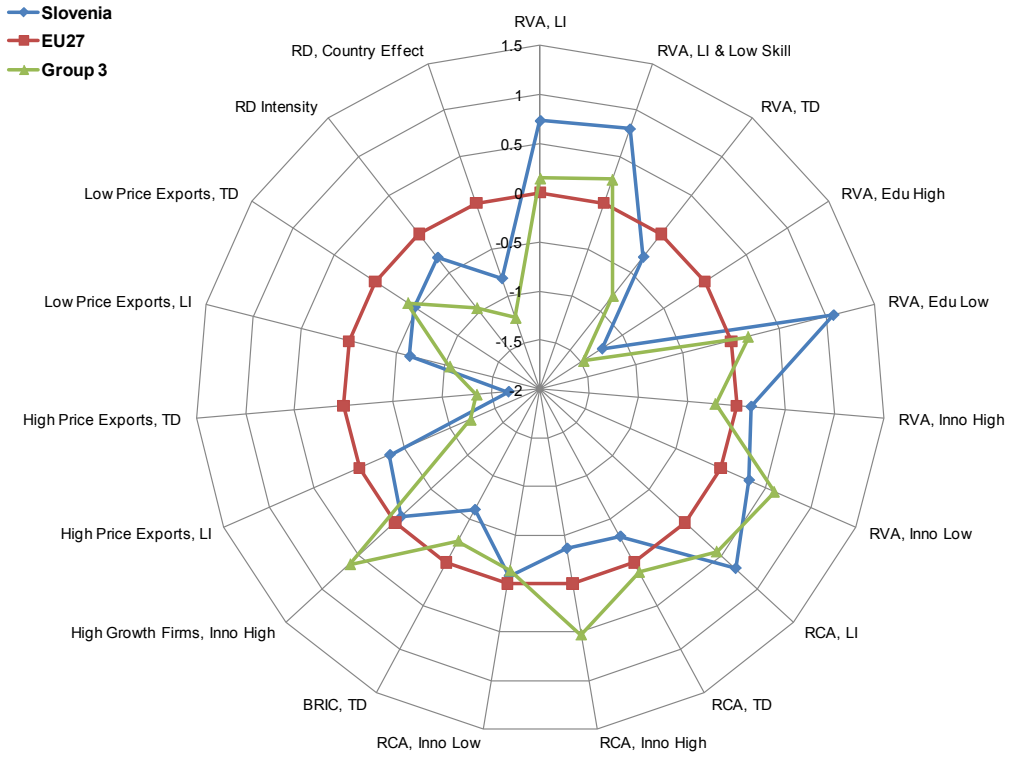
In terms of change, Slovenia shows increasing relative shares in technology-driven industries (computers, industrial process control equipment), as well as increasing relative value added in mainstream manufacturing (domestic appliances, batteries) and capital-intensive industries (e.g., man-made fibres). It shows declining specialisation in labour-intensive industries (builders' carpentry and joinery, other wearing apparel and accessories) as well as in low innovation and low education sectors (leather, auxiliary transport activities). Slovenia has gained export shares in the high quality segments, but also in the low quality segment in technology-driven industries; its R&D intensity decreased relative to the EU, taking account of its industrial structure.

Overall, Slovenia is catching up with respect to competitiveness, but needs to pay attention to sectoral upgrading.

Impact of the crisis

The crisis slowed down structural change towards technology-driven industries, favouring instead capital-intensive ones.

Graph A23.1 Level



Graph A23.2: Change

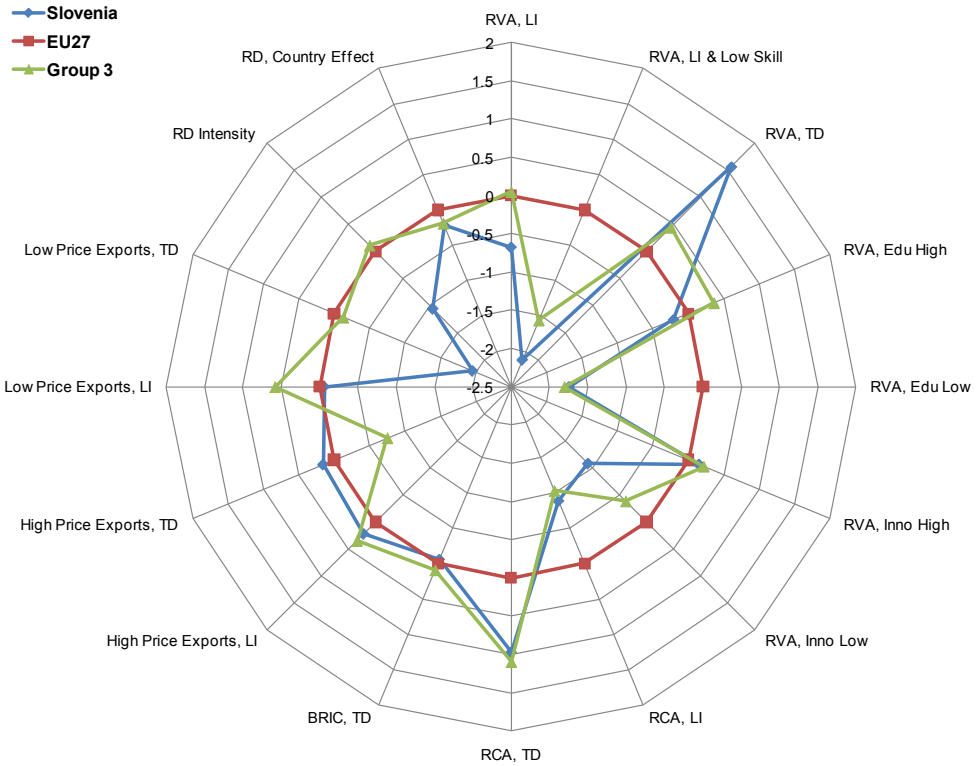


Table A23.1: Summary table - Slovenia

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2007	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
																Percentage points						
Factor inputs																						
Mainstream industries	0.160	0.043									0.243	-0.060	-0.004	1.568	0.991	-0.585	13.289	59.484				
Labourintensive industries	0.276	-0.055									0.405	-0.265	-0.036	0.629	0.492	0.050	30.627	37.223				
Capital intensive industries	-0.389	0.114									-0.151	-0.086	0.049	0.448	0.296	0.185	11.487	50.845				
Marketing driven industries	-0.181	-0.205									-0.281	0.008	-0.017	0.338	0.193	-0.033	15.581	37.886				
Technology driven industries	-0.126	0.184									-0.133	0.392	0.037	1.675	0.816	-0.068	10.463	55.549				
Skill intensity																						
Low skill industries	0.013	-0.177																				
Medium/blue collar workers	0.074	0.067																				
Medium/white collar workers	-0.061	-0.008																				
High skill industries	-0.040	0.304																				
Labour intensive and low skill industries	0.528	-0.231																				
Revealed quality elasticity																						
High RQE	-0.141	0.019									-0.172	0.037	-0.075	2.267	1.026	-0.249	11.106	56.261				
Medium RQE	0.009	0.050									-0.036	-0.017	0.048	1.277	0.996	-0.142	22.202	38.844				
Low RQE	0.161	-0.084									0.271	-0.059	0.057	1.113	0.764	-0.059	13.942	54.933				
											2009	Change 2004/2009	Change 2007/2009									
INNOTYPE																						
High	0.056	0.020	9.335	0.289	-0.126	1.705	-0.051	4	1	0	-0.141	-0.054	0.006						0.379	-0.340	-0.024	-0.008
Med-high	0.195	0.117	15.546	1.083	-0.219	-2.033	0.172	3	0	0	0.135	0.120	0.020						0.475	-0.324	-0.030	-0.009
Med	-0.078	-0.104	22.411	1.648	-0.193	-1.437	0.030	3	0	0	0.058	-0.162	-0.011						0.053	-0.056	0.001	0.021
Med-low	-0.040	-0.085	8.798	-1.638	0.413	1.356	-0.013	3	0	0	-0.446	0.346	0.143						0.069	-0.090	-0.006	0.025
Low	0.061	-0.174	14.933	-0.143	-0.112	-1.629	0.061	3	0	0	-0.079	-0.297	-0.124						0.010	-0.016	-0.003	-0.008
EDUTYPE																						
High	-0.444	-0.044	17.634	3.234	-0.110	1.228	0.144	3	0	0	-1.143	0.255	0.273									
Med-high	0.095	0.051	8.055	-0.003	-0.101	0.315	0.111	3	0	0	-0.365	0.117	0.125									
Med	-0.053	0.199	34.915	0.547	-0.030	-1.325	0.042	5	1	0	0.376	0.147	0.057									
Med-low	0.112	-0.086	13.648	-0.024	-0.267	-2.802	0.030	2	0	-	0.339	-0.302	-0.114									
Low	0.195	-0.141	25.748	-3.755	-0.077	1.058	0.125	3	0	0	0.128	-0.059	-0.040									
Total	0.000	0.000	100.000	0.000	-0.111	0.000	0.106	4	0	0	0.000	0.000	0.000	4.657	2.787	-0.451	14.830	51.434	0.987	-0.847	-0.062	0.016

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A23.2: Selected Sectors I - Slovenia

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
247	Manufacture of man-made fibres	1.752
297	Manufacture of domestic appliances n.e.c.	1.751
201	Sawmilling and planing of wood, impregnation of wood	1.333
361	Manufacture of furniture	1.254
268	Manufacture of other non-metallic mineral products	1.204
Top-3 sectors (NACE 2-digit)		
20	Wood and products of wood and cork	1.005
36	Furniture, jewellery, musical instruments, sports goods, games and toys	0.645
28	Fabricated metal	0.380

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
297	Manufacture of domestic appliances n.e.c.	1.814
174	Manufacture of made-up textile articles, except apparel	1.702
314	Manufacture of accumulators, primary cells and primary batteries	1.382
268	Manufacture of other non-metallic mineral products	1.336
181	Manufacture of leather clothes	1.300
Top-3 sectors (NACE 2-digit)		
17	Textiles and textile products	0.834
19	Leather, leather and footwear	0.768
20	Wood and products of wood and cork	0.659

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
231	Coke oven products	4.474
154	Manufacture of vegetable and animal oils and fats	2.914
283	Manufacture of steam generators, except central heating hot water boilers	1.937
233	Nuclear fuel	1.785
300	Manufacture of office machinery and computers	1.718
203	Manufacture of builders' carpentry and joinery	-1.318
362	Manufacture of jewellery and related articles	-1.384
182	Manufacture of other wearing apparel and accessories	-1.435
181	Manufacture of leather clothes	-2.466
160	Manufacture of tobacco products	-5.999
The 3 winning and 3 losing sectors (NACE 2-digit)		
30	Office, accounting and computing machinery	1.718
23	Coke, refined petroleum and nuclear fuel	1.007
32	Radio, television and communication equipment	0.746
33	Medical, precision and optical instruments	-0.445
18	Wearing apparel, dressing and dyeing of fur	-1.446
16	Tobacco products	-5.999

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
297	Manufacture of domestic appliances n.e.c.	1.652
365	Manufacture of games and toys	1.384
314	Manufacture of accumulators, primary cells and primary batteries	1.303
205	Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials	1.211
316	Manufacture of electrical equipment n.e.c.	1.063
172	Textile weaving	-1.075
153	Processing and preserving of fruit and vegetables	-1.120
192	Manufacture of luggage, handbags and the like, saddlery	-1.260
182	Manufacture of other wearing apparel and accessories	-1.352
364	Manufacture of sports goods	-1.537
The 3 winning and 3 losing sectors (NACE 2-digit)		
37	Recycling	1.845
40	Electricity and gas	0.467
64	Post and telecommunications	0.329
63	Supporting and auxiliary transport activities; activities of travel agencies	-0.519
19	Leather, leather and footwear	-1.617
18	Wearing apparel, dressing and dyeing of fur	-1.880

Source: Eurostat (SBS, Comext).

