

# EU Wholesale Trade: Analysis of the Sector and Value Chains

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# Abstract

This report investigates wholesale as one of the main service industries in the European economy. Wholesale is the resale of new and used goods to retailers, industrial, commercial, institutional or professional users, or to other wholesalers on their own account or for third parties. It plays a pivotal role in the European Single Market by bridging national markets and connecting producers, retail trade and industrial demand across Europe. Wholesale employs about 10 million persons in the EU-28 and accounts for a share of 7-9% in total employment in most EU Member States. The share of micro and small enterprises is considerably higher than in manufacturing. The sector reveals considerable heterogeneity in terms of firm size, productivity and profitability across EU Member States and wholesale sub-sectors. Moreover, the report sheds light on the integration of the wholesale sector in value chains with upstream manufacturers and downstream retailers, and on the role of technology and innovation in wholesale.

Keywords: wholesale, EU integration, value chains, services, innovation

JEL classification: L16, L81



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## Executive summary

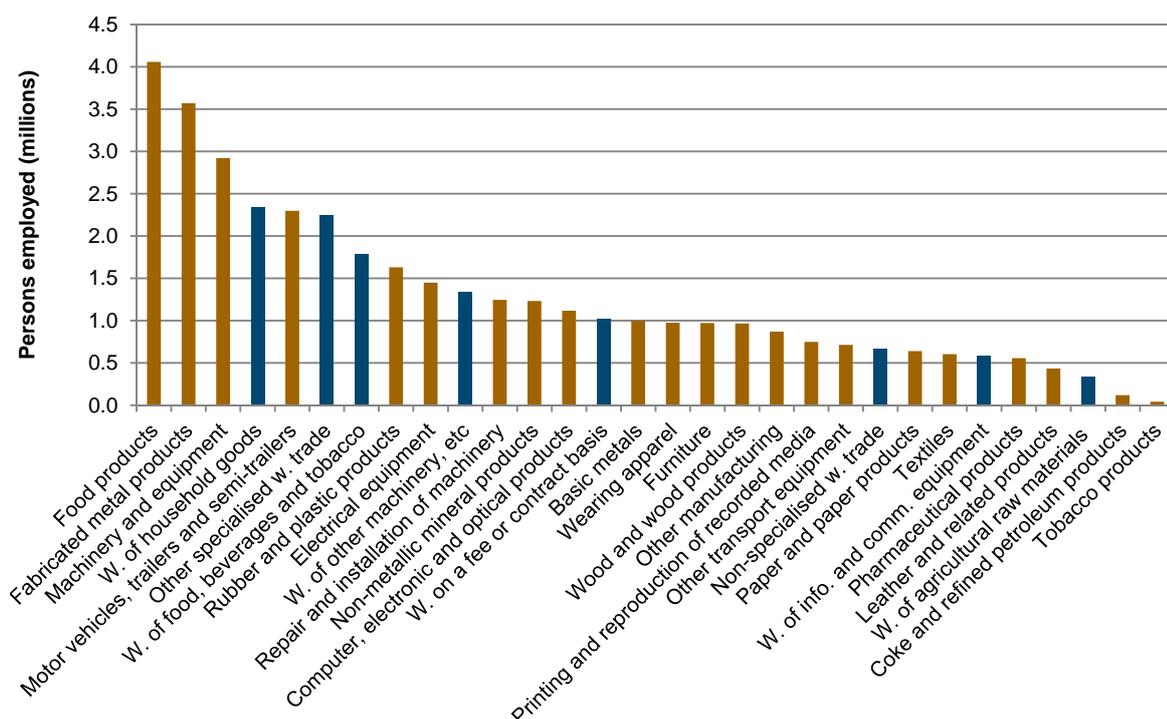
This report investigates the importance of wholesale as one of the main service industries in the European economy. Wholesale is the resale of new and used goods to retailers, industrial, commercial, institutional or professional users, or to other wholesalers on their own account or for third parties.

### The economic significance of wholesale

Wholesale employs about 10 million persons in the EU-28. Employment in the wholesale sector has remained roughly stable over the last five years. Wholesale activities are quite evenly distributed across the EU, with a share of 7–9% of total employment in most Member States. Greece and Denmark stand out as particularly specialising in wholesale.

The wholesale sector is about the same size as tourism and transport, but is smaller than retail trade and manufacturing. However, if we examine manufacturing and wholesale sub-sectors, there are industries with considerable employment shares in both parts. For example, the sub-sectors wholesale of household goods and other specialised wholesale trade employ roughly the same number of persons as the EU automotive industry (see figure below).

### Comparison of the number of persons employed in manufacturing and wholesale sub-sectors, EU-28, 2013

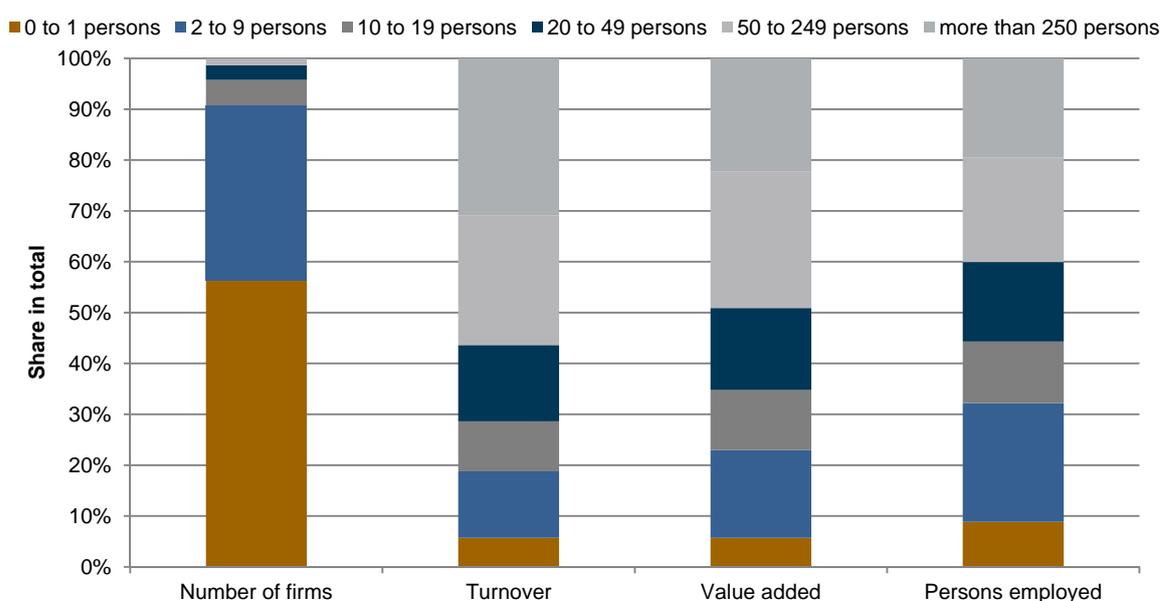


Source: Eurostat, Structural Business Statistics (sbs\_na\_ind\_r2, sbs\_na\_dt\_r2), own calculations.

There are about 1.8 million wholesale firms in the EU-28, 90% of them micro and small enterprises (the average firm size is 5.7 persons, compared to 14.3 persons in manufacturing). The share of micro and small enterprises is considerably higher than in manufacturing, and thus wholesale provides opportunities for self-employment. However, the share of large firms in turnover, employment and value added is smaller in wholesale than in manufacturing, which points to a lower concentration in the wholesale sector.

Wholesale firms on average reveal similar productivity to manufacturing and higher productivity than retail trade. Productivity in wholesale increases with firm size. Differences in profitability are smaller but still notable. We found convergence in the form of a decreasing between-country variance in the period 2000–2013. However, the comparison of annual growth rates and initial profitability suggests that this convergence is due to the fact that the majority of countries are falling behind in productivity.

### Share of different size classes in terms of the number of persons employed in wholesale, retail trade and manufacturing, EU-27, 2013



Note: No data for Ireland available.

Source: Eurostat, Structural Business Statistics, own calculations.

Wholesale provides a genuine economic function in the European economy; in a value chain perspective, it is an input to almost all production processes. This input of wholesale trade accounts for about 5% of gross output. In the five value chains analysed, we find the highest share of wholesale inputs in food and beverages and the lowest in construction.

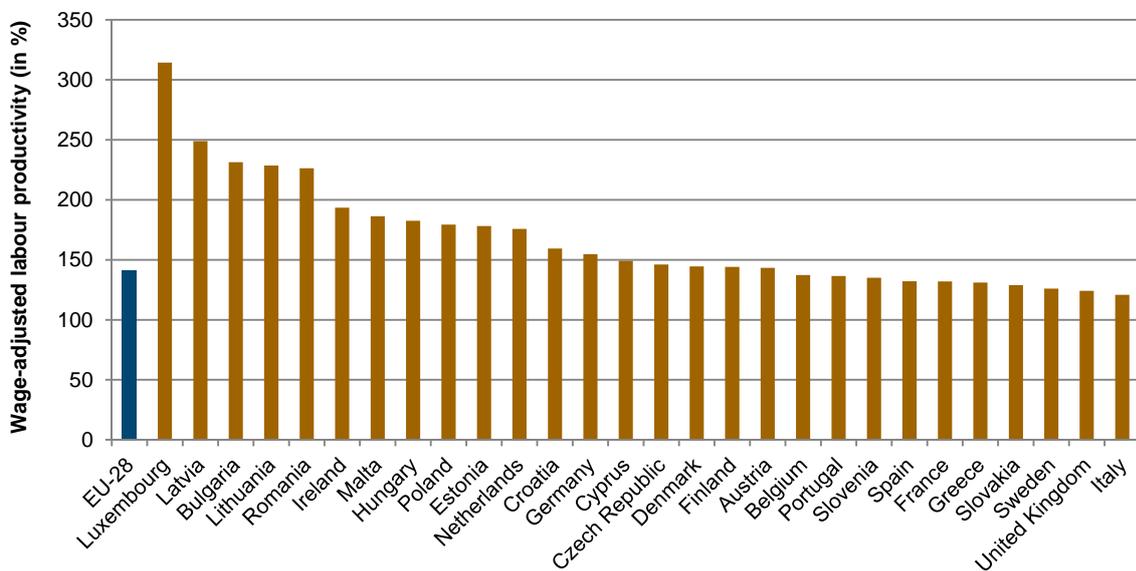
### The heterogeneity of wholesale

Despite the pervasiveness of wholesale, a closer look at indicators at the country level reveals a very diverse picture in the EU. There are considerable differences in terms of firm size, productivity and profitability across EU Member States. For example, German, Danish and UK wholesale firms are twice

as large as firms in Poland or the Netherlands, and three times as large as firms in the Czech Republic, Slovakia or Italy.

The average person employed in the most productive wholesale sub-sector (wholesale of tobacco products) generates three and a half times the value added of the average person employed in the least productive sub-sector (agents involved in the sale of a variety of goods). At the country level we find the highest productivity in Northern and Western European countries and the lowest in Romania, Bulgaria and Slovakia. These differences, however, shrink but are still noticeable when we correct for wage differences (see figure below).

### Wage-adjusted labour productivity across EU countries in wholesale, 2013



Note: Values reflect value added at factor cost per person employed as a share of wage costs. Ireland, value of 2012.  
Source: Eurostat, Structural Business Statistics, own calculations.

One reason for this heterogeneity is that large parts of the wholesale sector are very integrated along the value chain with upstream manufacturers and downstream retailers. Obviously, a wholesaler in the clothing sector has much more in common with clothing manufacturers and retailers than with a wholesale firm trading in oranges. One of the factors that contribute to this heterogeneity is sector-specific regulation. Another is that different wholesale sub-sectors offer very different types of services. After-sales services – such as the rapid delivery of spare parts – are an essential task for the services provided by wholesale of construction machinery, yet they have no role to play in food and beverages wholesale.