Table A23.3: Selected Sectors II - Slovenia

Revealed comparative advantage (RCA)

		RCA (export)			Export shares in price segments					
		2010	Change 1999/2010	Change 2007/2010	2009 in %	Low Change 1999/2009	Change 2007/2009	2009 in %	High Change 1999/2009	Change 2007/2009
Top-5 industries (NACE 3-digit)						in percentage points			in percentage points	
247	Manufacture of man-made fibres	1.752	0.354	0.413	3.127	-12.227	0.154	3.497	-3.207	-1.178
297	Manufacture of domestic appliances n.e.c.	1.751	-0.034	0.078	51.929	-22.049	-5.935	27.236	26.334	18.075
201	Sawmilling and planing of wood, impregnation of wood	1.333	0.793	0.252	88.203	7.612	-4.954	3.095	-11.664	-0.784
361	Manufacture of furniture	1.254	-0.335	-0.085	22.576	-11.035	-0.825	54.009	4.066	1.331
268	Manufacture of other non-metallic mineral products	1.204	-0.325	0.029	79.490	-6.190	-5.804	2.286	0.457	1.668

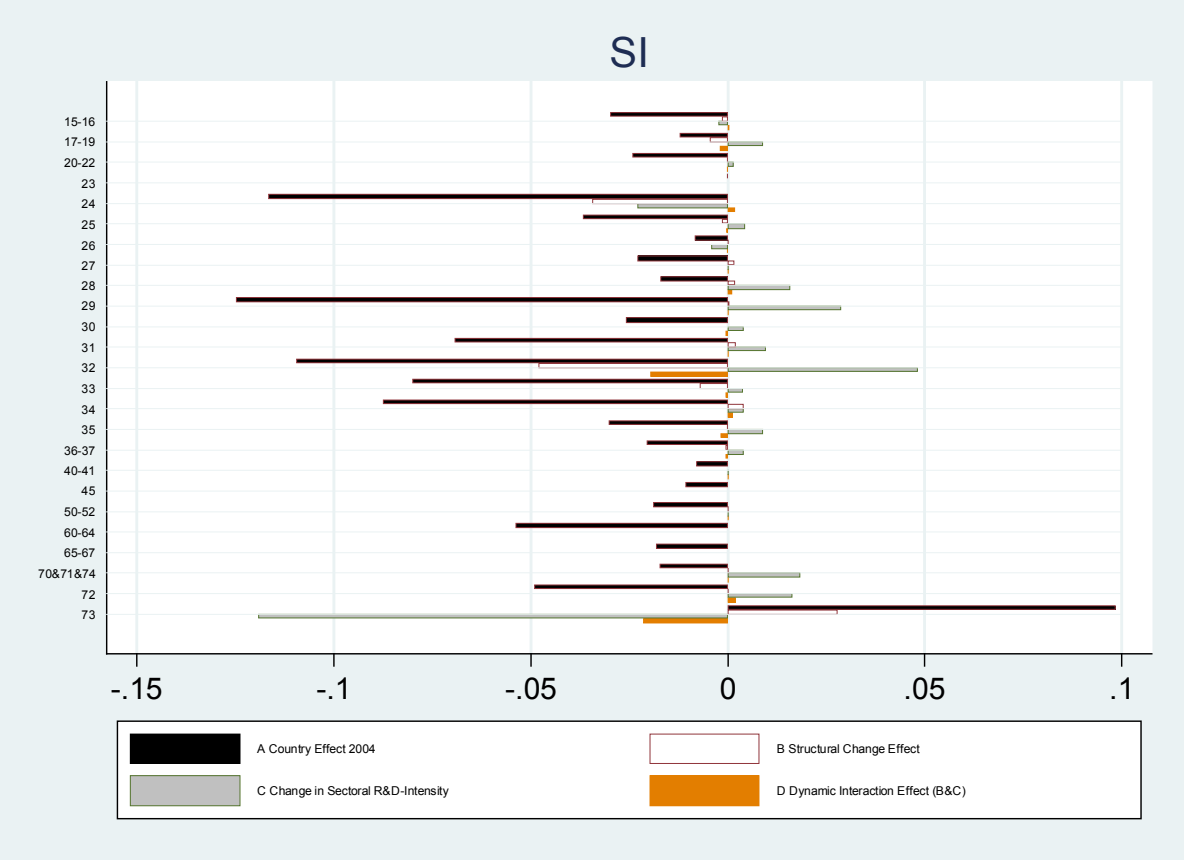
Relative value added (RVA)

		RVA		RCA (export)			Export shares in price segments				
		2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Low Change 1999/2007	Change 2007/2009	2007	High Change 1999/2007	Change 2007/2009
Top-5 industries (NACE 3-digit)								in percentage points			in percentage points	
297	Manufacture of domestic appliances n.e.c.	6.132	1.290	1.674	-0.112	0.078	57.864	-16.114	-5.935	9.161	8.259	18.075
174	Manufacture of made-up textile articles, except apparel	5.483	0.232	0.567	-0.104	0.091	5.964	-18.066	4.404	60.089	48.084	-5.468
314	Manufacture of accumulators, primary cells and primary batteries	3.983	0.953	0.947	0.344	0.153	94.962	-3.040	1.342	0.367	0.275	0.335
268	Manufacture of other non-metallic mineral products	3.805	-0.023	1.175	-0.354	0.029	85.294	-0.386	-5.804	0.618	-1.211	1.668
181	Manufacture of leather clothes	3.671	1.224	-0.602	-1.847	-0.619	0.000	-6.038	24.781	63.041	63.041	-44.450

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext).

Graph A23.3: Sectoral R&D decomposition: Change in structure, R&D intensity and interaction between structure and intensity, NACE-2-digit level



1.24. Slovakia

Trade and industry specialisation

At the detailed manufacturing industry level, Slovakia features industry specialisation in mainstream manufacturing (lighting equipment and electric lamps, and capital-intensive industries (basic iron and steel), as well as trade specialisation in technology-driven (radio and TV receivers) and labour-intensive industries (manufacture of steam generators). At the more aggregated sector level, Slovakia shows specialisation in high and medium-high innovation sectors (communication equipment and motor vehicles), as well as in medium to medium-low education sectors (fabricated and basic metals). Slovakia features a high share of exports to the BRIC countries by technology-driven industries.

Export quality and sectoral R&D performance

Slovakia's R&D intensity is far below average, taking account of its industrial structure, indicating a position in the production-oriented part of knowledge-intensive industries. Slovakia features high shares of exports in the low price segment and low shares in the high price segment, indicating an unfavourable position on the quality ladder. This is similar to its group of lower income countries specialised in knowledge-intensive industries.

Structural change

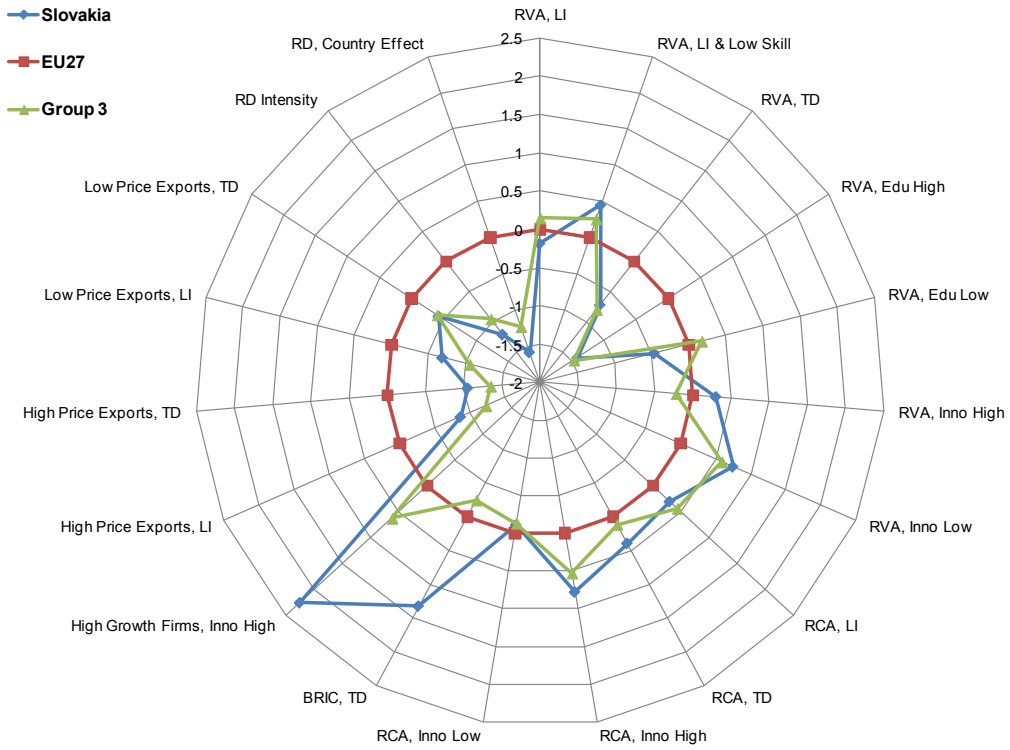
In terms of change, Slovakia increased its relative shares in technology-driven industries (radio and TV receivers and transmitters), as well as its value added specialisation in mainstream manufacturing (lighting equipment and electric lamps); furthermore, Slovenia increased its relative industry share in high innovation sectors (computers, communication equipment, medical, optical and precision instruments) and decreased specialisation in labour-intensive low-skill industries (dressing and dyeing of fur) and low education sectors (wearing apparel). Slovakia has climbed the quality ladder in contrast with its group, but shows considerably decreasing R&D intensity, taking account of its industrial structure.

Overall, Slovakia is catching up with respect to competitiveness, while it needs to pay attention to the "R&D" component of sectoral upgrading.

Impact of the crisis

Overall, the impact of the crisis on Slovakia's economic structure was limited, slowing down the decline of capital-intensive industries and structural change towards technology-driven industries.

Graph A24.1: Level



Graph A24.2: Change

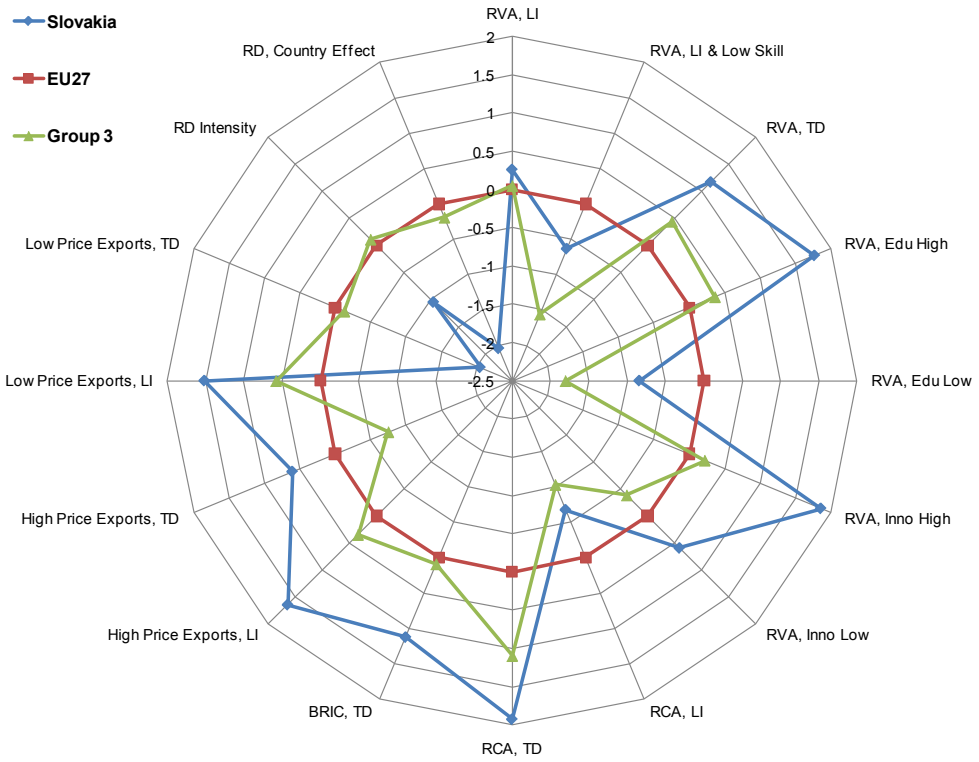


Table A24.1: Summary table - Slovakia

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2007	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
Factor inputs																						
Mainstream industries	0.178	0.137									-0.073	-0.100	0.044	0.950	0.562	0.176	18.185	49.255				
Labourintensive industries	-0.086	0.032									0.196	-0.251	-0.072	0.982	0.708	0.727	21.591	38.505				
Capital intensive industries	0.533	-0.087									-0.075	-0.590	-0.042	0.524	0.249	0.191	8.375	45.868				
Marketing driven industries	-0.442	-0.365									-0.421	0.081	0.012	0.173	-0.023	-0.011	31.529	38.442				
Technology driven industries	-0.341	0.169									0.154	0.658	0.029	3.883	3.694	2.151	23.771	42.327				
Skill intensity																						
Low skill industries	0.287	-0.008																				
Medium/blue collar workers	-0.178	0.056																				
Medium/white collar workers	0.060	0.007																				
High skill industries	-0.544	-0.012																				
Labour intensive and low skill industries	0.329	-0.091																				
Revealed quality elasticity																						
High RQE	-0.379	-0.288									-0.252	-0.041	-0.052	4.881	4.351	2.895	14.454	40.649				
Medium RQE	-0.074	0.093									-0.151	-0.042	-0.003	0.618	0.375	0.176	19.066	38.300				
Low RQE	0.437	0.135									0.425	0.027	0.057	1.014	0.463	0.163	25.438	48.727				
											2009	Change 2004/2009	Change 2007/2009									
INNOTYPE																						
High	0.113	0.261	8.025	2.145	0.215	-8.085	0.875	5	0	+	0.253	0.340	0.166						0.115	-0.581	-0.030	-0.025
Med-high	0.379	-0.071	15.372	-1.960	0.796	7.562	0.886	2	1	+	0.033	-0.104	-0.097						0.063	-0.559	-0.002	-0.009
Med	-0.410	0.306	16.537	4.200	0.461	0.141	0.846	2	0	+	-0.282	-0.076	0.004						0.009	-0.088	0.001	0.004
Med-low	0.591	-0.473	13.106	0.097	0.394	0.770	0.323	1	-1	-	-0.762	-0.250	-0.037						0.020	-0.138	-0.002	-0.011
Low	0.142	0.101	16.691	-6.102	0.565	1.231	0.991	5	0	-	-0.118	-0.369	-0.006						0.000	-0.032	0.000	-0.005
EDUTYPE																						
High	-0.522	0.531	11.118	2.226	0.045	-4.071	0.727	3	0	-	-1.300	-0.395	-0.034									
Med-high	-0.344	-0.255	7.175	1.010	0.382	-3.667	0.734	3	1	0	-0.010	0.416	0.110									
Med	0.275	-0.043	37.748	-3.597	0.576	-0.347	1.073	5	0	-	0.333	0.034	-0.011									
Med-low	0.001	0.328	15.660	-2.148	0.246	-3.664	0.830	2	1	-	0.054	-0.249	0.032									
Low	-0.098	-0.093	28.299	2.509	0.415	4.838	0.736	1	-3	+	0.001	-0.178	-0.024									
Total	0.000	0.000	100.000	0.000	0.358	0.000	0.838	4	0	0	0.000	0.000	0.000	6.512	5.189	3.234	20.128	43.538	0.211	-1.419	-0.032	-0.050

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A24.2: Selected Sectors I - Slovakia

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
323	Manuf. of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	2.301
342	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers	1.910
282	Manufacture of tanks, reservoirs and containers of metal; manufacture of central heating radiators and boilers	1.372
265	Manufacture of cement, lime and plaster	1.126
283	Manufacture of steam generators, except central heating hot water boilers	0.807
Top-3 sectors (NACE 2-digit)		
32	Radio, television and communication equipment	1.309
34	Motor vehicles, trailers and semi-trailers	0.567
28	Fabricated metal	0.367

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
323	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus	2.413
315	Manufacture of lighting equipment and electric lamps	2.409
192	Manufacture of luggage, handbags and the like, saddlery	1.710
313	Manufacture of insulated wire and cable	1.446
271	Manufacture of basic iron and steel and of ferro-alloys (ECSC)	1.427
Top-3 sectors (NACE 2-digit)		
19	Leather, leather and footwear	1.323
27	Basic metals	1.317
40	Electricity and gas	1.224

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
267	Cutting, shaping and finishing of stone	2.766
323	Manuf. of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	2.514
176	Manufacture of knitted and crocheted fabrics	2.343
181	Manufacture of leather clothes	2.301
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	1.918
247	Manufacture of man-made fibres	-1.663
263	Manufacture of ceramic tiles and flags	-1.710
157	Manufacture of prepared animal feeds	-2.545
183	Dressing and dyeing of fur; manufacture of articles of fur	-3.266
160	Manufacture of tobacco products	-8.812
The 3 winning and 3 losing sectors (NACE 2-digit)		
32	Radio, television and communication equipment	2.372
30	Office, accounting and computing machinery	0.594
33	Medical, precision and optical instruments	0.245
18	Wearing apparel, dressing and dyeing of fur	-0.944
23	Coke, refined petroleum and nuclear fuel	-1.036
16	Tobacco products	-8.812

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
315	Manufacture of lighting equipment and electric lamps	12.010
323	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	11.152
192	Manufacture of luggage, handbags and the like, saddlery	4.569
271	Manufacture of basic iron and steel and of ferro-alloys (ECSC)	4.443
275	Casting of metals	1.708
154	Manufacture of vegetable and animal oils and fats	-4.081
247	Manufacture of man-made fibres	-4.948
273	Other first processing of iron and steel and production of non-ECSC ferro-alloys	-6.040
16	Manufacture of tobacco products	-6.066
355	Manufacture of other transport equipment n.e.c.	-17.822
The 3 winning and 3 losing sectors (NACE 2-digit)		
32	Radio, television and communication equipment	2.142
19	Leather, leather and footwear	1.385
27	Basic metals	1.364
40	Electricity and gas	-2.564
23	Coke, refined petroleum and nuclear fuel	-3.824
16	Tobacco products	-4.113

Source: Eurostat (SBS, Comext).

Table A24.3: Selected Sectors II - Slovakia

Revealed comparative advantage (RCA)

		RCA (export)			Export shares in price segments				
		2010	Change 1999/2010	Change 2007/2010	2009 in %	Low Change 1999/2009	Change 2007/2009	2009 in %	High Change 1999/2009	Change 2007/2009
Top-5 industries (NACE 3-digit)						in percentage points			in percentage points	
323	Manuf. of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	2.301	2.514	0.231	40.567	0.495	35.977	36.329	31.078	30.770
342	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers	1.910	1.411	0.139	4.479	-71.805	-15.764	31.405	30.960	26.817
282	Manufacture of tanks, reservoirs and containers of metal; manufacture of central heating radiators and boilers	1.372	0.579	-0.225	10.404	-41.164	-24.650	46.356	15.556	-0.374
265	Manufacture of cement, lime and plaster	1.126	-1.127	-0.119	93.100	-6.082	-2.850	0.077	0.049	0.077
283	Manufacture of steam generators, except central heating hot water boilers	0.807	-0.405	-0.396	10.661	-44.895	-25.454	8.365	8.365	-5.946

Relative Value added (RVA)

		RVA		RCA (export)			Export shares in price segments				
		2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Low Change 1999/2007	Change 2007/2009	2007	High Change 1999/2007	Change 2007/2009
Top-5 industries (NACE 3-digit)								in percentage points			in percentage points	
323	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus	11.170	11.066	2.070	2.284	0.231	4.589	-35.483	35.977	5.559	0.308	30.770
315	Manufacture of lighting equipment and electric lamps	11.120	10.145	0.372	0.424	0.025	44.079	-7.252	4.689	35.613	32.791	-10.709
192	Manufacture of luggage, handbags and the like, saddlery	5.530	4.768	-1.068	-0.899	0.316	19.128	-15.015	17.549	61.734	44.040	-15.589
313	Manufacture of isulated wire and cable	4.247	-1.299	0.121	0.151	0.199	33.960	-28.119	-4.753	47.898	20.208	4.998
271	Manufacture of basic iron and steel and of ferro-alloys (ECSC)	4.165	4.032	0.595	-0.677	0.097	83.931	-12.885	-6.325	0.526	0.380	4.591

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext).