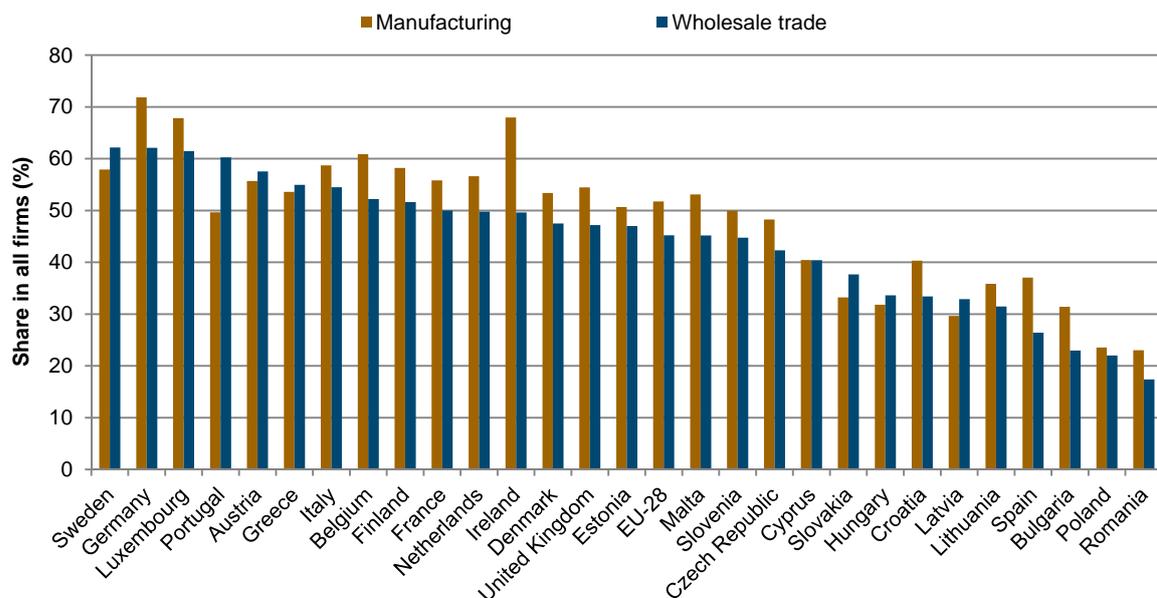
The integration along the value chain also promotes heterogeneity in terms of actors. Three principal types of wholesale firms can be distinguished according to ownership. First, there are firms which are the wholesale divisions of domestic manufacturing, utilities or retail firms which are legally independent, but nevertheless embedded in the strategies and activities of their parent enterprise groups. Second, there are genuine wholesalers, many of them micro and small enterprises with a high share of self-employment. Third, a considerable portion of the wholesale sector consists of affiliates of multinational

manufacturing firms, which act as national representatives for the products of their parent companies. The share of these firms is around 15–30% of employment, and even more of value added. Foreign-owned firms account for a higher share of the total number of firms and value added than in manufacturing. There are considerable differences in productivity between foreign and domestic wholesalers, and these make foreign investment in wholesale a driver of productivity growth.

### The role of technology and innovation in wholesale

Services are often considered as innovation laggards compared to manufacturing, but this is not true of wholesale. Wholesale has a similar share of innovative firms as manufacturing. However, wholesale firms are less frequently engaged in research and development (R&D) and more often employ external technologies. The economic returns to innovation in wholesale are below those of manufacturing firms.

### Share of innovative firms in manufacturing and wholesale as a percentage of all firms per sector, different EU Member States, 2010–2012



Source: Eurostat Community Innovation Survey 2012, own calculations.

An important part of innovation activities in wholesale are new information technologies. There is evidence that wholesalers are very active in e-commerce, and make considerable efforts in this field. Expenditure on tangible investments, such as buildings, machines or transport equipment, dropped considerably in wholesale after the crisis and has not yet recovered. On average, wholesale sectors spend less per employee on tangible investments than manufacturing, but considerably more than retail trade.

Despite predictions of a decline in wholesale activity due to disintermediation and the diffusion of e-commerce, input-output data indicate that the magnitude of wholesale inputs into production processes is relatively stable over time. One reason for this stability is that wholesale firms themselves are moving into e-commerce. Moreover, wholesale firms provide a range of services other than trade. An example of this is after-sales services, as highlighted in the case study on wholesale of construction machinery.

## Wholesale and the single market

Wholesale trade can contribute to the integration of the European single market by bridging national markets and connecting producers, retail trade and industrial demand across Europe. Convergence in productivity and profitability between countries would be a sign that wholesale is on the way towards this goal, because the free flow of goods and capital would bring foreign competition into high-margin markets and would raise productivity and reduce extra-normal profits in these markets. However, the figures show virtually no convergence in productivity levels since 2000, and only a slow trend towards convergence in profitability.

This leads to the conclusion that considerable barriers to the single market still exist in wholesale services. One of these barriers is the practice among manufacturing firms of preventing parallel imports. However, there is a lack of systematic evidence of this practice, apart from information on single sectors (IDEA Consult et al. 2011; Prognos 2014). Another barrier is the difference in national regulation, which leads to higher costs for wholesalers active in more than one European country.

There are also other indications of a large degree of heterogeneity in wholesale. For example, differences in labour productivity levels can also be found at the 2-digit sub-sector and even at the 4-digit level below.

## Sectoral value chains in wholesale

Selected evidence is presented on the role and magnitude of wholesale trade services in the EU and individual Member States, based on information provided in the supply and use tables and the input-output tables. In the input-output framework, wholesale activities are an additional cost that a purchaser of products (like a firm buying intermediates from other firms) has to bear. To account for sectoral value chains, wholesalers and retailers are treated as supplying services and their output is measured by the total value of the trade margins realised on the goods they purchase for resale.

First, we find that wholesale services are mainly offered by the trade sector. Manufacturing plays a minor role in the provision of wholesale activities. So from an input-output perspective, there is little indication that disintermediation (for example by manufacturing firms offering over wholesale services) actually takes place. Second, trade and transport margins account for about 15% of the total supply of manufacturing products in purchasers' prices. This figure is relatively stable over time; however, significant differences across countries can be observed.

Third, the share of wholesale trade on total costs (as a percentage of gross output) for manufacturing industries is quite stable over time; it accounts for about 5% of total costs, although there are differences across countries (in terms of both magnitude and trends).

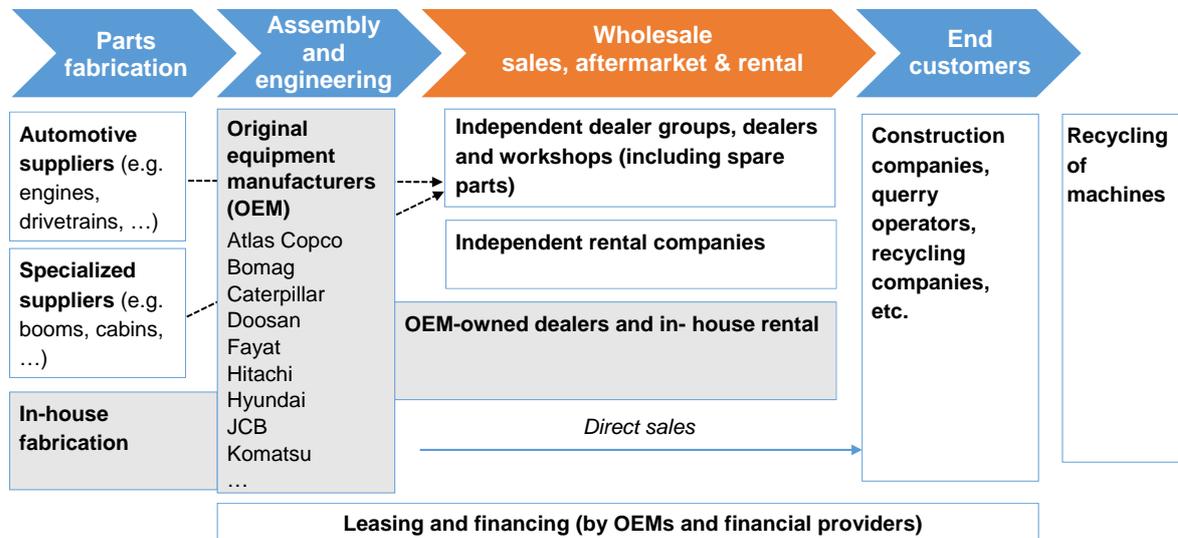
Fourth, these observations also apply to different value chains, although there are some differences in their magnitude. We considered five different value chains. The direct cost share of wholesale trade in food and beverages and in textiles is about 6–7% (of gross output), whereas in machinery and transport equipment it is about 4%; and in construction it is about 2.5% (for this industry, the share of intermediates in gross output is significantly lower). These figures are similar to those obtained when we consider value added created along the value chains (i.e. direct and indirect costs).

### Case study: Wholesale of mining, construction and civil engineering machinery

A case study on wholesale of mining, construction and civil engineering machinery provides insights into this specific part of wholesale in the EU. A major conclusion from the analysis is that heterogeneity exists even in this – at first sight, well-delimited – sub-sector of wholesale, as the value chain and the role of wholesale may differ depending on the type of machinery, its size, the size of the firms, etc.

Wholesale of mining, construction and civil engineering machinery is first characterised by dense interrelations in the value chain: since wholesalers are the only connection between manufacturer and final customer, they are an important link in the value chain. The importance of wholesalers is expected to become even more important in the future, due to the increased cooperation between manufacturers and wholesalers. This cooperation is fuelled by a need to respond better to increasing customer needs, in order to create added value in the construction sector, which is under pressure and is becoming more complex. This may lead to vertical integration in the value chain. The upstream players in the value chain often operate on a global scale (in particular broad-range manufacturers and manufacturers in niche markets), while the downstream players operate on a local or regional scale, due to the need for proximity to the client in the event of machine failure.

### Value chain of mining, construction and civil engineering machinery



Source: Based on McKinsey & Company (2016).

In total, the sector accounts for approximately 10,000 firms across Europe in 2013. This number increased by 16% between 2008 and 2013, due to emerging businesses in Poland, Germany and the Netherlands. In contrast to this considerable growth in the number of enterprises, employment in the sector decreased significantly over the same period, by almost 12%: in 2013, some 81,000 people were active in the sector. German wholesalers account for more than a quarter of the total value added at factor cost in Europe.

Compared to the manufacturers of mining, construction and civil engineering machinery, wholesalers in these products are less vulnerable to volatility because of the provision of maintenance and after-sales

services. This diversification in their service portfolio provides a buffer against any immediate downturn in investments. However, the fact remains that growth of the sector largely depends on the construction (and mining) industry, which has lost considerable employment since 2008. The impact has been felt most strongly in the Southern European Member States. Growth of the sector is expected to increase in the future due to a recovery in demand by final customers and due to after-sales services, which are traditionally the segment with the highest value added.

The regulation of mining, construction and civil engineering machinery in the EU is an excellent example of the tight linkages between wholesale and the upstream producing sectors. This regulation is very much sector specific, and is of only minor importance for other parts of the wholesale sector outside the sector of this case study. Other parts of the wholesale sector are regulated by similar frameworks, and these are one important reason for the strong segmentation and heterogeneity of wholesale. Most regulations are harmonised at the European level – but not all, in particular the road circulation requirements for non-road mobile machinery that occasionally goes on the road. The lack of harmonisation in this respect remains a major barrier to the creation of a single market, especially in the upstream segments of the value chain. Wholesalers are also impacted if they want to provide their services (mainly sales and renting of machinery) across borders. In addition, the lack of market surveillance causes major impediments to the creation of a single market. Even with regulatory reforms implemented, market surveillance will remain challenging because of the complexity of the machinery.

### **Implications for policy**

It is difficult to come up with conclusions for a sector where ‘everything one says is right and wrong at the same time, depending on what part of the sector you look at’, as one interview partner maintained. The study nevertheless provides some implications for policy.

First, the statistical basis for policy has to be improved. In some statistics, there is no separation between wholesale and retail, which are two very different sectors. In input-output data, wholesale is lumped together with retail trade and transport. In other fields, such as productivity, it would make sense to differentiate between independent wholesale firms and wholesale affiliates of enterprise groups. This could be done, for example, by distinguishing in the statistical data between wholesale firms that only sell the products of their own company group and wholesale firms that trade their own and third-party products. Moreover, data on territorial supply constraints and restrictions on parallel imports would be welcome, in order to gain insight into the barriers to the single market.

Second, the heterogeneity of wholesale activities makes it difficult to imagine a policy for the whole wholesale sector. With respect to wholesale, we suggest that it would make more sense for policy to focus on sectoral value chains, which include manufacturing as well as wholesale activities, rather than to focus on the wholesale sector or sub-sectors. A good example of this idea is sector-specific regulation.

Third, another important topic for policies targeted at sectoral value chains is the removal of barriers to the internal market. The lack of convergence in productivity and profitability between Member States indicates that such barriers exist. In particular, policy should have an eye to barriers to parallel imports across borders within the single market. We found no data that would indicate the size of these barriers in different sectors; however, we gleaned evidence from interviews and studies that they exist. Future

research that focuses on these barriers would therefore be an important step towards the completion of the single market.

Moreover, the case study indicated that, despite great harmonisation efforts in recent years, there are still national regulations in place that impose costs on wholesale firms when they do business outside their home country. Again, this is a topic that is not only relevant for wholesale, but for whole sectoral value chains. We are also aware of the tensions between the benefits of trans-European regulation and the subsidiarity principle. Nevertheless, national regulation may still be a barrier in some policy areas.

With respect to e-commerce and innovation, we see wholesale already well positioned compared to other sectors of the economy, and do not think that further intervention is needed here. However, it may be worth thinking about measures to reduce the divide between Eastern European Member States and the rest of the European Union.

# 1. Introduction

High-income economies are all service economies. Service industries account for 74% of total employment in high-income OECD countries, according to data collected by the International Labour Organization (ILO 2015). Even in countries with large manufacturing sectors, such as Germany and Austria, the share of service industries is around 70% (Timmer et al. 2008). Only middle- and low-income countries have considerably lower service shares.