Graph A24.3: Sectoral R&D decomposition: Change in structure, R&D intensity and interaction between structure and intensity, NACE-2-digit level

1.25. Finland

Trade and industry specialisation

At the detailed manufacturing industry level, Finland features specialisation in capital-intensive industries (manufacture of pulp, paper and paperboard), in exports, in mainstream manufacturing (agricultural and forestry machinery, electric motors), in labour-intensive industries (sawmilling and planing of wood, steam generators, building and repairing of ships), in value added as well in technology-driven industries (apparatus for line telephony). At the more aggregated sector level, Finland is specialised in highly innovation-intensive sectors (communication equipment), and at an export level also in medium innovation sectors (pulp and paper, wood and cork). Finland is not specialised in high education sectors, due to low relative shares in R&D and in business services. Finland features a low share of high growth firms in highly innovative sectors, pointing to weak business dynamism.

Export quality and sectoral R&D performance

Finland's R&D intensity is well above the average, given its industrial structure, as are its position on the quality ladder for technology-driven industries. However, the quality indicators for labour-intensive industries are below the EU average (interestingly, just like the other Scandinavian countries). Overall, within the group of higher income countries specialised in knowledge-intensive industries, Finland is more similar to countries featuring specialisation in knowledge-intensive manufacturing such as Germany, Austria and Sweden, rather than in knowledge-intensive services.

Structural change

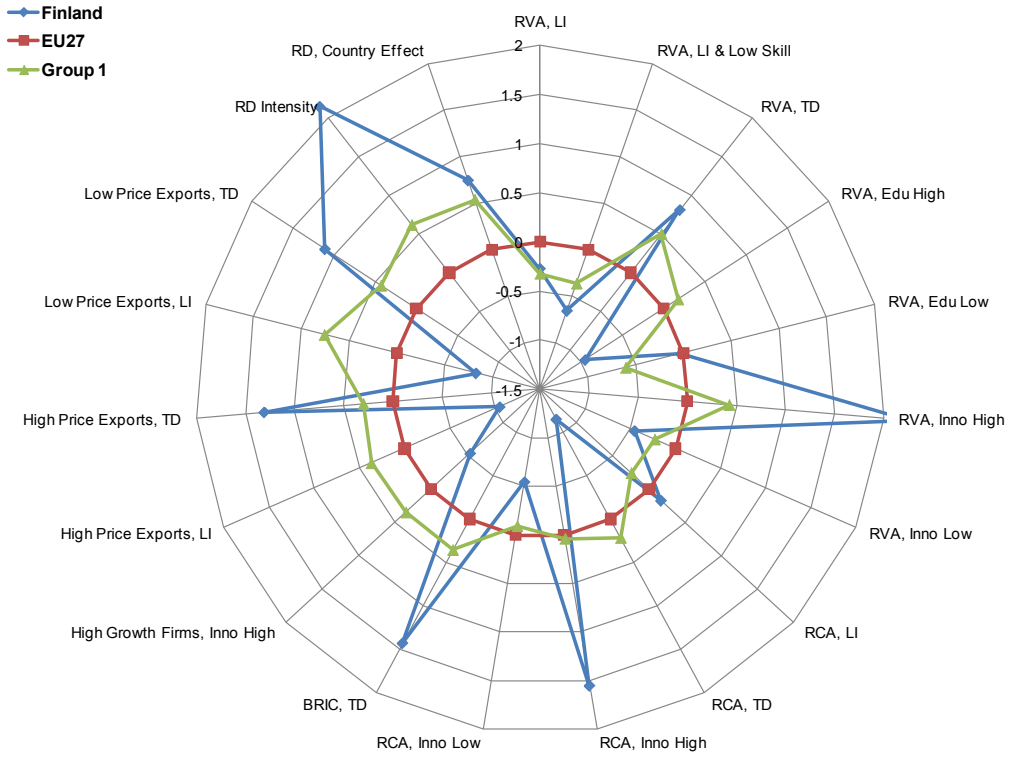
In terms of change, Finland has drastically reduced its trade specialisation in technology-driven industries (manufacture of TV and radio transmitters). This is in contrast with increasing industry specialisation and can be explained by the more recent trade data, which may reflect Nokia's problems with smart phones. Otherwise, Finland has increased its specialisation in mainstream manufacturing (other transport equipment, forestry machinery) as well as in high innovation and education sectors (machinery, R&D, business services). Finland's R&D intensity is declining, given its industrial structure, and its movement on the quality ladder is mixed, with some segments improving and others deteriorating.

Overall, while Finland still enjoys a favourable position with respect to competitiveness, both structural change and sectoral upgrading trends may harm competitiveness in the medium term.

Impact of the crisis

In Finland, technology-driven industries saw a considerable slump, which may however not be related to the crisis as explained above.

Graph A25.1: Level



Graph A25.2: Change

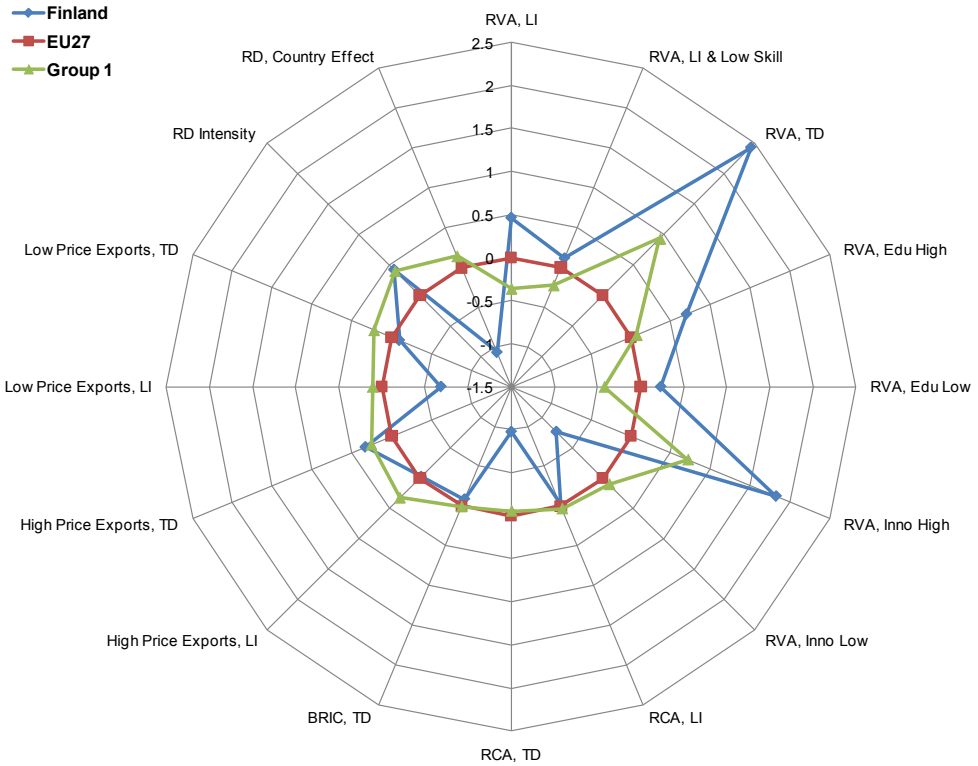


Table A25.1: Summary table - Finland

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2007	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
																Percentage points						
Factor inputs																						
Mainstream industries	-0.072	0.081									0.180	0.251	0.170	6.680	4.297	1.795	40.862	14.753				
Labourintensive industries	-0.127	0.060									0.114	-0.006	-0.032	0.897	0.381	-0.017	18.513	42.352				
Capital intensive industries	0.296	-0.336									0.620	-0.025	0.168	4.163	2.806	1.208	10.019	47.871				
Marketing driven industries	-0.453	-0.085									-1.150	0.039	0.110	1.054	0.284	0.199	33.293	33.483				
Technology driven industries	0.281	0.191									-0.670	-0.443	-0.450	4.003	1.347	-1.714	74.536	5.575				
Skill intensity																						
Low skill industries	-0.286	0.072																				
Medium/blue collar workers	-0.410	0.003																				
Medium/white collar workers	0.532	-0.003																				
High skill industries	-0.226	0.092																				
Labour intensive and low skill industries	-0.846	0.057																				
Revealed quality elasticity																						
High RQE	0.071	0.128									-0.403	-0.054	-0.219	8.111	4.906	-0.209	59.949	10.411				
Medium RQE	-0.337	0.047									-0.227	0.231	0.113	2.579	1.045	0.154	32.453	32.261				
Low RQE	0.255	-0.183									0.578	-0.111	0.127	6.107	3.165	1.526	15.106	40.365				
INNOTYPE											2009	Change 2004/2009	Change 2007/2009									
High	0.638	0.143	15.058	1.098	-0.107	-0.204	-0.406	1	0	+	0.454	n.a.	0.093						2.156	0.074	0.176	-0.097
Med-high	-0.168	-0.025	11.233	-0.211	-0.279	-1.634	-0.935	4	1	0	-0.404	n.a.	-0.101						0.345	-0.073	0.004	0.018
Med	-0.051	-0.182	18.581	-0.998	-0.118	2.045	-0.400	3	1	-	0.356	n.a.	-0.038						0.189	0.091	0.005	-0.006
Med-low	-0.045	-0.060	7.447	-0.827	-0.452	-1.724	-0.703	3	-1	+	-1.182	n.a.	-0.016						0.314	0.174	-0.026	0.030
Low	-0.096	-0.145	16.140	-0.463	-0.327	-3.298	-0.611	4	0	-	-0.826	n.a.	0.080						0.007	-0.013	0.001	-0.004
EDUTYPE																						
High	-0.319	0.143	12.841	1.483	-0.076	2.983	-0.198	5	3	-	n.a.	n.a.	n.a.									
Med-high	0.721	0.150	12.042	0.258	0.004	-15.742	-0.423	1	-1	+	n.a.	n.a.	n.a.									
Med	-0.077	-0.065	41.142	-2.148	-0.122	-3.417	-0.638	4	-1	0	n.a.	n.a.	n.a.									
Med-low	0.005	-0.051	11.697	-0.687	0.033	-0.324	-0.487	4	0	-	n.a.	n.a.	n.a.									
Low	-0.005	0.025	22.279	1.094	-0.157	1.154	-0.470	3	0	0	n.a.	n.a.	n.a.									
Total	0.000	0.000	100.000	0.000	-0.080	0.000	-0.421	2	0	0	n.a.	n.a.	n.a.	16.797	9.116	1.471	34.659	28.183	3.077	0.297	0.163	-0.049

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A25.2: Selected Sectors I - Finland

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
211	Manufacture of pulp, paper and paperboard	2.332
201	Sawmilling and planing of wood, impregnation of wood	2.020
283	Manufacture of steam generators, except central heating hot water boilers	1.645
203	Manufacture of builders' carpentry and joinery	1.375
351	Building and repairing of ships and boats	1.358
Top-3 sectors (NACE 2-digit)		
21	Pulp, paper and paperboard	2.044
20	Wood and of wood and cork	1.523
23	Coke, refined petroleum and nuclear fuel	0.580

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
322	Manufacture of television and radio transmitters and apparatus for line telephony/telegraphy	3.099
211	Manufacture of pulp, paper and paperboard	1.830
201	Sawmilling and planing of wood, impregnation of wood	1.416
283	Manufacture of steam generators, except central heating hot water boilers	0.998
311	Manufacture of electric motors, generators and transformers	0.968
Top-3 sectors (NACE 2-digit)		
32	Radio, television and communication equipment	2.288
21	Pulp, paper and paper	1.387
20	Wood and products of wood and cork	1.073

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
353	Manufacture of aircraft and spacecraft	1.298
362	Manufacture of jewellery and related articles	1.199
204	Manufacture of wooden containers	1.031
335	Manufacture of watches and clocks	0.792
283	Manufacture of steam generators, except central heating hot water boilers	0.655
181	Manufacture of leather clothes	-1.383
176	Manufacture of knitted and crocheted fabrics	-1.462
160	Manufacture of tobacco products	-1.743
323	Manuf. of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	-2.299
247	Manufacture of man-made fibres	-3.613
The 3 winning and 3 losing sectors (NACE 2-digit)		
19	Leather, leather and footwear	0.418
29	Machinery	0.368
23	Coke, refined petroleum and nuclear fuel	0.324
30	Office, accounting and computing machinery	-0.512
32	Radio, television and communication equipment	-0.826
16	Tobacco products	-1.743

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	6.086
283	Manufacture of steam generators, except central heating hot water boilers	1.865
293	Manufacture of agricultural and forestry machinery	0.779
355	Manufacture of other transport equipment n.e.c.	0.769
311	Manufacture of electric motors, generators and transformers	0.764
181	Manufacture of leather clothes	-0.599
177	Manufacture of knitted and crocheted articles	-0.606
351	Building and repairing of ships and boats	-1.051
202	Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board and other panels and boards	-1.731
211	Manufacture of pulp, paper and paperboard	-5.155
The 3 winning and 3 losing sectors (NACE 2-digit)		
32	Radio, television and communication equipment	3.276
23	Coke, refined petroleum and nuclear fuel	0.904
37	Recycling	0.561
64	Post and telecommunications	-0.303
61	Water transport	-1.634
21	Pulp, paper and paper products	-3.653

Source: Eurostat (SBS, Comext).

Table A25.3: Selected Sectors II - Finland

Revealed comparative advantage (RCA)

		RCA (export)			Export shares in price segments					
		2010	Change 1999/2010	Change 2007/2010	2009 in %	Low Change 1999/2009	Change 2007/2009	2009 in %	High Change 1999/2009	Change 2007/2009
Top-5 industries (NACE 3-digit)						in percentage points			in percentage points	
211	Manufacture of pulp, paper and paperboard	2.332	-0.001	0.144	57.906	-5.520	-12.156	4.051	1.701	2.452
201	Sawmilling and planing of wood, impregnation of wood	2.020	-0.103	0.093	56.119	8.007	31.211	1.637	1.370	-0.590
283	Manufacture of steam generators, except central heating hot water boilers	1.645	0.655	0.142	2.924	-31.932	-2.373	21.925	-11.176	6.590
203	Manufacture of builders' carpentry and joinery	1.375	-0.078	0.032	46.986	38.804	-6.078	6.954	-16.786	-8.234
351	Building and repairing of ships and boats	1.358	-0.087	-0.121	67.385	48.796	53.071	6.547	0.631	-12.441

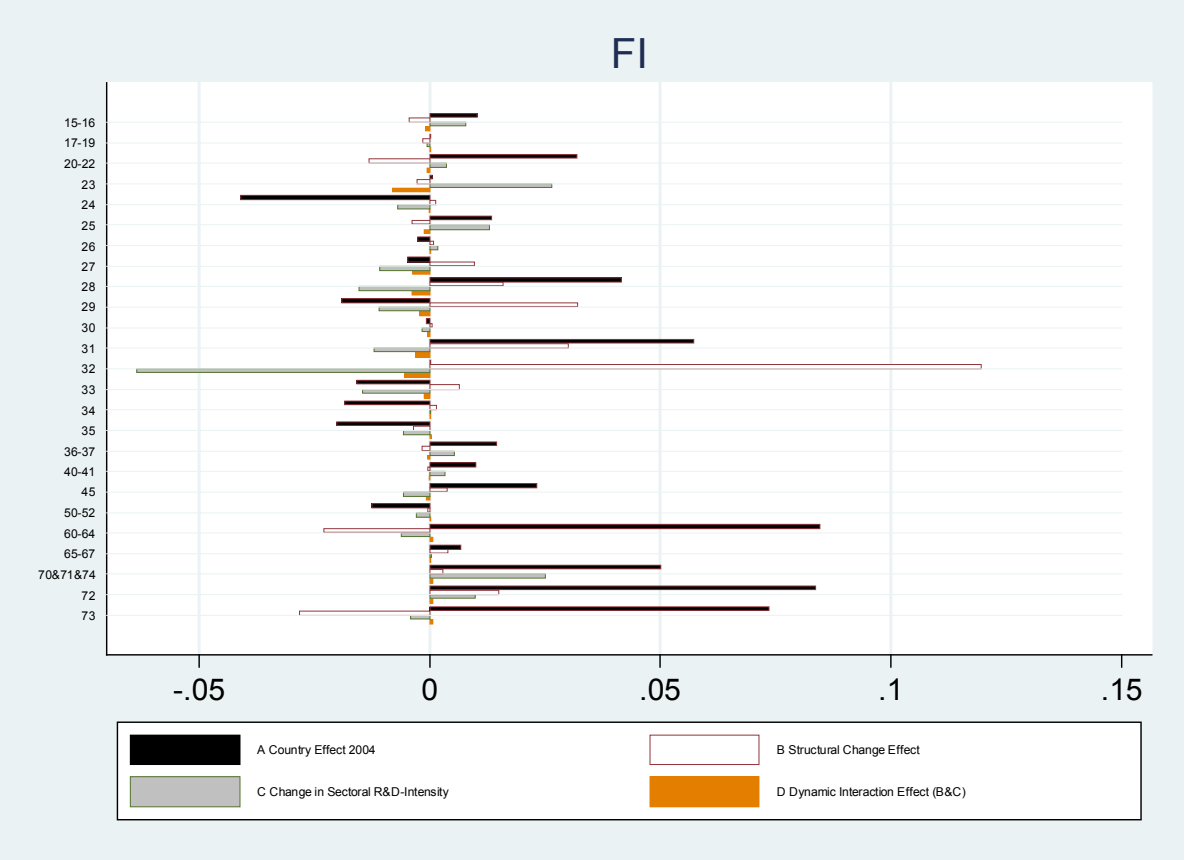
Relative value added (RVA)

		RVA		RCA (export)			Export shares in price segments				
		2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Low Change 1999/2007	Change 2007/2009	2007	High Change 1999/2007	Change 2007/2009
Top-5 industries (NACE 3-digit)								in percentage points			in percentage points	
322	Manufacture of television and radio transmitters and apparatus for line telephony/telegraphy	22.177	13.654	2.070	0.405	-1.001	0.062	-1.287	2.435	99.374	13.130	-12.759
211	Manufacture of pulp, paper and paperboard	6.236	-5.127	2.188	-0.145	0.144	70.063	6.637	-12.156	1.599	-0.751	2.452
201	Sawmilling and planing of wood, impregnation of wood	4.120	-0.130	1.927	-0.196	0.093	24.908	-23.204	31.211	2.227	1.960	-0.590
283	Manufacture of steam generators, except central heating hot water boilers	2.714	1.860	1.502	0.513	0.142	5.297	-29.559	-2.373	15.335	-17.766	6.590
311	Manufacture of electric motors, generators and transformers	2.633	0.765	0.908	-0.110	0.229	11.982	-7.284	-5.666	31.828	-12.798	5.309

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext).

Graph A25.3: Sectoral R&D decomposition: Change in structure, R&D intensity and interaction between structure and intensity, NACE-2-digit level



1.26. Sweden

Trade and industry specialisation

At the detailed manufacturing industry level, Sweden features specialisation in capital-intensive industries (pulp and paper, first processing of iron and steel), in exports, in mainstream manufacturing (isolated wire and cable, general and special purpose machinery) and in value added as well in technology-driven industries (manufacture of TV and radio transmitters and receivers). At the more aggregated sector level, Sweden is specialised in highly innovation intensive sectors (communication equipment, machinery, medical, precision, and optical instruments, R&D, software) and medium-high to medium education sectors (pulp and paper). In exports, Sweden also features specialisation in high education sectors, due to high relative shares in royalties and license fees, computer and information services and research and development. Sweden features a high share of high growth firms in highly innovative sectors, pointing to strong business dynamism.

Export quality and sectoral R&D performance

Sweden's R&D intensity is well above the average, given its industrial structure, as is its position on the quality ladder for technology-driven industries. By contrast, its position on quality indicators for labour-intensive industries is below the EU average (interestingly, just like the other Scandinavian countries). Its share of high growth firms is above the EU average. Overall, within the group of higher income countries specialised in knowledge-intensive industries, Sweden is more similar to countries featuring specialisation in knowledge-intensive manufacturing such as Germany, Austria and Finland, rather than in knowledge-intensive services.