Within service industries, wholesale trade services take a prominent place. They employ one in twenty of all those working in the service industries (Timmer et al. 2008). Thus, in the EU-28 wholesale trade services employ about the same number of people as the transport sector or the hotels and restaurant sector.

The main economic function of wholesale trade is to bridge distance and time lags between production and final consumption of goods. This includes storage and the organisation of goods transport, but also the collection and provision of information to customers upstream and downstream in the value chain (Eurostat 2009). As distinct from retail trade, wholesaling activity only includes sales to retailers or to commercial and industrial users.

The first set of objectives of the present study is to gain an overview of the size and economic significance of wholesale trade in the EU. We therefore ask how the EU wholesale trade sector has developed since 2000 in terms of growth, sectoral composition, productivity, profitability and employment. Further aims of this study are to know more about the geographical structure of wholesale across Member States and regions, and the current strengths and weaknesses of wholesale trade in the European Union.

The second set of objectives of the study is to understand wholesale trade as an economic function, linking various sectors and countries in global value chains. Here, mainly two questions are asked. First, which are the upstream and downstream sectors in the European and global value chains and to what extent does vertical integration play a role in the chains identified? And second, where in the identified value chains are the main costs, revenues and value added generated?

A third objective of the study is to delve deeper into one wholesale sector, using a case study. For the sub-sector wholesale of mining, construction and civil engineering machinery, the study asks what characterises the sub-sector, at both the EU Member State and the EU-28 level, compared to the aggregate wholesale trade sector at those levels. It also asks what the European and global value chains look like in this particular sub-sector.

A further central question of the project has to do with the contribution of wholesale to market integration and efficiency. Wholesale trade may contribute to the integration of the single market by connecting producers, retail trade and industrial demand across European markets and bridging national markets;

however, there may also be barriers when some practices – such as parallel imports – are blocked by producers.

In the following, this report provides an overview of the wholesale sector in the EU-28 and at Member State level. We investigate in detail the economic structure of wholesale, including different actors in the EU wholesale markets. The wholesale function is carried out by wholesale firms, but also by the producers of goods themselves, by retail trade and, increasingly, by platforms on the internet.

We start with a brief overview of the literature and then illustrate the structural and geographical profile of the sector and trends in employment, value added, productivity and profitability. We also look at the sub-sectors of wholesale to learn more about the intra-sectoral heterogeneity of the industry. Moreover, the roles of foreign-owned firms in wholesale and the role of innovation and technology in the sector are analysed.

We further employ a cross-sectoral perspective to investigate the role of wholesale in different value chains. Here, the main focus is on the contribution of wholesale to final output in various value chains, and the emergence of this contribution over time.

The last task is a case study of wholesale of mining, construction and civil engineering machinery. This case study gives more insight into the large degree of heterogeneity between wholesale sub-sectors, by illustrating the specific conditions of this sub-sector and its strong ties to upstream and downstream industries.

## 2. The EU wholesale sector in perspective

### 2.1. LITERATURE SURVEY

Wholesale is the resale (sale without transformation) of new and used goods to retailers, industrial, commercial, institutional or professional users, or other wholesalers; alternatively, it may involve acting as an agent or broker trading (buying or selling) merchandise with such clients (Eurostat 2009; Oxford Institute of Retail Management 2014). Wholesalers frequently physically assemble, sort and grade goods in large lots, break bulk, repack and redistribute in smaller lots (for example, pharmaceuticals), store, refrigerate, deliver and install goods, and engage in sales promotion or label design for their customers.

The principal type of business included in wholesale involves merchant wholesalers – in other words, wholesalers who take title to the goods they sell, such as wholesale merchants or jobbers, industrial distributors, exporters, importers and cooperative buying associations; other types of business covered are sales branches and sales offices (but not retail stores) that are maintained by producers, apart from their production operations, for the purpose of marketing their products and that do not merely take orders to be fulfilled by direct shipments from the production operations. Also covered are merchandise and commodity brokers, commission merchants and agents and assemblers, buyers and cooperative associations engaged in the marketing of farm products.

To the best of our knowledge at the moment, there has been little analysis of the wholesale sector. We found the following streams of literature referring to the wholesale sector.

First, **sectoral portraits** present the economic structure of the wholesale sector on the basis of statistical indicators, such as business demographic variables (e.g. number of enterprises), input variables (e.g. labour inputs) and output variables (e.g. turnover, value added). They are based on data published by Eurostat on its website (<http://ec.europa.eu/eurostat>) and in various reports (e.g. Eurostat 2009); these data are generally collected from enterprises by national statistical institutes (NSIs).

Furthermore, some reports feature the **retail sector** more prominently in the title and/or text, but also cover wholesale aspects, as the distinction becomes easily blurred. Reasons for the increasing integration of wholesale and retail in such reports typically include the further diffusion of information technologies, the search for efficiencies through economies of scale and the need for differentiation (World Trade Organization 2010; Oxford Institute of Retail Management 2014).

In the literature, the term 'wholesale' is also used frequently in the context of deregulated **electricity markets**, which is actually not included in the sectoral definition of this study. In the move toward deregulation, nearly all economies concerned have correspondingly seen an increase in the variability of wholesale electricity prices. This has been the subject of many articles (Nakajima and Hamori 2013; Nyamdash and Denny 2013; Tashpulatov 2013; Cludius et al. 2014; Browne et al. 2015; Clò et al. 2015).

Another stream of literature that uses the term 'wholesale' aims at understanding the extent to which a **cost shock in the upstream supply of goods** is passed through to final consumer prices. Although this literature models the relationship between retailers and manufacturers along the vertical chain, and addresses the role of wholesale pricing frequently (Bonnet et al. 2009; Nakamura and Zerom 2010; Goldberg and Hellerstein 2013; Gaudin 2016), it is hampered by the fact that intermediate (=wholesale, resale) prices along the distribution chain and vertical contract terms between wholesalers and others are typically unavailable (Bonnet et al. 2009).

Other literature referring to wholesale comes from a **marketing perspective** and uses the term **B2B** (business to business). The term B2B covers wholesale, but captures other aspects as well. For example, knowledge-intensive business services (KIBS) are subsumed under the B2B stream of literature, but do not fall under wholesale. Others use the terms B2B and wholesale almost interchangeably.

One part of the B2B literature that is also relevant for wholesale has a strong inclination towards the topic of branding. Branding has long been associated with mainly business-to-consumer markets, but various changes in the business environment, such as the increasing homogeneity of product quality and the decreasing number of personal relationships due to digital communications, have also led to an increase in interest in B2B branding (Baumgarth 2010; Leek and Christodoulides 2011a, b; Glynn 2012; Leek and Christodoulides 2012).

Another part of the B2B literature relevant for wholesale seeks to provide an understanding of the adoption and routinisation processes of **e-commerce technologies** in different (wholesale) firms, and, based on this, in different (clusters of) countries. Differences in technology adoption are often attributed to technological maturity, firm size, absorptive capacity, competitive pressure and trading partner cooperation (Sila 2013; Oliveira and Dhillon 2015). This trend is strengthened by increased market transparency, which also intensifies competition. Innovative information aggregators (like RedLaser Barcode & QR Scanner or GoodGuide, used to find safe, healthy, green and ethical product reviews) facilitate comparison in the purchasing process. Others, like Panjiva proactively monitor supplier activity and make the information available, thus rendering it easier for retailers to connect directly with manufacturers.

The consequence is **disintermediation**, as retailers are able to go direct to manufacturers, and manufacturers are able to go direct to consumers. Greater transparency enables the deconstruction of the value chain and the entry of new competitors. The most likely result is reduced margins, as intermediaries are caught between product costs and competitors, where customers in weak markets are unwilling to accept price increases (Elms 2013).

Furthermore, the notion of the wholesale sector is challenged by the literature on **service-dominant logic** (Vargo and Lusch 2011), which also uses the B2B label. Wholesale, as a sector, is part of a traditional manufacturing approach, where a supplier produces and sells a good. It then remains the responsibility of the customer to make sure that it can make effective use of that good, so that value can be created out of the resource purchased (Gronroos 2011). In such a conceptualisation, wholesale can exercise the functions of warehousing and transportation of goods that are not included in the classification of wholesale provided in section 2.2 below. Instead, the service-dominant logic approach wants to transcend the 'goods' versus 'service' approach and argues that it is all about service in the end

(Vargo and Lusch 2011). Customers do not desire the goods for themselves, but for their service characteristics. And customers contribute resources in order to create value out of a good, which renders customers service integrators (Kohli 2011; Sheth 2011; Spohrer 2011; Vargo and Lusch 2011). A firm that has adopted a service-dominant logic would take much wider responsibility for a customer's everyday practices and for how it ultimately supports the customer's business (Gronroos 2011). In its furthest extension of the concept, this means the establishment of a service (eco) system, in which actors (note that this overcomes the distinction between suppliers and customers) co-produce service offerings, engage in mutual service provision, and co-create value (Vargo and Lusch 2011).

This stream of literature is in its infancy with respect to understanding and explaining the many types of service systems that exist, as well as how service systems interact and evolve to co-create value. Furthermore, the role of wholesale in such types of service systems has yet to be explored, as wholesalers in this view are part of a value network that goes far beyond their traditional, mainly distributive, functions. However, a trend towards the **vertical integration of supply chains** also seems to be the consequence of this.

## 2.2. ECONOMIC CLASSIFICATION OF WHOLESALE

This study uses the most recent classification of economic activities, NACE 2. The wholesale trade sector is covered by NACE Rev. 2 Division 46. This division includes wholesale trade for own account or on a fee or contract basis (commission trade) related to domestic wholesale trade, as well as international wholesale trade (import/export). The table below shows that NACE 46 includes eight NACE 3-digit sectors, which themselves include another 48 NACE 4-digit sub-sectors. A full list of all NACE 4-digit sub-sectors of NACE 46 is given in Table 6.

**Table 1 / Classification of wholesale trade at the NACE 3-digit level**

NACE	Sector	No. of 4-digit sub-sectors
46.1	Wholesale on a fee or contract basis	9
46.2	Wholesale of agricultural raw materials	4
46.3	Wholesale of food, beverages and tobacco	9
46.4	Wholesale of household goods	9
46.5	Wholesale of information and communication equipment	2
46.6	Wholesale of other machinery, equipment, supplies, etc.	7
46.7	Other specialised wholesale trade	7
46.9	Non-specialised wholesale trade	1

Source: Eurostat RAMON.

The classification of wholesale activities in the NACE has some remarkable characteristics. First, it follows the principle of classification according to the main product (food, household goods, etc.) with one exception – NACE 46.1, wholesale on a fee or contract basis. Activity in this sector is characterised by the way of doing business (for a third party), rather than by the main product. The sub-sectors of NACE 46.1 again follow the main product approach.

Second, another remarkable characteristic of this classification is that there are two NACE 3-digit sectors with quite similar names: other specialised wholesale trade and non-specialised wholesale trade.

The former includes many things that enterprises need as inputs for their activities – from oil, ores and metals, to construction materials and wood, but not including agricultural raw products, which constitute a separate wholesale sector. So a better name for this sector would be ‘intermediate industrial products’. The other unspecified category, non-specialised wholesale trade, includes everything that does not fit in any other category.

Third, the sectors have very different sizes, as can be seen in the following chapter. Wholesale of household goods includes virtually everything that consumers buy, except food – from clothing to household appliances, pharmaceuticals, books, furniture, etc. Wholesale of information and communication equipment, in contrast, is much more focused on one product group, while wholesale of other machinery, equipment and supplies again encompasses a wide range of investment products – from small tools to large mining equipment.

Fourth, in addition to NACE 46, there is also wholesale activity included in NACE 45, wholesale and retail trade and repair of motor vehicles and motorcycles. NACE 45.31 includes wholesale trade of motor vehicle parts and accessories, but not wholesale of motor vehicles themselves. A number of data sources, however, do not provide data at the 4-digit aggregation level, and so this sector is left out.

## 3. Structural profile of the sector

The aim of this third chapter is to investigate the relative size of wholesale, compared to other sectors of the economy, to look at the growth of wholesale over time and to study the distribution of wholesale activities across EU Member States and their regions. Moreover, the sub-sectors of wholesale are characterised by selected indicators like the number of firms, persons employed and value added.

### 3.1. RELATIVE SIZE AND OVERALL DEVELOPMENT OF WHOLESale

Wholesale is one of the largest segments in the business sector of the European Union in terms of employment. In 2013, wholesale employed about 10 million persons in the EU-28. Germany has the largest labour force in wholesale, with about 1.8 million persons employed. Germany, France, Italy and Spain together account for around half of all those employed in wholesale in the EU-28.

A good way of comprehending the size of wholesale trade is to compare it with retail trade and manufacturing (Table 2). There are roughly 3.6 million firms in retail trade, compared to 1.8 million in wholesale. However, wholesale generates more value added than retail trade, with considerably less employment. In other words, productivity in wholesale is higher than in retail trade; to some degree, this is also a result of employment structures.