Structural change

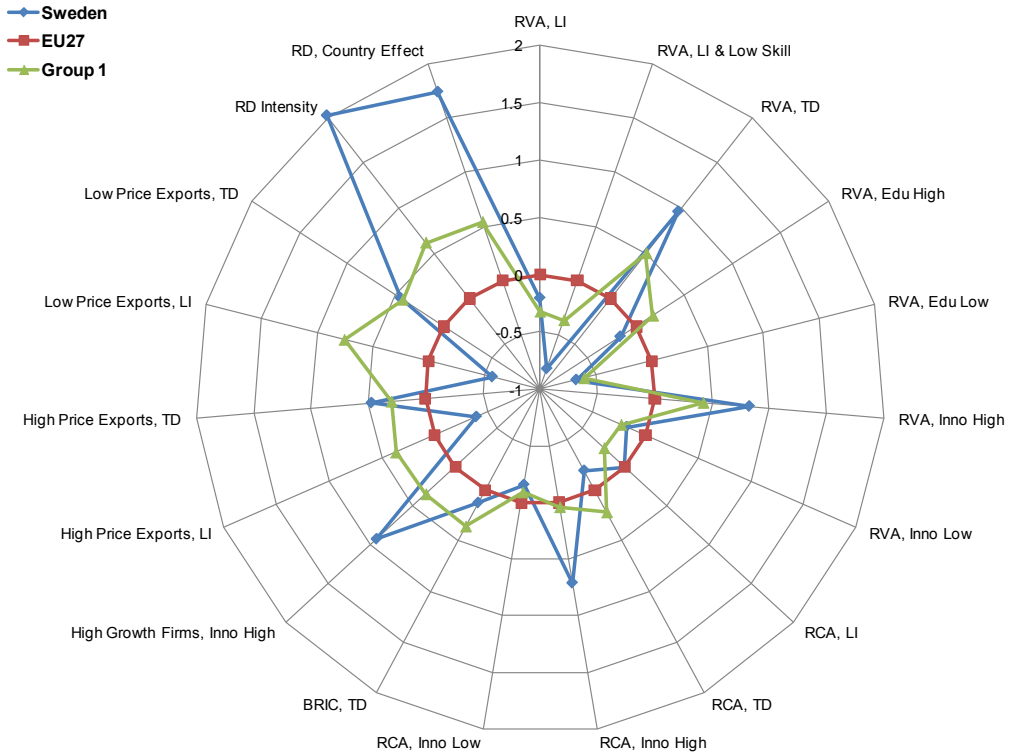
In terms of change, Sweden increased its relative share in labour-intensive industries (bodies for motor vehicles, sawmilling) while it decreased its relative share of technology-driven industries (motor vehicles, aircraft and spacecraft, radio and TV transmitters and receivers); as regards exports, Sweden gained relative shares in marketing-driven industries (prepared animal feeds, processing and preserving of fish, footwear). Furthermore, Sweden increased its relative share of high education sectors and its relative export of high innovation sectors (computers, R&D, computer and information services). Sweden improved its R&D intensity given its industrial structure, but considerably reduced its position on the quality ladder.

Overall, while Sweden enjoys a favourable position with respect to competitiveness, its pattern of change in specialisation and sectoral upgrading is mixed, with some areas improving, but other areas deteriorating.

Impact of the crisis

The crisis seems to have had a limited impact on Sweden's industrial structure.

Graph A26.1: Level



Graph A26.1: Change

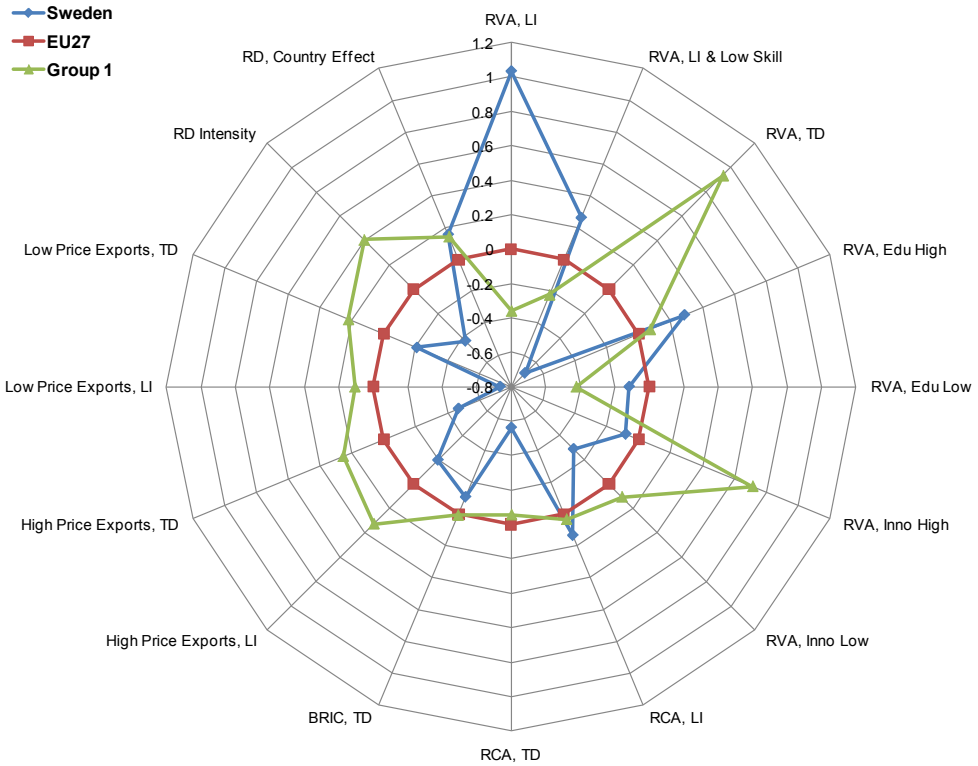


Table A26.1: Summary table - Sweden

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2007	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
Factor inputs																						
Mainstream industries	-0.078	-0.013									0.033	0.069	0.021	2.318	1.459	0.299	38.873	19.449				
Labourintensive industries	-0.095	0.135									0.000	0.072	-0.008	0.370	0.211	0.111	29.536	35.896				
Capital intensive industries	0.165	-0.012									0.293	-0.007	0.042	1.959	1.494	0.577	21.074	32.382				
Marketing driven industries	-0.400	-0.035									-0.609	0.275	0.082	0.195	0.093	0.056	34.622	21.893				
Technology driven industries	0.325	-0.046									-0.084	-0.165	-0.055	2.511	0.337	0.482	56.572	8.889				
Skill intensity																						
Low skill industries	-0.450	0.057																				
Medium/blue collar workers	0.117	-0.080																				
Medium/white collar workers	0.102	-0.005																				
High skill industries	0.231	0.059																				
Labour intensive and low skill industries	-1.232	0.207																				
Revealed quality elasticity																						
High RQE	0.136	-0.035									-0.080	-0.105	-0.054	4.035	1.799	0.638	54.449	12.382				
Medium RQE	-0.327	0.033									-0.090	0.337	0.083	1.065	0.687	0.298	27.745	28.622				
Low RQE	0.164	0.008									0.199	-0.095	0.018	2.253	1.109	0.589	26.546	27.390				
											2009	Change 2004/2009	Change 2007/2009									
INNOTYPE																						
High	0.282	-0.008	13.362	1.095	-0.462	-0.818	0.456	2	-2	+	0.234	0.088	0.054						1.404	0.427	-0.049	0.132
Med-high	-0.042	-0.099	12.324	-1.375	-0.446	-0.366	-0.337	3	-1	+	-0.203	-0.083	-0.092						1.164	0.451	-0.094	-0.025
Med	-0.010	0.004	19.800	-1.103	-0.396	-0.707	0.155	4	1	0	0.278	-0.022	0.055						0.144	0.062	-0.008	0.016
Med-low	-0.165	-0.070	8.480	-0.515	-0.481	-0.350	-0.017	2	1	-	-0.722	0.076	0.032						0.168	0.035	-0.008	0.043
Low	-0.036	-0.054	15.640	0.511	-0.364	-0.789	-0.017	2	1	0	-0.172	0.061	0.068						0.019	-0.006	0.005	0.005
EDUTYPE																						
High	-0.048	0.043	19.038	1.278	-0.412	-1.092	0.386	4	0	0	0.180	0.203	0.079									
Med-high	0.199	0.033	8.535	-1.305	-0.467	-1.098	-0.187	2	-3	+	-0.083	-0.040	0.039									
Med	0.114	-0.008	41.584	-1.780	-0.498	-1.107	0.003	5	1	0	0.173	-0.062	-0.029									
Med-low	-0.117	0.033	10.896	0.026	-0.233	-0.354	-0.218	4	1	0	-0.040	0.004	0.061									
Low	-0.146	-0.014	19.947	1.782	-0.357	0.941	-0.085	2	0	0	-0.200	0.030	-0.057									
Total	0.000	0.000	100.000	0.000	-0.380	0.000	0.056	2	-1	0	0.000	0.000	0.000	7.353	3.595	1.526	37.656	21.932	2.973	1.027	-0.155	0.197

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A26.2: Selected Sectors I - Sweden

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
201	Sawmilling and planing of wood, impregnation of wood	1.929
211	Manufacture of pulp, paper and paperboard	1.610
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	1.250
203	Manufacture of builders' carpentry and joinery	0.792
273	Other first processing of iron and steel and production of non-ECSC ferro-alloys	0.705
Top-3 sectors (NACE 2-digit)		
21	Pulp, paper and paper products	1.396
20	Wood and products of wood and cork	1.172
32	Radio, television and communication equipment	0.618

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
211	Manufacture of pulp, paper and paperboard	1.641
323	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus	1.632
201	Sawmilling and planing of wood, impregnation of wood	1.606
322	Manufacture of television and radio transmitters and apparatus for line telephony/telegraphy	1.548
342	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers	0.728
Top-3 sectors (NACE 2-digit)		
21	Pulp, paper and paper	1.082
32	Radio, television and communication equipment	0.937
20	Wood and products of wood and cork	0.854

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
157	Manufacture of prepared animal feeds	1.423
300	Manufacture of office machinery and computers	0.958
233	Nuclear fuel	0.939
152	Processing and preserving of fish and fish products	0.754
193	Manufacture of footwear	0.729
202	Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board and other	-0.688
353	Manufacture of aircraft and spacecraft	-0.748
231	Coke oven products	-0.913
323	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	-0.990
247	Manufacture of man-made fibres	-2.292
The 3 winning and 3 losing sectors (NACE 2-digit)		
30	Office, accounting and computing machinery	0.958
16	Tobacco products	0.650
18	Wearing apparel, dressing and dyeing of fur	0.563
34	Motor vehicles, trailers and semi-trailers	-0.099
35	Transport equipment	-0.325
32	Radio, television and communication equipment	-0.346

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
323	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	4.221
342	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers	1.406
152	Processing and preserving of fish and fish products	0.777
201	Sawmilling and planing of wood, impregnation of wood	0.768
286	Manufacture of cutlery, tools and general hardware	0.614
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	-0.402
332	Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes	-0.587
154	Manufacture of vegetable and animal oils and fats	-0.673
341	Manufacture of motor vehicles	-0.850
296	Manufacture of weapons and ammunition	-0.980
The 3 winning and 3 losing sectors (NACE 2-digit)		
71	Renting of machinery and equipment	0.607
70	Real estate activities	0.571
20	Wood and products of wood and cork	0.387
62	Air transport	-0.346
34	Motor vehicles, trailers and semi-trailers	-0.411
61	Water transport	-0.806

Source: Eurostat (SBS, Comext).

Table 26.3: Selected Sectors II - Sweden

Revealed comparative advantage (RCA)

		RCA (export)			Export shares in price segments					
					Low			High		
		2010	Change 1999/2010	Change 2007/2010	2009 in %	Change 1999/2009	Change 2007/2009	2009 in %	Change 1999/2009	Change 2007/2009
Top-5 industries (NACE 3-digit)						in percentage points			in percentage points	
201	Sawmilling and planing of wood, impregnation of wood	1.929	0.105	0.078	71.058	42.277	63.169	0.166	-0.107	0.058
211	Manufacture of pulp, paper and paperboard	1.610	0.105	0.058	22.091	-2.890	-5.763	14.113	7.526	5.126
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	1.250	-0.232	0.120	15.610	6.183	0.182	38.230	-3.476	16.665
203	Manufacture of builders' carpentry and joinery	0.792	-0.481	-0.220	31.848	25.512	18.067	28.686	-17.518	-8.835
273	Other first processing of iron and steel and production of non-ECSC ferro-alloys	0.705	-0.116	0.040	8.338	1.743	-1.967	26.927	-23.330	1.569

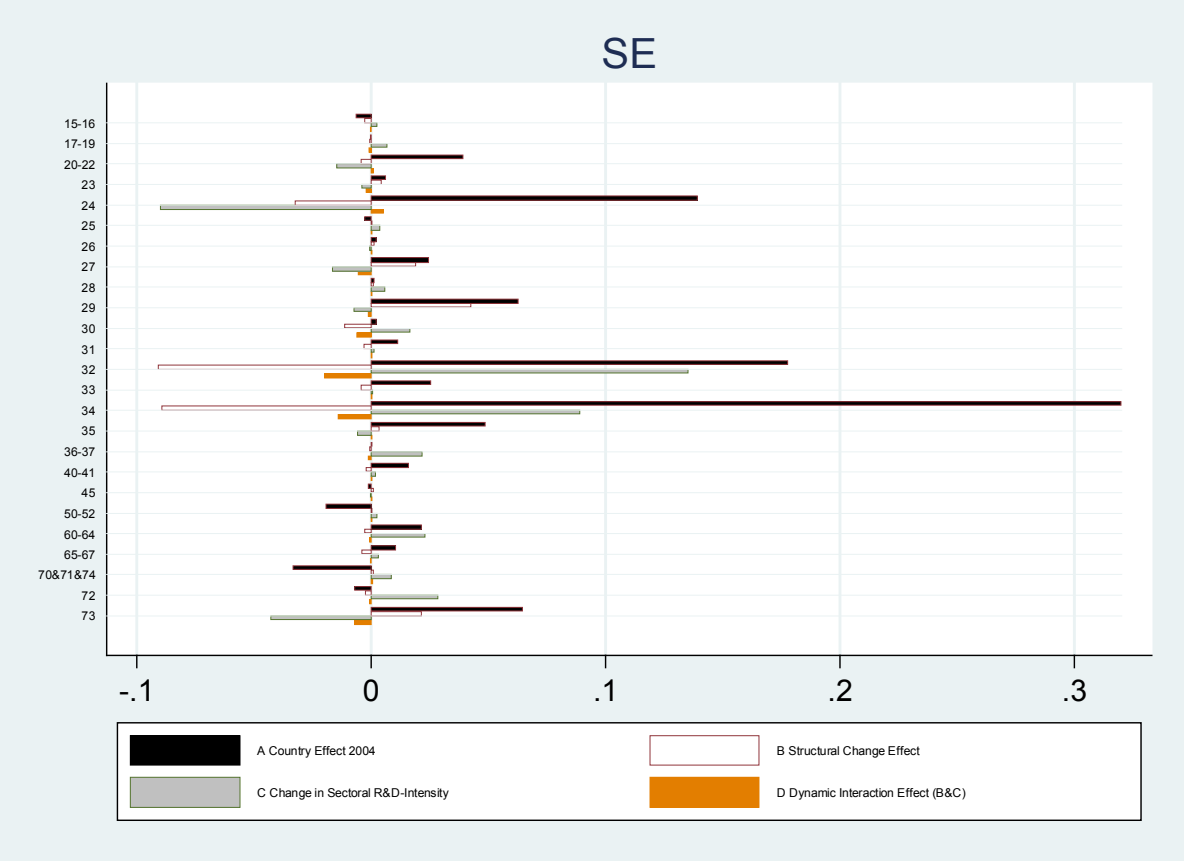
Relative value added (RVA)

		RVA		RCA (export)			Export shares in price segments				
							Low			High	
		2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Change 1999/2007	Change 2007/2009	2007	Change 1999/2007	Change 2007/2009
Top-5 industries (NACE 3-digit)								in percentage points			in percentage points	
211	Manufacture of pulp, paper and paperboard	5.162	0.344	1.551	0.046	0.058	27.854	2.873	-5.763	8.987	2.400	5.126
323	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus	5.116	4.182	0.002	-1.056	0.067	6.196	2.611	-1.708	19.577	-53.804	0.553
201	Sawmilling and planing of wood, impregnation of wood	4.982	0.309	1.851	0.026	0.078	7.889	-20.891	63.169	0.108	-0.165	0.058
322	Manufacture of television and radio transmitters and apparatus for line telephony/telegraphy	4.702	1.202	1.131	-0.352	0.120	15.428	6.001	0.182	21.565	-20.141	16.665
342	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers	2.072	1.445	0.716	0.048	-0.161	0.173	-2.636	1.096	94.474	-0.797	-19.290

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext).

Graph A26.3: Sectoral R&D decomposition: Change in structure, R&D intensity and interaction between structure and intensity, NACE-2-digit level



1.27. United Kingdom

Trade and industry specialisation

At the detailed manufacturing industry level, the United Kingdom features specialisation in technology driven industries (aircraft and spacecraft, computers, radio and TV receivers, instruments for measuring, pharmaceuticals), in value added as well in marketing-driven industries (grain mill products, publishing and printing). At the more aggregated sector level, the UK is specialised in educationally highly intensive industries (financial services, research and development, software) and in sectors with medium innovation intensity (air transport, business services). The UK achieves a high share of exports to the BRIC countries, indicating growth potential.

Export quality and sectoral R&D performance

The UK's R&D intensity is above average, given its industrial structure, showing particularly high sectoral R&D intensity in pharmaceuticals and transport equipment (aircraft). Its position on the quality ladder is mostly above the EU average, with the exception of the low quality segment in technology-driven industries, where it is on a par with the EU average. Overall, within its group of higher income countries specialised in knowledge-intensive industries, the UK is more similar to France, Belgium and the Netherlands with its specialisation in knowledge-intensive services.

Structural change

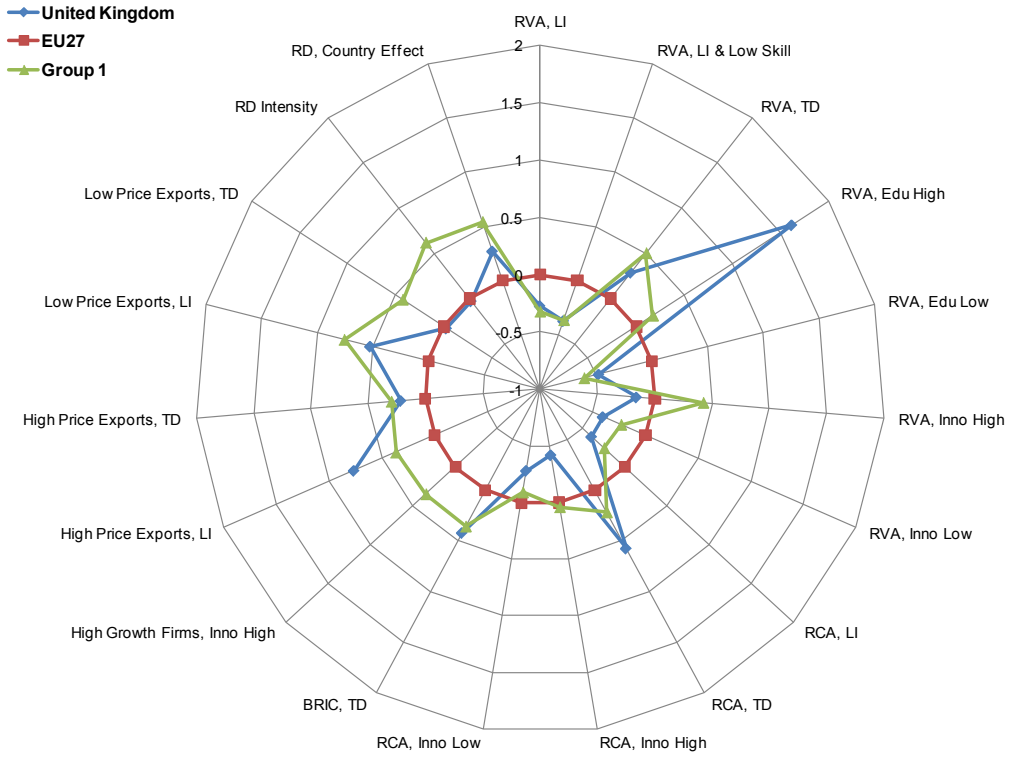
In terms of change, the United Kingdom has further increased its industry specialisation in high education sectors (R&D, business services) but decreased its export specialisation of high education sectors (computers, software), as well as its relative share in labour-intensive industries (wooden containers, leather clothes) and in highly innovation intensive sectors (communication equipment). It has increased relative value added in marketing driven industries (processing of fish) and revealed comparative advantage in capital-intensive industries (nuclear fuel, coke oven products). The UK has increased its export share in the high price segments of labour-intensive and technology-driven industries, pointing to a favourable movement on the quality ladder. However, it has slightly decreased its R&D intensity, taking into account its industrial structure.

Overall, the UK enjoys a favourable position with respect to competitiveness, but its pattern of change sends mixed signals, with some areas improving and other areas deteriorating.

Impact of the crisis

In the UK, the crisis has clearly favoured technology-driven and labour-intensive industries, at the expense of the other industry types.