**Table 2 / Comparison of wholesale trade (NACE 46) with retail trade (NACE 47) and manufacturing, EU-28, 2013**

NACE	Sector	No. of firms (million)	Persons employed (million)	Value added (billion EUR)
46	Wholesale trade, except motor vehicles	1.8	10.32	557
47	Retail trade	3.6	18.39	453
10-33	Manufacturing	2.1	29.55	1,597

Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

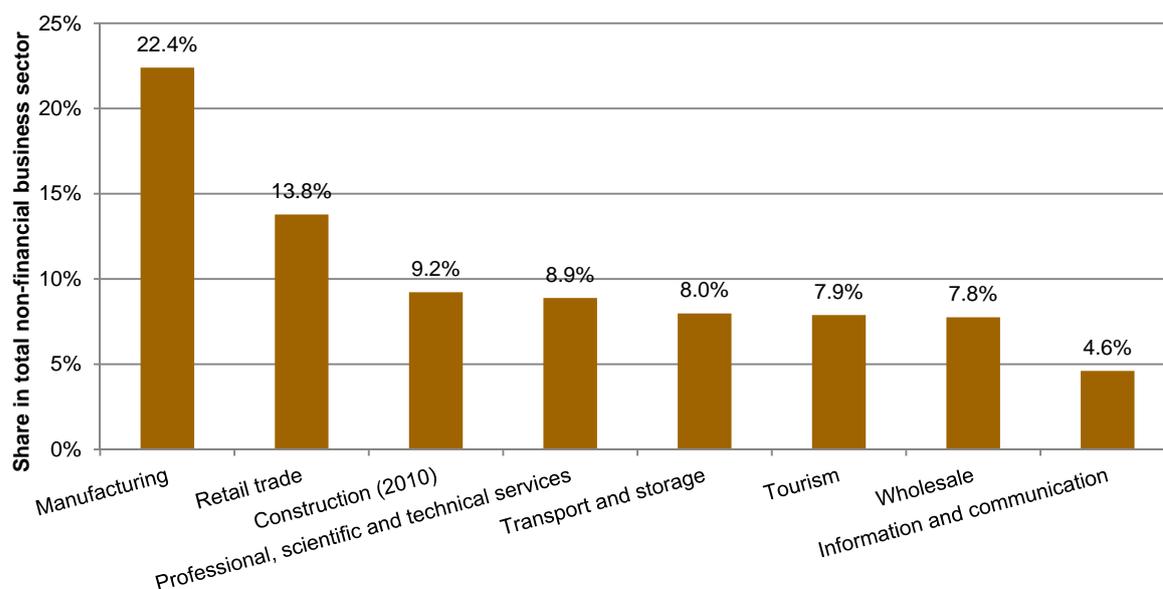
Retail trade is about 80% larger than wholesale in terms of employment, but wholesale is larger in terms of value added, and it also has more than twice the number of firms. We will see later that micro and small firms and self-employment have a high relevance in wholesale. The higher number of staff in retail trade is also related to the higher share of part-time employees in retail trade; this is less frequent in wholesale.

The value added of wholesale is only a third that of manufacturing, as is total employment. The difference between wholesale and manufacturing is considerably smaller in terms of the number of firms; we can therefore conclude that wholesale firms on average are considerably smaller than manufacturing firms, both in terms of value added and in terms of employment per firm. A comparison of labour productivity in wholesale, retail trade and manufacturing sub-sectors is provided in a later section of this report.

The wholesale sector is smaller than manufacturing; however, wholesale is still considerably larger than all manufacturing sub-sectors at the NACE 2-digit level. Wholesale is responsible for 7.8% of all those employed in the non-financial business sector of the EU-28. The largest manufacturing 2-digit sub-sector is the manufacture of food products (employment share: 3.07%), which accounts for less than half of the share of the wholesale sector in total employment. Manufacture of fabricated metal products – the next largest manufacturing sub-sector – accounts for 2.69% of total employment in the non-financial business sector of the EU-28. If we consider the relative size of a sector as a sign of its economic significance, we may say that wholesale has a higher significance than many sectors which are considerably more often in the media spotlight.

If we compare wholesale with other parts of the EU non-financial business sector, it turns out that wholesale is about the same size as the EU tourism industry and the transport industry, but is smaller than business services and the construction industry (Figure 1).

**Figure 1 / Number of persons employed in various sectors at NACE 1-digit level, EU-28, 2013**



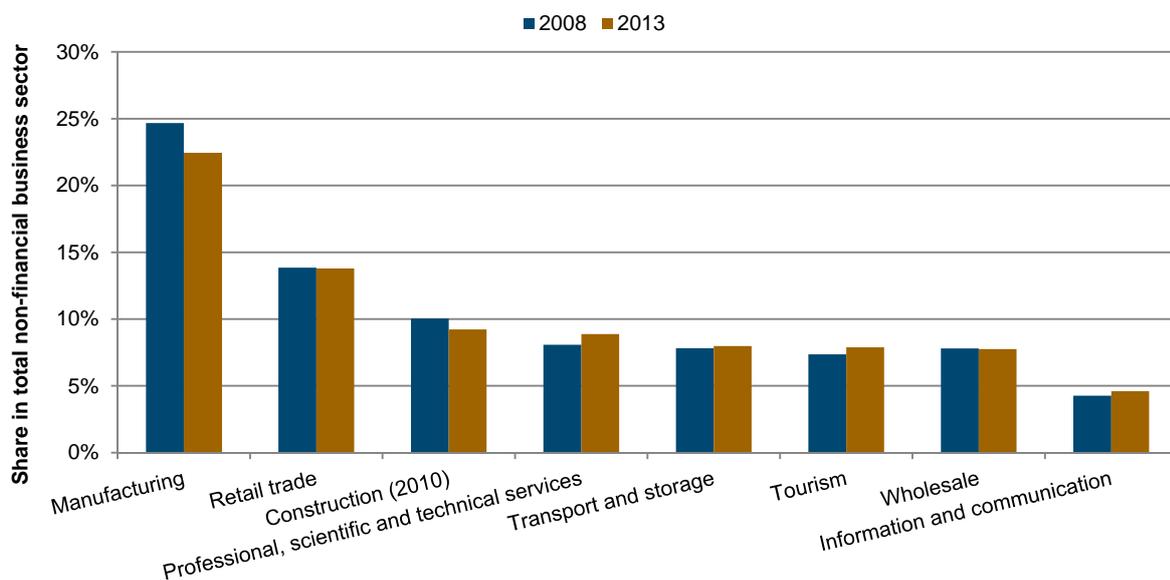
Source: Eurostat, Structural Business Statistics (sbs\_na\_sca\_r2 and sbs\_na\_1a\_se\_r2), own calculations.

Economic development after 2007 is dominated by the global financial crisis of 2008 and the stagnation in Europe in the aftermath of the sovereign debt crisis of 2010. Despite these events, employment in wholesale remained stable. In absolute terms, the number of persons employed (full-time and part-time employment) in wholesale in the EU-28 decreased only slightly from 10.367 million to 10.320 million between 2008 and 2013. In relative terms, however, wholesale had a lower share of total employment in the non-financial business sector in 2013 compared to 2008 (Figure 2).

Other sectors show more fluctuation, as can be seen in Figure 2. Manufacturing and construction have both lost employment share since the crisis: construction lost over a million persons employed between 2010 and 2013, while employment reductions in manufacturing amounted to more than 377,000 persons between 2008 and 2013.

The big winners in the development since 2008 in terms of employment have been the service sectors. The biggest gains since the crisis can be observed in professional, scientific and technical services, which also include business services. Here, 1.9 million new jobs have been created in the EU-28. Information and communication services have also raised their relative share, as well as their absolute share (by around 900,000 persons). Another sector with employment gains has been retail trade, which has created 1.39 million new jobs.

**Figure 2 / Development of various sectors at the level of NACE 1-digit, measured by persons employed, EU-28, 2008 and 2013**



Source: Eurostat, Structural Business Statistics (sbs\_na\_sca\_r2 and sbs\_na\_1a\_se\_r2), own calculations.

Finally, we take a long-term perspective on the growth of wholesale. There is no complete match between the data before and after 2008, due to changes in the statistical classifications. However, data from the EU-KLEMS database allows us to trace the development of employment in wholesale and other sectors for the EU-25 (without Bulgaria, Romania and Croatia) for the period 1995–2007. In the following graph, we contrast this growth with the development in 2008–2013.

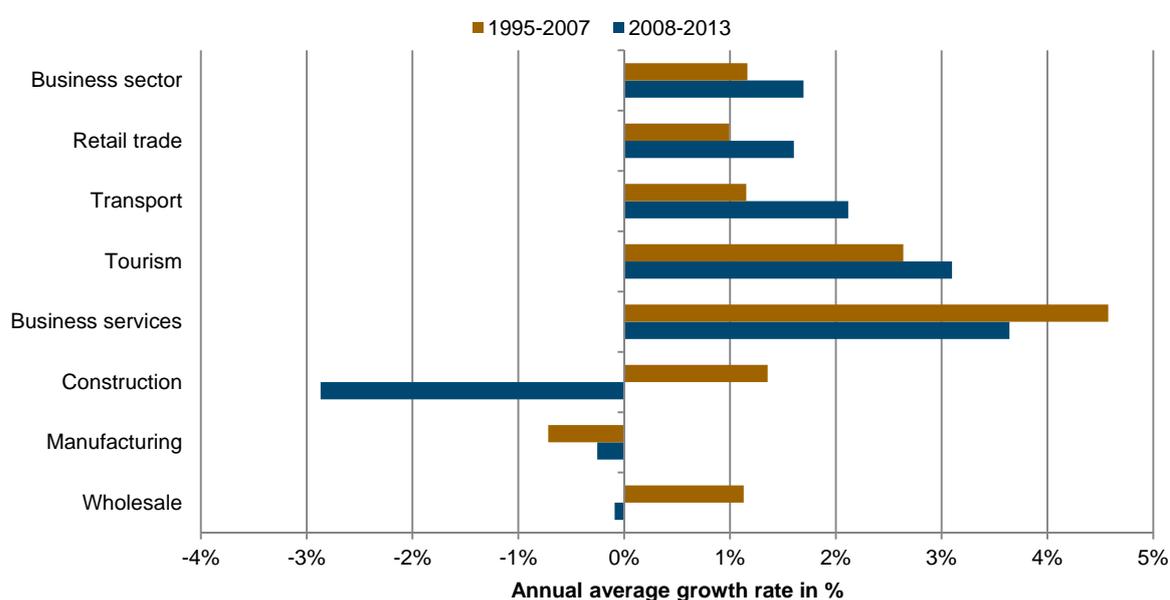
In this long-term perspective, employment in wholesale grew between 1995 and 2007 at an annual rate of 1.1%. This is about the same growth rate as in the whole non-financial business sector, and in construction and transport. Thus, the sector maintained a stable share of about 7% of total employment in non-financial business, or 4.4% of total employment. As we saw above, growth of wholesale slowed down to stagnate between 2008 and 2013.

Growth in wholesale, however, was considerably slower than in business services, which showed growth of 4.57% per annum. This growth rate makes business services one of the main contributors to new employment in the period 1995–2007 in the European Union. Business services could not maintain their high growth in the years after 2008; however, with average annual growth of 3.64%, they are still growing faster than all other sectors shown in Figure 3.

In sharp contrast to business services is manufacturing, which decreased by 0.7% annually between 1995 and 2007. As a consequence, the share of manufacturing in total business sector employment decreased from 32.1% to 29.4%. The decline in manufacturing employment has slowed since 2008, but nevertheless the sector is shrinking.

So, in the long run, wholesale is part of the growing employment in service industries, although it is not the fastest grower among these industries. Since 2008, growth in wholesale employment has stagnated.

**Figure 3 / Growth in the number of persons engaged in different sectors, 1995–2007 (EU-25) and 2008–2013 (EU-28)**



Source: Eurostat, Structural Business Statistics (sbs\_na\_sca\_r2 and sbs\_na\_1a\_se\_r2), EU-KLEMS, own calculations.

### 3.2. GEOGRAPHICAL PROFILE OF WHOLESALE

Which EU Member States have the highest specialisation in wholesale? The following figure (Figure 4) shows specialisation in terms of the share of wholesale in total employment of the non-financial business sector in 2013. Greece and Denmark stand out as the two countries with the highest specialisation, while Finland and the UK are at the other end of the distribution.

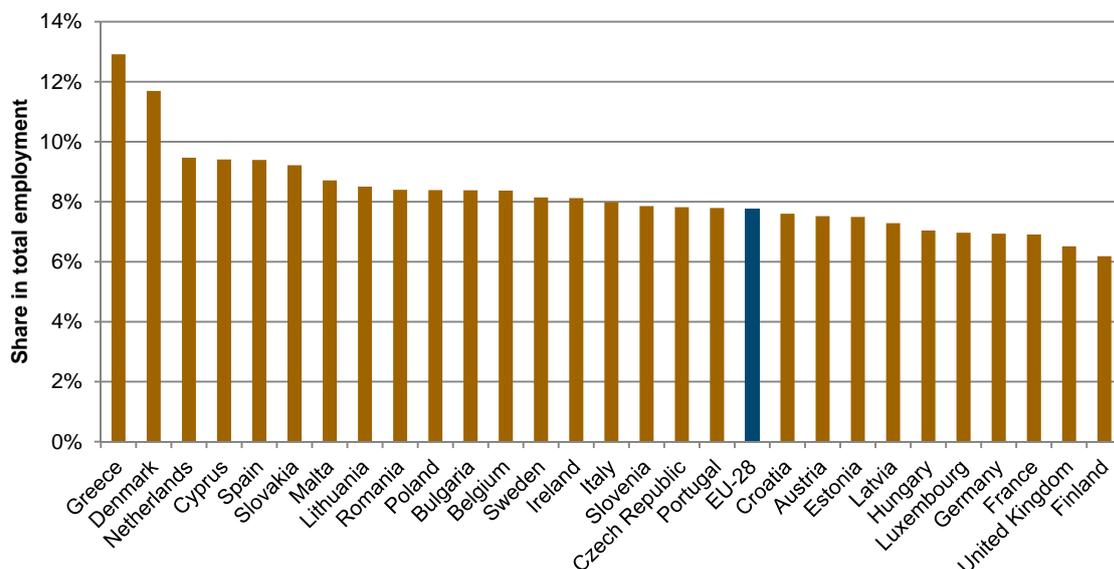
The high shares of Greece and Denmark may be related to the importance of another distributive service industry in these countries – transport. We show below that those regions where wholesale accounts for a high share of employment are mostly coastal regions. This could be, for example, because wholesalers in these regions also organise the import of goods into the EU. Moreover, there may also be a complementarity between sea transport and wholesale. Apart from Greece and Denmark, however, wholesale is quite evenly distributed across the EU, with a share of 7–9% in most Member States. This points to the fundamental distributive function of wholesale in modern economies.

Table 3 shows a list of selected indicators describing the wholesale trade sector (NACE 46) for the EU-28 countries, as well as Norway and Switzerland, for the year 2013 (see Table 27 in the Annex for more

indicators). This allows us to explore differences between the countries with respect to business demographic variables (e.g. number of enterprises), input variables (e.g. labour inputs) and output variables (e.g. turnover, value added).

With regard to number, Italy has the most enterprises in the wholesale trade sector (about 398,000 out of 1.8 million enterprises in the EU-28), followed by Spain (199,000) and France (about 168,000). This leaves Italy with twice as many enterprises in the sector being examined as the next-placed country.

**Figure 4 / Share of wholesale in total employment in the non-financial business sector, 2013**



Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

However, looking at the persons employed in this sector, Italy lies in only third place (with about 1,151,000 persons employed), after Germany and the United Kingdom (with more than 1,835,000 and 1,182,000 persons, respectively). In general, the average personnel costs are widely spread across the EU-28 countries, with a minimum of EUR 6,000 and a maximum of EUR 58,000 per person.

Average personnel costs are highest in Sweden (EUR 58,000 per person), Belgium (EUR 56,000) and Luxembourg (EUR 56,000) – at least among the EU-28 countries: Switzerland is unrivalled, exhibiting average personnel costs that are 1.7 times higher than those of Sweden. In contrast, the lowest values for average personnel costs are found in Bulgaria (EUR 6,000), Romania (EUR 7,000) and Latvia (EUR 10,000).

Besides being on top in terms of the number of persons employed, Germany also exhibits the highest turnover (EUR 1,154.1 billion) of the EU-28 countries, closely followed by the United Kingdom (EUR 1,148 billion) and France (EUR 825.1 billion). Switzerland, with a turnover of EUR 1,305.3 billion, outstrips all the EU-28 countries. Remarkably, Switzerland has comparatively few enterprises (11,200) or persons employed (206,700), which indicates a high turnover per firm or the dominance of a single firm with a comparatively high turnover. Comparing the value added across the countries, those ranked top are Germany (EUR 126.1 billion), France (EUR 78.6 billion) and the United Kingdom (EUR 55.2

billion). With the lowest value added being EUR 356 million (in Malta), the amounts are again spread widely. On average, the EU-28 countries show a value added of about EUR 19.9 billion, with half of the countries having a value of EUR 6.8 billion or more.

Looking at firm size, as measured by persons employed and value added per firm, Denmark and Germany are dominant on both indicators, with 12.2 and 12.4 persons employed per firm, and EUR 902,500 and EUR 852,600 value added per firm, respectively. Surprisingly, Ireland ranks second with respect to the value added per firm (EUR 871,300). Four countries exhibit a value added per firm of below EUR 100,000, namely Bulgaria, Croatia, Romania and Slovakia; with only EUR 54,400, the last mentioned lags far behind the others.

**Table 3 / Selected indicators – Wholesale trade (NACE 46), EU-28, 2013**

Country	Enterprises (1,000)	Persons employed (1,000)	Turnover (million EUR)	Value added (million EUR)	Firm size (persons employed)	Firm size (value added, EUR)	Average personnel cost (1,000 EUR p.p.)
BE	40	227	248,149	20,740	5.7	518,177	56
BG	27	156	34,990	2,398	5.9	90,415	6
CZ	86	273	86,238	6,995	3.2	81,741	14
DK	15	187	101,166	13,855	12.2	902,475	49
DE	148	1,835	1,154,055	126,081	12.4	852,630	42
EE	7	30	13,762	927	4.5	138,114	16
IE	10	89	62,124	8,776	8.8	871,326	47
EL	67	275	62,452	8,005	4.1	119,874	17
ES	199	994	360,571	44,072	5.0	221,217	29
FR	168	1,057	825,127	78,591	6.3	468,846	54
HR	16	76	14,136	1,585	4.6	96,629	12
IT	398	1,151	557,197	57,659	2.9	144,741	26
CY	4	20	5,067	708	5.0	181,814	24
LV	9	43	17,048	1,117	5.0	129,898	10
LT	9	74	18,035	1,801	8.0	194,441	11
LU	4	17	67,676	3,054	4.6	829,188	56
HU	33	169	44,398	4,331	5.1	130,903	13
MT	2	11	3,672	356	5.0	168,928	16
NL	87	506	438,217	45,617	5.8	527,119	47
AT	25	204	150,439	15,099	8.2	611,180	47
PL	114	688	197,143	16,338	6.0	143,174	11
PT	60	222	61,399	6,563	3.7	109,292	18
RO	52	322	54,438	5,003	6.2	96,873	7
SI	14	45	12,686	1,460	3.3	106,888	20
SK	48	129	26,852	2,608	2.7	54,352	11
FI	15	91	69,842	6,630	6.0	437,742	47
SE	46	247	155,580	20,690	5.3	445,831	58
UK	104	1,182	1,148,013	55,195	11.4	531,517	36

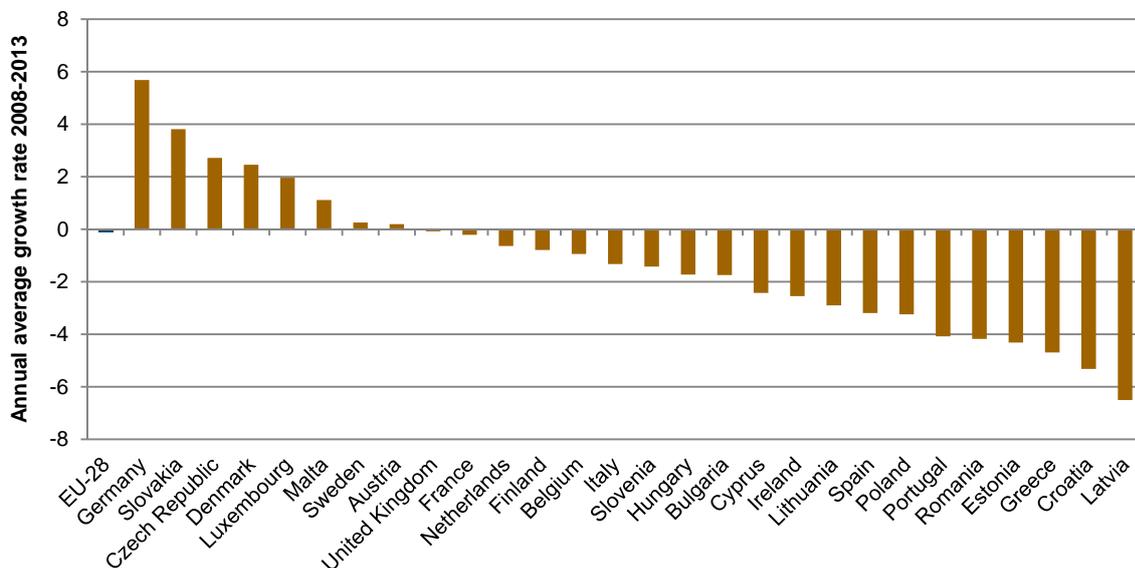
Notes: Ireland, values for 2012.

Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

As we have seen, employment in wholesale remained stable in the period 2008–2013. This is true for the EU as a whole, but not at the country level: in the majority of EU Member States – 20 out of 28 – we

see a decline in the number of persons employed in wholesale. These decreases were mostly compensated for by the development in Germany, where wholesale employment increased by 5.6% annually between 2008 and 2013, and increases in some smaller Member States. Germany's wholesale sector added 443,000 new jobs in this period. The largest decreases can be found in Southern European Member States and in Latvia. Northern and Western European countries performed better. The good performance of the Czech Republic, Slovakia and Austria – compared to Poland, Hungary and Finland – may be explained by the tight trade relations of these countries with Germany.

**Figure 5 / Average annual change in the number of persons employed in wholesale, EU-28, 2008–2013**



Notes: Ireland, values for 2012.

Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

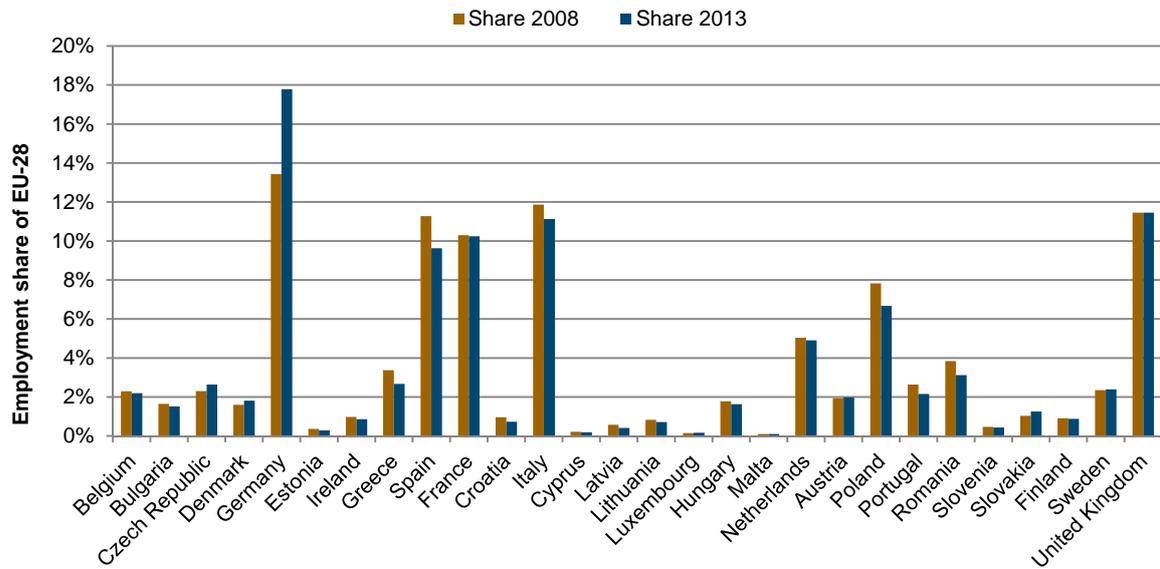
A consequence of these differences in growth performance was a change in the shares that individual Member States have on overall EU wholesale. We measure these changes in terms of employment. Most obvious is the change in the case of Germany, which increased its share by 4.4 percentage points. There are also gains larger than 0.1 percentage points on total EU wholesale for the Czech Republic, Slovakia and Denmark.

Spain, Poland, Italy, Greece and Romania suffered the biggest losses in terms of employment share. Together, these countries lost 5 percentage points on total EU-28 employment in wholesale. So, the period between 2008 and 2013, characterised by the global financial crisis of 2008 and the sovereign debt crisis of 2010 witnessed a considerable shift in economic activity in wholesale from the large Southern European Member States to Germany.

The ranking of growth performance at country level changes slightly when we look at value added instead of employment. Still, we find a decline in the majority of countries – 15 out of 28. Readers should note that the value added is in current prices, and so there are even more countries with negative growth performance when we consider real prices. Losses in value added are even larger than in employment

in some countries, including Greece and Croatia. The United Kingdom is a special case here, because the negative performance is due to one single sub-sector (see the analysis of sub-sectors below).