Graph A27.1: Level



Graph A27.2: Change

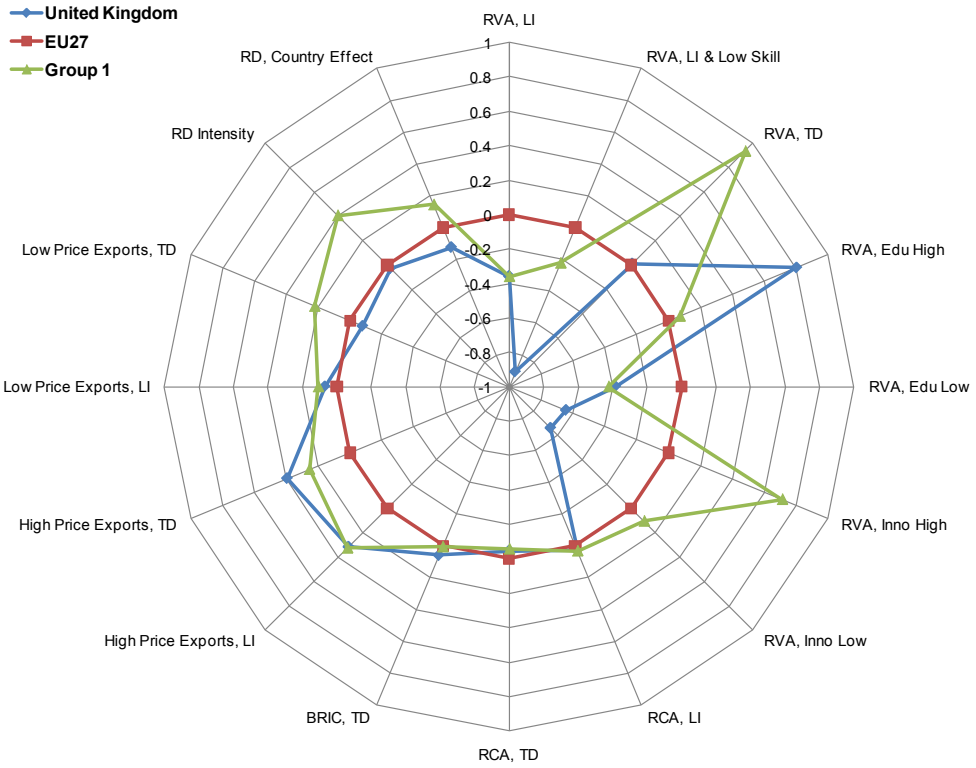


Table A27.1: Summary table - United Kingdom

	Relative value added		Value added shares		Relative Business Fluctuation	Relative Net Entry	High growth firms, relative to EU	RLP level		RLP growth	RCA			Exports to BRIC as percent of total exports			Export Shares in high price segment as %	Export Shares in low price segment as %	R&D intensity	R&D Decomposition Country effect	R&D Decomposition Structural change effect	Change in sectoral R&D intensity
	2007	Change 1999/2007	2007	Change 1999/2007	2006	2007	2007	2007	Change 1999/2007	Average change 1999/2007	2010	Change 1999/2010	Change 2007/2010	2010	Change 1999/2010	Change 2007/2010	2009	2009	2007	2007	Change 2004/2007	Change 2004/2007
																Percentage points						
Factor inputs																						
Mainstream industries	-0.138	-0.020									-0.226	-0.094	-0.098	1.322	0.728	0.138	41.813	18.924				
Labourintensive industries	-0.126	-0.044									-0.329	0.020	0.010	0.280	0.132	0.033	49.011	21.773				
Capital intensive industries	-0.300	-0.013									0.005	0.120	-0.029	1.656	1.258	0.455	30.576	42.815				
Marketing driven industries	0.284	0.082									-0.113	-0.033	-0.069	0.396	0.199	0.056	34.397	25.237				
Technology driven industries	0.110	0.001									0.218	-0.011	0.065	2.848	2.093	1.001	51.045	15.698				
Skill intensity																						
Low skill industries	-0.017	0.023																				
Medium/blue collar workers	-0.156	0.000																				
Medium/white collar workers	0.089	-0.007																				
High skill industries	0.087	-0.005																				
Labour intensive and low skill industries	-0.388	-0.245																				
Revealed quality elasticity																						
High RQE	-0.062	-0.027									0.121	0.109	0.064	3.658	2.626	1.166	47.947	19.467				
Medium RQE	0.076	-0.008									-0.043	-0.164	-0.042	1.017	0.504	0.123	31.323	31.783				
Low RQE	-0.025	0.058									-0.201	-0.015	-0.096	1.827	1.280	0.394	43.858	24.027				
											2009	Change 2004/2009	Change 2007/2009									
INNOTYPE																						
High	-0.064	-0.090	7.637	-1.585	0.154	0.136	n.a.	1	0	0	-0.168	-0.179	-0.048						0.336	-0.198	-0.015	0.002
Med-high	-0.255	-0.168	9.845	-2.954	0.199	-3.798	n.a.	2	-1	0	-0.132	0.057	0.044						0.665	0.204	0.016	-0.018
Med	0.181	0.057	26.377	5.386	0.256	2.617	n.a.	2	0	+	0.504	0.077	-0.052						0.057	-0.021	0.002	0.007
Med-low	-0.051	-0.058	8.148	-1.657	0.399	-2.227	n.a.	1	-1	0	-0.007	0.010	0.088						0.131	-0.016	-0.005	0.050
Low	-0.085	-0.126	12.269	-1.610	0.104	-2.331	n.a.	4	1	0	-0.343	-0.065	0.017						0.026	-0.014	0.005	-0.006
EDUTYPE																						
High	0.381	0.079	27.236	6.910	0.250	2.422	n.a.	3	0	+	0.719	-0.075	-0.145									
Med-high	-0.132	-0.224	7.875	-1.327	0.265	-3.074	n.a.	2	0	-	0.101	0.029	0.085									
Med	-0.120	0.026	31.175	-3.983	0.068	-2.220	n.a.	3	-1	0	-0.363	-0.058	-0.024									
Med-low	-0.037	-0.074	11.705	-1.470	0.203	-2.717	n.a.	5	1	0	-0.295	-0.073	0.010									
Low	-0.100	-0.044	22.009	-0.130	0.202	-1.942	n.a.	2	-1	0	-0.358	0.006	-0.021									
Total	0.000	0.000	100.000	0.000	0.201	0.000	n.a.	3	1	0	0.000	0.000	0.000	6.502	4.410	1.683	42.571	23.802	1.223	-0.051	0.003	0.036

Source: OECD (STAN), Eurostat (SBS, Comext), EUKLEMS.

Table A27.2: Selected Sectors I - United Kingdom

Revealed comparative advantage (RCA)

		2010
Top-5 industries (NACE 3-digit)		
233	Nuclear fuel	1.317
296	Manufacture of weapons and ammunition	1.154
221	Publishing	1.115
353	Manufacture of aircraft and spacecraft	0.935
362	Manufacture of jewellery and related articles	0.890
Top-3 sectors (NACE 2-digit)		
22	Printing, publishing and reproduction	0.761
35	Other transport equipment	0.702
23	Coke, refined petroleum and nuclear fuel	0.478

Relative value added (RVA)

		2007
Top-5 industries (NACE 3-digit)		
353	Manufacture of aircraft and spacecraft	1.021
296	Manufacture of weapons and ammunition	0.894
221	Publishing	0.738
366	Miscellaneous manufacturing n.e.c.	0.664
156	Manufacture of grain mill products, starches and starch products	0.595
Top-3 sectors (NACE 2-digit)		
73	Research and development	0.580
72	Computer and related activities	0.506
62	Air transport	0.413

Absolute change of the revealed comparative advantage (RCA)

		Change 1999/2010
The 5 winning and 5 losing industries (NACE 3-digit)		
296	Manufacture of weapons and ammunition	1.905
362	Manufacture of jewellery and related articles	1.024
353	Manufacture of aircraft and spacecraft	0.913
233	Nuclear fuel	0.879
231	Coke oven products	0.538
300	Manufacture of office machinery and computers	-0.786
352	Manufacture of railway, tramway locomotives, rolling stock	-0.922
264	Manufacture of bricks, tiles and construction products	-1.007
160	Manufacture of tobacco products	-1.392
204	Manufacture of wooden containers	-1.403
The 3 winning and 3 losing sectors (NACE 2-digit)		
35	Other transport equipment	0.766
23	Coke, refined petroleum and nuclear fuel	0.324
36	Furniture, jewellery, musical instruments, sports goods, games and toys	0.298
32	Radio, television and communication equipment	-0.621
30	Office, accounting and computing machinery	-0.786
16	Tobacco products	-1.392

Absolute change of the relative value added (RVA)

		Change 1999/2007
The 5 winning and 5 losing industries (NACE 3-digit)		
152	Processing and preserving of fish and fish products	0.601
296	Manufacture of weapons and ammunition	0.599
203	Manufacture of builders' carpentry and joinery	0.590
323	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods	0.467
266	Manufacture of articles of concrete, plaster, cement	0.416
242	Manufacture of pesticides and other agro-chemical products	-0.599
181	Manufacture of leather clothes	-0.612
177	Manufacture of knitted and crocheted articles	-0.617
223	Reproduction of recorded media	-0.647
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	-0.714
The 3 winning and 3 losing sectors (NACE 2-digit)		
70	Real estate activities	0.482
73	Research and development	0.395
16	Tobacco products	0.373
30	Office, accounting and computing machinery	-0.460
35	Other transport equipment	-0.530
32	Radio, television and communication equipment	-0.531

Source: Eurostat (SBS, Comext).

Table A27.3: Selected Sectors II - United Kingdom

Revealed comparative advantage (RCA)

		RCA (export)			Export shares in price segments					
		2010	Change 1999/2010	Change 2007/2010	2009 in %	Low Change 1999/2009	Change 2007/2009	2009 in %	High Change 1999/2009	Change 2007/2009
Top-5 industries (NACE 3-digit)						in percentage points			in percentage points	
233	Nuclear fuel	1.317	0.879	0.011	5.992	4.907	-7.371	0.000	-94.910	-72.058
296	Manufacture of weapons and ammunition	1.154	1.905	1.488	18.733	2.115	13.483	60.765	-0.628	-12.144
221	Publishing	1.115	0.287	-0.015	19.136	9.207	10.029	40.661	-22.162	-2.216
353	Manufacture of aircraft and spacecraft	0.935	0.913	0.503	1.027	-1.728	-0.583	76.566	-4.689	5.558
362	Manufacture of jewellery and related articles	0.890	1.024	0.224	5.107	-7.110	-2.374	89.097	39.422	1.378

Relative value added (RVA)

		RVA		RCA (export)			Export shares in price segments					
		2007	Change 1999/2007	2007	Change 1999/2007	Change 2007/2010	2007	Low Change 1999/2007	Change 2007/2009	2007	High Change 1999/2007	Change 2007/2009
Top-5 industries (NACE 3-digit)								in percentage points			in percentage points	
353	Manufacture of aircraft and spacecraft	2.775	0.161	0.432	0.410	0.503	1.611	-1.145	-0.583	71.008	-10.247	5.558
296	Manufacture of weapons and ammunition	2.445	0.650	-0.334	0.417	1.488	5.250	-11.368	13.483	72.909	11.516	-12.144
221	Publishing	2.092	0.393	1.130	0.302	-0.015	9.107	-0.822	10.029	42.877	-19.946	-2.216
366	Miscellaneous manufacturing n.e.c.	1.943	0.110	0.015	0.017	-0.080	26.187	7.417	6.255	36.170	-10.382	-6.685
156	Manufacture of grain mill products, starches and starch products	1.813	0.192	0.223	0.060	-0.140	20.012	-23.719	0.350	42.735	20.416	-13.329

Remark: RVA not in logarithmic form (above 1 = above average).

Source: Eurostat (SBS, Comext).

Graph A27.3: Sectoral R&D decomposition: Change in structure, R&D intensity and interaction between structure and intensity, NACE-2-digit level