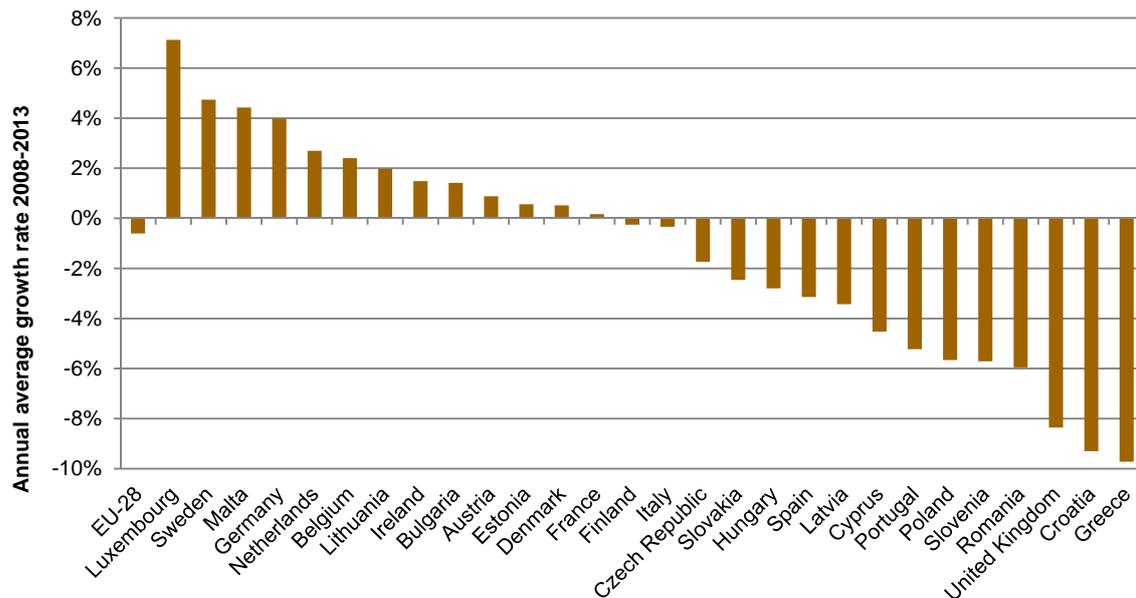
**Figure 6 / Share of EU Member States in total persons employed in wholesale in the EU-28, 2008–2013**



Notes: Ireland, values for 2012.

Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

**Figure 7 / Average annual change of value added in wholesale, EU-28, 2008–2013**



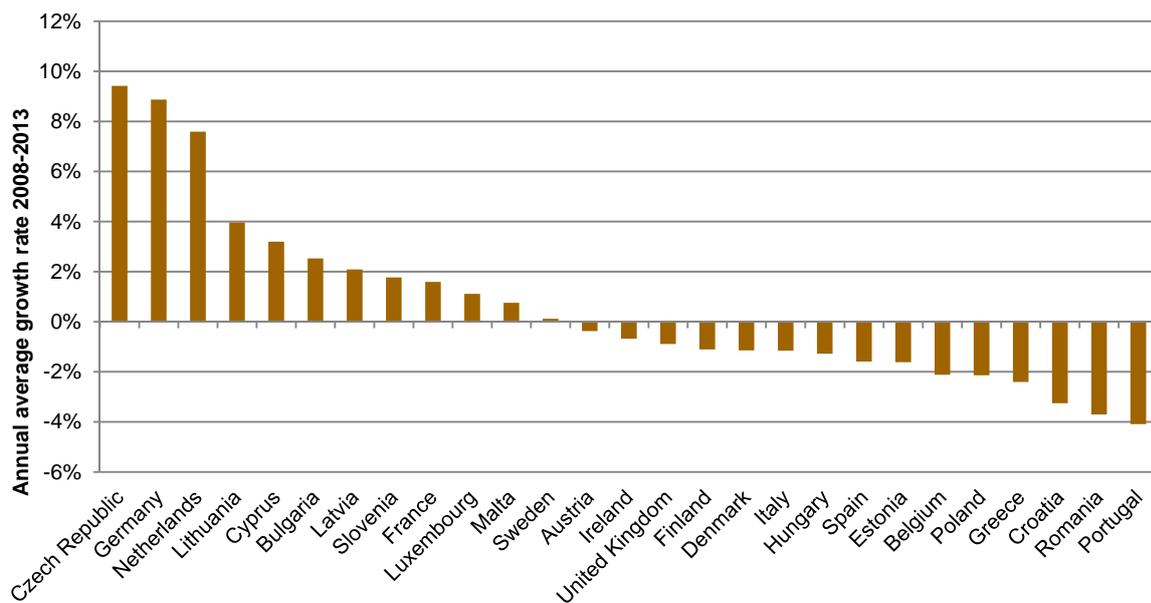
Notes: Ireland, values for 2012.

Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

Luxembourg and Malta, which also revealed positive employment growth, come to the fore in this ranking, together with Sweden. Germany is in fourth place in relative terms, but in first place in absolute growth: the German wholesale sector gained a total value added of around EUR 22 billion between 2008 and 2013, while wholesale at the EU-28 level lost a total value added of around EUR 17 billion.

If we compare the changes in value added and employment at the country level, it appears that the decrease in value added was larger than the losses in employment. The losses in employment and value added in the Southern European countries were accompanied by a reduction in the number of firms, as can be seen in Figure 8 below. These losses occurred roughly in the same countries as also suffered from lower employment and value added. Moreover, we learn from a comparison of the changes in the number of firms and employment that average firm size – as a result of less severe decreases in the number of firms than in employment – increased between 2008 and 2013 in most countries, with negative employment growth in Greece, Spain, Croatia, Italy, Romania and Poland. So the crisis also led to a restructuring of the wholesale sector in these countries.

**Figure 8 / Average annual change in the number of firms in wholesale, EU-28, 2008–2013**



Notes: Ireland, values for 2012; Slovakia has been excluded because the data showed an increase of 30% in the number of firms, which needs further inspection.

Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

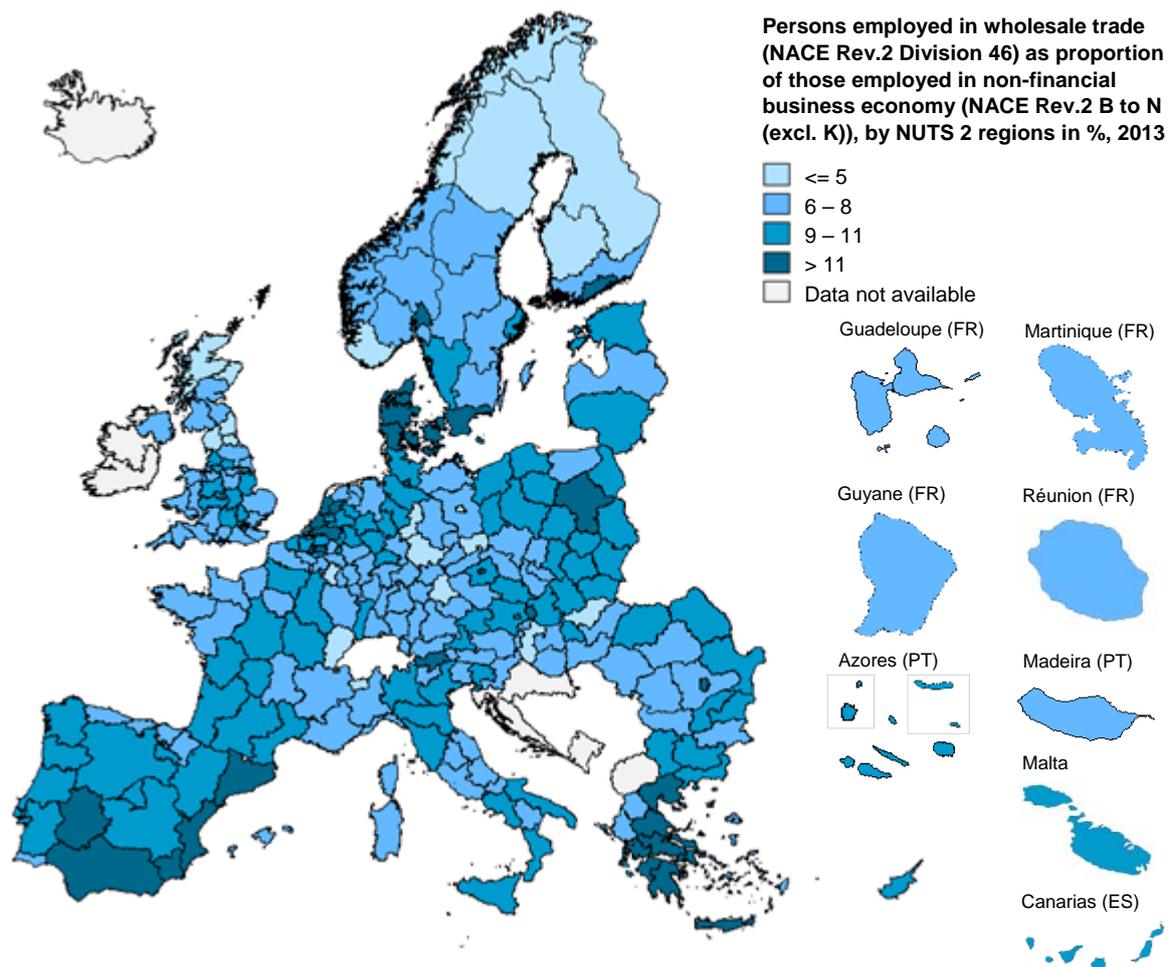
On the left side of the figure, we see countries that have enjoyed net growth in the number of wholesale firms, in particular the Czech Republic, Germany and the Netherlands. This largely resembles the development in value added and employment.

We now move on to the regional level. Figure 9 displays the regional employment specialisation and concentration in wholesale trade. Plotted are the shares of employment in wholesale trade (NACE 46) with respect to the non-financial business sector (B to N, excl. K) for 278 NUTS 2 regions. The overall mean of the employment share of wholesale at the regional level is 8.1%. Three out of four regions have a share less than 9.3%.

Regions with a high share of wholesale in employment are mostly coastal regions. Examples are the southern regions of Spain (e.g. Andalusia, Region of Murcia and Catalonia), large parts of Greece (e.g. Central Macedonia, Attica, Peloponnese), Denmark, southern Sweden, Belgium and the Netherlands. The highest shares are observable in Flevoland in the Netherlands (18.7%), the Greek regions of Central Macedonia (18.2%) and Attica (17.3%), the Region of Murcia (17.1%) in Spain, and in Belgium the region of Flemish Brabant (15.4%). This last region is the only one not located directly on the coast. We explain the preponderance of coastal regions by complementarities between wholesale and sea transport, and also by the location of importers near ports.

Regions with the lowest proportion of persons employed in wholesale trade are located in north-western Italy (Aosta Valley – 3.1%) and Belgium (the province of Luxembourg – 3.3%). A comparatively large number of regions with lower shares can be found in the United Kingdom (e.g. Inner London, North-Eastern Scotland) and Germany (e.g. Oberpfalz, Berlin, Braunschweig) – i.e. these regions are relatively unspecialised in the wholesale trade sector.

**Figure 9 / Persons employed in wholesale trade (NACE 46) as a proportion of those employed in the non-financial business economy by NUTS 2 regions in %, 2013**



Source: Eurostat, Structural Business Statistics (sbs\_r\_nuts06\_r2); Eurostat, Labour Force Survey (lfst\_r\_lfe2en2); own illustration.

To compare the regional spread of retail and wholesale trade, wholesale, and manufacturing activities across European regions, we calculated the standard deviation from the mean employment share at the regional level for manufacturing, wholesale and retail trade, and for wholesale. It turns out that employment in wholesale is much more evenly distributed than in total trade or in manufacturing; the standard deviation in wholesale is only 0.026, compared with 0.089 in the whole trade sector and 0.174 in manufacturing.

**Table 4 / Annual average growth of persons employed in wholesale trade at regional level, top 20 and bottom 20 EU regions, 2008–2013**

Top 20				Bottom 20			
Rank	Code	Name	Annual growth (in %)	Rank	Code	Name	Annual growth (in %)
1	FR63	Limousin <sup>1</sup>	17.0	247	UKC2	Northumberland and Tyne and Wear	-4.7
2	FR83	Corse <sup>1</sup>	11.4	248	RO12	Centru	-4.7
3	DE14	Tübingen	9.2	249	RO41	Sud-Vest Oltenia	-4.8
4	DE93	Lüneburg	9.1	250	UKD6	Cheshire	-4.8
5	DEC0	Saarland <sup>2</sup>	9.1	251	RO22	Sud-Est	-4.9
6	DE30	Berlin	7.9	252	PL42	Zachodniopomorskie	-4.9
7	DE24	Oberfranken	7.5	253	EL42	Notio Aigaio	-4.9
8	DEE0	Sachsen-Anhalt	7.5	254	ES70	Canarias	-5.0
9	DE13	Freiburg	7.3	255	EL52	Kentriki Makedonia	-5.2
10	DEA2	Köln	7.2	256	RO42	Vest	-5.3
11	UKD7	Merseyside	6.9	257	EL41	Voreio Aigaio	-5.5
12	DE12	Karlsruhe	6.9	258	PT17	Área Metropolitana de Lisboa	-5.5
13	DED2	Dresden	6.7	259	EL30	Attiki	-5.6
14	DE94	Weser-Ems	6.7	260	FR62	Midi-Pyrénées	-5.7
15	DEA3	Münster	6.7	261	EL54	Ipeiros	-5.7
16	DE73	Kassel	6.7	262	EL51	Anatoliki Makedonia, Thraki	-5.9
17	DE40	Brandenburg	6.5	263	ES12	Principado de Asturias	-6.5
18	DE21	Oberbayern	6.3	264	LV00	Latvija	-6.5
19	DEF0	Schleswig-Holstein	6.3	265	PT30	Região Autónoma da Madeira	-6.6
20	DE22	Niederbayern	6.3	266	PT15	Algarve	-6.6

1 Growth rate 2010–2013.

2 Growth rate 2008–2012.

Notes: Extra-regions of each country and regions with fewer than three observations are excluded, i.e. FRA1 (Guadeloupe), FRA2 (Martinique), FRA3 (Guyane), FRA4 (La Réunion). No data available for Croatia.

Source: Eurostat, Structural Business Statistics (sbs\_r\_nuts06\_r2); Eurostat, Labour Force Survey (lfst\_r\_lfe2en2), own calculations.

Growth at the regional level resembles growth patterns at the national level to a considerable degree: 17 of the 20 European regions with the highest annual average growth in wholesale are located in Germany. The remaining three regions in this ranking outside Germany are Limousin and Corse in France and Merseyside in the UK. Only three of the top 20 regions – Corse, Merseyside and Weser-Ems – are coastal regions, and so the higher specialisation of coastal regions we saw in the previous map was higher in 2008 than in 2013.

We find the largest decreases in wholesale employment at the regional level in Portugal (three regions in the bottom 20), Latvia (which forms one region) and Greece (six regions in the bottom 20). The only two regions in Western Europe in this list are Northumberland and Tyne and Wear and Cheshire, both located in the UK.

Altogether, a comparison of indicators at country level shows a very diverse picture of wholesale in the EU-28 countries. The wholesale trade sector within the EU is dominated by a few big countries that have large numbers of enterprises and persons employed, as well as high turnover and value added (namely Germany, the United Kingdom, Italy and France). Additionally, there are countries that show comparatively low numbers of enterprises and persons employed, but nevertheless have high value added and turnover, like Luxembourg, Denmark and Austria. A third group of countries have relatively high numbers of enterprises, but low turnover values and value added. These countries include Romania, Bulgaria and the Czech Republic.

The economic performance of wholesale in the period 2008–2013 was dominated by decreases in employment and value added in most EU Member States. The only notable exceptions to this are some smaller Northern and Middle European Member States and Germany. The growth of Germany's wholesale sector compensated for the losses in employment and value added in most other Member States that have led to stagnant employment and a moderate decrease in value added at the EU level.

Wholesale trade tends to have a higher share of total employment in coastal regions. However, these regions – mainly in Southern European Member States – were also among those most severely hit by the crisis.

### 3.3. SUB-SECTORS OF WHOLESAL

We now turn to the sub-sectors of wholesale. There are eight sub-sectors grouped by the main commodity traded, including two fairly wide sub-sectors of other specialised wholesale and non-specialised wholesale. The two largest sub-sectors at the EU level – wholesale of household goods (NACE 46.4) and other specialised wholesale (NACE 46.7) are also the two largest sectors in most EU Member States. These two account for 40–55% of total wholesale value added in most Member States.

Table 5 below gives an overview of these sub-sectors, including the number of enterprises, aggregate employment and the value added for 2013. Table 6 presents some structural indicators derived from the previous table.

NACE 46.4 – wholesale of household goods – is by far the largest sub-sector in terms of both employment and value added. This sector includes a wide range of consumer goods, from textiles, footwear and clothing to consumer electronics, pharmaceuticals, cosmetics, and household goods such as carpets, furniture, glassware and electrical appliances.

Another large sub-sector is NACE 46.7 – other specialised wholesale – which deals with intermediate products for industrial use, including oil, fuels and related products, metals and metal ores, wood, construction materials and sanitary equipment, and chemical products. A third large sub-sector is the wholesale of food and beverages, which includes all types of fresh and manufactured food, beverages, tobacco, sugar, tea and coffee, etc.

Another notable sub-sector is NACE 46.1, wholesale on a fee or contract basis. In this sub-sector, a large number of enterprises exist, but they account for only a low share of employment and value added, compared to other sub-sectors. This is also reflected by the low average firm size in NACE 46.1. We

may assume that the number of small firms and independent professionals is particularly high in this sub-sector.

**Table 5 / Wholesale trade (NACE 46) and sub-sectors: structural profile, EU-28, 2013**

NACE	Sector	Number of firms		Persons employed		Value added	
		total	% of total	Total, in 1,000	% of total	Total, m. EUR	% of total
46	Wholesale trade, except motor vehicles	1,805,236	100.0	10,320	100.0	557,231	100.0
46.1	W. on a fee or contract basis	583,523	32.3	1,018	9.9	44,001	7.9
46.2	W. of agricultural raw materials	64,973	3.6	342	3.3	17,000	3.1
46.3	W. of food, beverages and tobacco	211,023	11.7	1,786	17.3	85,236	15.3
46.4	W. of household goods	315,566	17.5	2,341	22.7	152,502	27.4
46.5	W. of info. and comm. equipment	61,256	3.4	586	5.7	49,000	8.8
46.6	W. of oth. machinery, etc.	170,648	9.5	1,335	12.9	84,660	15.2
46.7	Other specialised w. trade	276,890	15.3	2,248	21.8	98,685	17.7
46.9	Non-specialised w. trade	121,357	6.7	666	6.5	25,771	4.6

Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

**Table 6 / Structural indicators for wholesale trade (NACE 46) and sub-sectors, EU-28, 2013**

Sector	Firm size (no. of persons employed)	Firm size (value added)	Value added	
			by person employed	
46	Wholesale trade, except motor vehicles	5.72	308,675	53,994
46.1	W. on a fee or contract basis	1.74	75,406	43,240
46.2	W. of agricultural raw materials	5.26	261,647	49,766
46.3	W. of food, beverages and tobacco	8.46	403,917	47,722
46.4	W. of household goods	7.42	483,263	65,144
46.5	W. of info. and comm. equipment	9.56	799,922	83,689
46.6	W. of oth. machinery, etc.	7.82	496,111	63,406
46.7	Other specialised w. trade	8.12	356,406	43,907
46.9	Non-specialised w. trade	5.49	212,360	38,713

Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

We find the largest firms in terms of the number of employees and value added on average in NACE 46.5, wholesale of information and communication equipment. The analysis below reveals that the largest firms in this sub-sector are all affiliates of multinational firms in the field of information and communication technology, and that they act as the wholesalers for the products of their enterprise group. Firms in NACE 46.5 also reveal the highest productivity in terms of value added per employee.

We now move one level deeper into the structure of wholesale in Europe, with data at the NACE 4-digit level. Table 28 with the data can be found in the Annex.

The largest 4-digit sub-sector is wholesale of wood, construction materials and sanitary equipment, which employs 865,000 persons, and the wholesale of pharmaceutical goods (with 617,000 persons employed). The two smallest sectors are wholesale of hides, skins and leather (3,986 persons), and wholesale of machinery for the textile industry and of sewing and knitting machines (2,400 persons).

We find roughly a third of all firms in wholesale on a fee and contract basis. Most of them are in the unspecified groups agents specialised in the sale of other particular products and agents involved in the

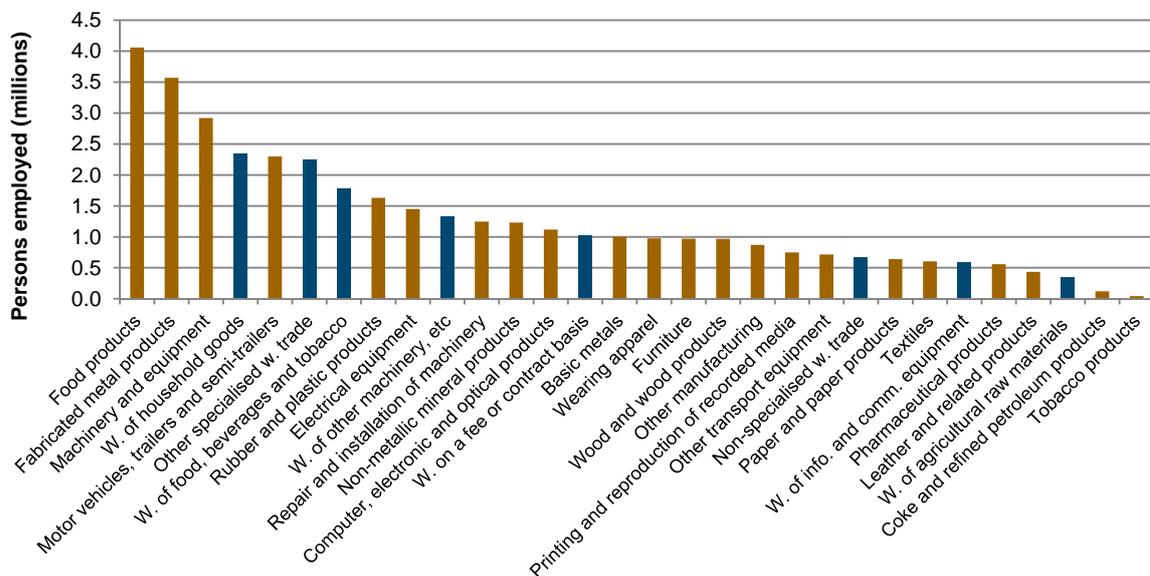
sale of a variety of goods. Together, these two sub-sectors account for half a million employed. Another sector with a large number of firms is wholesale of household goods.

The largest value added is created at the 4-digit level in wholesale of other machinery and equipment, followed by wholesale of pharmaceutical goods and wholesale of wood, construction materials and sanitary equipment.

At the 4-digit level, the largest value added by persons employed can be found in the wholesale of tobacco products, followed by wholesale of information and communication equipment and wholesale of pharmaceutical products. The wholesale of tobacco products and the wholesale of pharmaceutical products are also the two sectors with the highest number of persons employed per firm. These are, then, on average the largest firms in wholesale.

How does the size of wholesale sub-sectors compare with manufacturing? The following figure presents this comparison at the NACE 2-digit level for manufacturing and at the NACE 3-digit level for wholesale. The figure presents some interesting pairings that provide a better understanding of the relative size of the manufacturing and wholesale sectors. Wholesale of household goods and other specialised wholesale trade, for example, employ roughly the same number of persons as the EU automotive industry; the same is true for the wholesale of machinery and the electrical equipment industry.

**Figure 10 / Comparison of the number of persons employed in manufacturing and wholesale sub-sectors, EU-28, 2013**



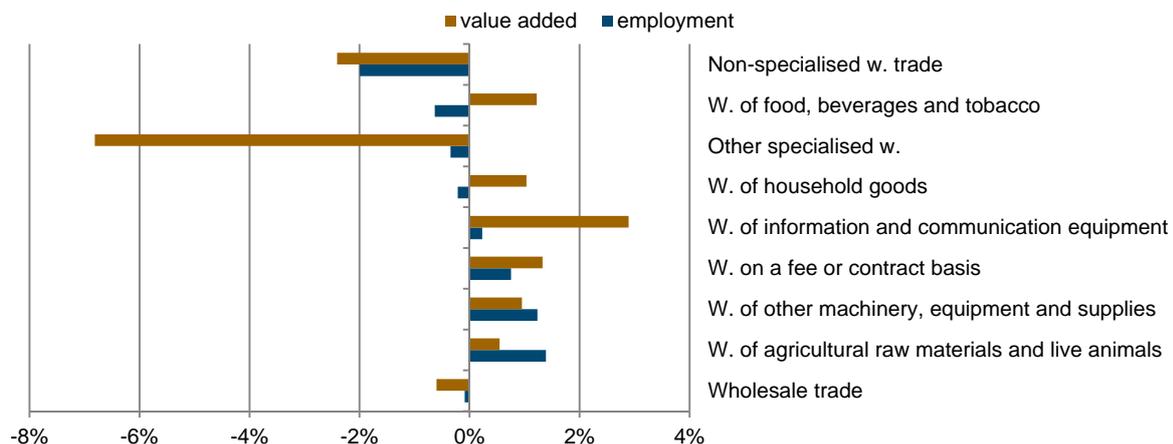
Source: Eurostat, Structural Business Statistics (sbs\_na\_ind\_r2, sbs\_na\_dt\_r2), own calculations.

We can also compare sectors that trade in similar products: wholesale of food beverages and tobacco, and wholesale of agricultural raw materials are about half the size of the EU food industry. We find roughly the same proportion between manufacturing of machinery and wholesale of machinery, and between the EU computer and electronics industry and wholesale with information and communication equipment.

The size of wholesale and its sub-sectors has changed only little in recent years. The following figure 11 shows the compound annual growth rate of value added and employment in wholesale sub-sectors. Employment in wholesale stagnated between 2008 and 2013, with an average annual growth rate of -0.09% and an average annual growth in value added of -0.6%. Value added decreased slightly faster than employment, which indicates that productivity decreased.

It appears that six of the eight sub-sectors had a higher value added in 2013 than in 2008. Value added of the whole sector remains below the level of 2008. This is mainly due to the dismal development of non-specialised wholesale trade and other specialised wholesale trade, which even revealed a negative value added in some Member States. Wholesale with information and communication equipment showed the best performance.

**Figure 11 / Average annual growth rate of value added and the number of persons employed in wholesale sub-sectors, EU-28, 2008–2013**



Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

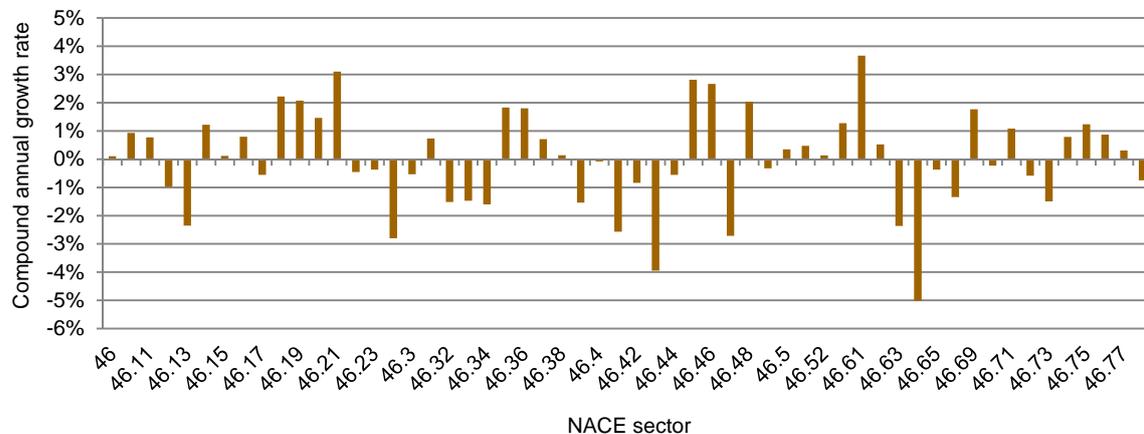
In half of the sub-sectors, employment was higher in 2013 than in 2008. The best employment performance could be found in wholesale with agricultural materials, while non-specialised wholesale showed the worst performance. Thus, we can relate the stagnation of employment in wholesale to non-specialised wholesale trade, which lost 70,000 persons employed in the period from 2008 to 2013. Another 57,000 persons employed were lost in wholesale of food, beverages and tobacco.

The figure also holds important information on productivity growth in wholesale. A higher growth rate for value added than for employment over the period 2008–2013 would indicate a positive productivity trend. This is the case in four of the eight sub-sectors, most notably in wholesale of information and communication equipment. Thus, only half of the sub-sectors have a positive productivity trend between 2008 and 2013. We will return to productivity later in this chapter.

Data on wholesale allows us to delve deeper into the economic structure of the sector at the NACE 4-digit level. Here, we see that the growth in NACE 46.2, wholesale of agricultural raw materials, can be attributed to the wholesale of grain, while other sub-sectors of NACE 46.2 had negative growth between 2008 and 2013. Another sector which increased its size considerably between 2008 and 2013 is NACE 46.61, wholesale of agricultural machinery.

We also see some growth in wholesale on a fee or contract basis, where a lot of very small firms are active (the average firm in this sector employs 1.7 persons, including self-employed). This rise may be a consequence of the economic crisis, which pushed people from other sectors into freelance wholesale activity. Growth in NACE 46.1 is strong in the general categories of NACE 46.18, agents specialised in the sale of other particular products, and NACE 46.19, agents involved in the sale of a variety of goods. Another example is NACE 46.16, agents involved in the sale of textiles, clothing, fur, footwear and leather products, which increases on average by 0.8%, while the wholesale of textiles (NACE 46.41) and wholesale of clothing (NACE 46.42) declined on average by 2.5% and 0.7% annually.

**Figure 12 / Average annual growth rate of the number of persons employed in wholesale NACE 4-digit sectors, EU-28, 2008–2013**



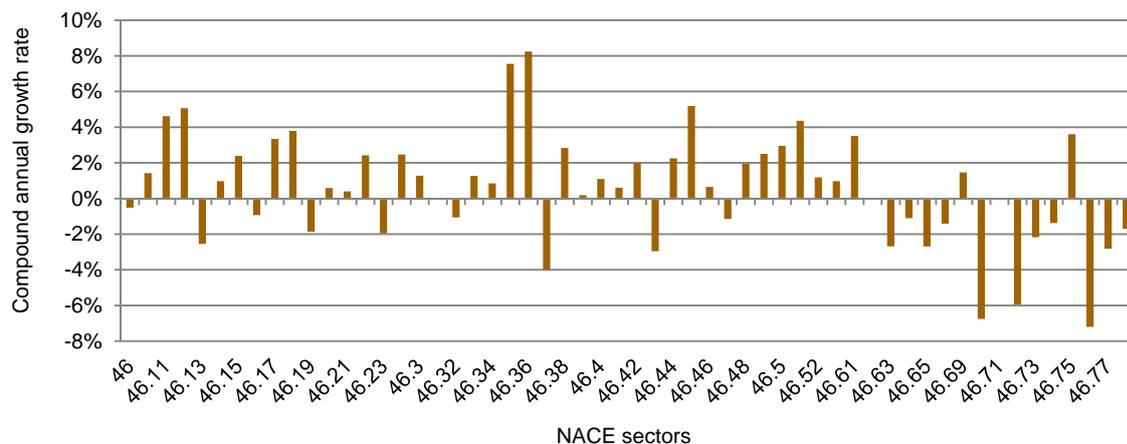
Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

We find the largest decreases in employment at the NACE 4-digit level in NACE 46.64, wholesale of machinery for the textile industry and in NACE 46.43, wholesale of electrical household appliances. The fall in employment in NACE 46.64 can be attributed to the decline in its main clients in the European textiles and apparel industry: between 2008 and 2013 it lost on average 5–6% of the workforce. The losses of employment in wholesale of electrical household appliances may be attributed to new competition from e-commerce; this would also explain the employment reductions in wholesale of textiles and in the wholesale of apparel. These goods are among those where online purchases are high (PricewaterhouseCoopers 2016). However, online sales are also high for perfumes and cosmetics (NACE 46.45) and pharmaceuticals (NACE 46.46), and in these wholesale segments we see no decrease in employment.

Changes in value added at the disaggregated level of NACE 4-digit sectors are even larger than changes in employment. We see the largest decline in value added over the period 2008–2013 in the sub-sectors of NACE 46.7, other specialised wholesale. These sub-sectors include the wholesale of intermediate products for industrial use, including oil, fuels and related products (NACE 46.71), metals and metal ores (NACE 46.72), wood, construction materials and sanitary equipment (NACE 46.73), hardware, plumbing and heating equipment and supplies (NACE 46.74) and wholesale of chemical products (NACE 46.75).

The only sub-sector with a growth in value added in the period 2008–2013 was NACE 46.75, wholesale of chemicals. Value added in NACE 46.72 and 46.76 dropped by about 6% per annum, which equates to a total decrease in value added of about 30% during the whole period. Value added in NACE 46.71, wholesale of fuels and related products, even turned negative in 2013 for the EU-28, and so we removed this sub-sector from the figure.

**Figure 13 / Average annual growth rate of value added at factor cost in wholesale NACE 4-digit sectors, EU-28, 2008–2013**



Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

The explanation for this weak performance lies, on the one hand, in the decreased demand of manufacturing firms for raw materials. On the other hand, prices were quite volatile during this period, with a general tendency towards lower prices for industrial raw materials, including oil. This had direct effects on value added: if a firm buys at a higher price than it sells, value added turns negative. A negative value added for NACE 46.7 indeed appears for the UK in the 2013. We checked with Eurostat and they confirmed that the value is correct.

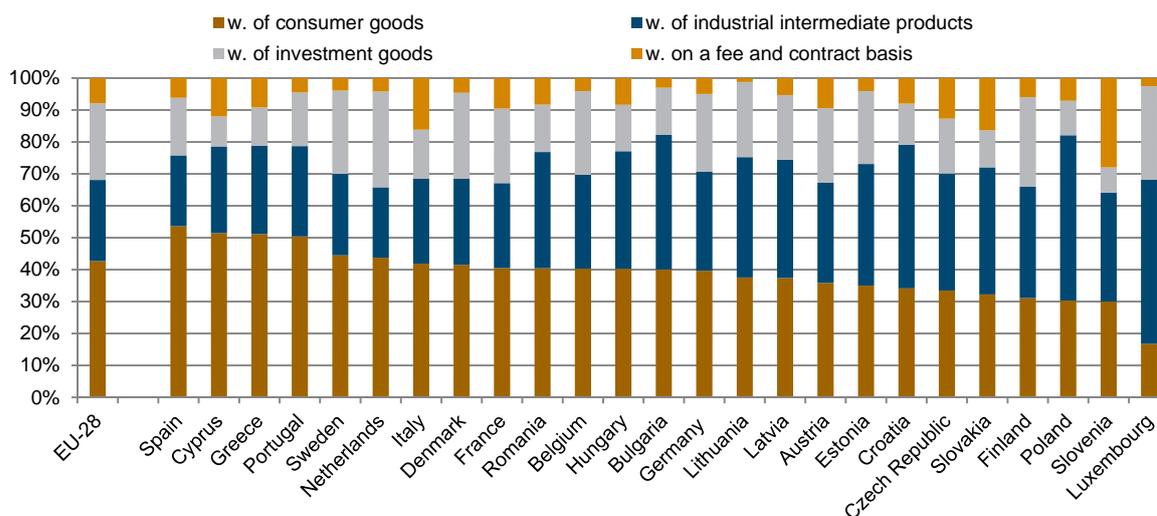
But there were also winners in the period 2008–2013. Wholesale of tobacco products and wholesale of sugar and chocolate and sugar confectionery showed annual growth rates of about 8% during that period. Since the neighbouring sector NACE 46.47 (wholesale of coffee, tea, cocoa and spices) shows a decrease of 4% annually, this may at least partly be due to a statistical reclassification during the period. The wholesale of tobacco products may benefit from the inelastic demand for these products, which makes price increases easier than in other sectors.

Finally, we aggregated the wholesale sub-sectors according to the type of goods traded (see Figure 14 below). We distinguish between consumer-oriented wholesale activities (food, beverages, household goods), industrial intermediate goods (agricultural raw materials, oil, metals, ores, construction material, etc.) and investment goods (machinery including information and communication equipment). Countries are sorted in the figure according to their share of consumer-oriented wholesale activities.

Consumer-oriented wholesale activities account for the bulk of value added in Spain, Greece, Portugal and Cyprus, while the more business-oriented intermediate goods and investment goods wholesale is stronger in Luxembourg, Finland, Poland, Slovakia and the Czech Republic. Luxembourg stands out for

having a share of other specialised wholesale that reaches 50% of total wholesale value added. So wholesale sub-sectors are not evenly distributed across EU Member States. We have to consider, however, that the value added shares of different sub-sectors are also influenced by the degree of vertical integration in each country. If firms perform wholesale activities in house and not via external wholesalers, the share will be lower.

**Figure 14 / Share of sub-sectors in different European countries as a percentage of total wholesale value added, 2013**



Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

### 3.4. SUMMARY

In this section we have provided evidence of the economic significance of wholesale in European economies, but also of the huge heterogeneity in wholesale between countries and sub-sectors.

Wholesale employs about 10 million persons in the EU-28 and accounts for 7–9% of total employment in most Member States. So, wholesale is smaller than manufacturing and retail trade, and about the same size as tourism. Some sub-sectors of wholesale are quite large: wholesale of household goods and other specialised wholesale trade, for example, employs roughly the same number of persons as the EU automotive industry. Compared to the total economy, Greece and Denmark stand out as having a particularly large wholesale sector as a share of total employment. At the regional level, we see a greater than average size of wholesale activities in coastal regions.

Employment in the sector remained stable between 2008 and 2013. At the country level, we see that this is the result of considerable decreases in wholesale employment in Southern European Member States; these declines were compensated for by the growth of Germany and, to a lesser extent, some other smaller EU Member States. As a consequence, firms located in Germany have gained importance in European wholesale over the observation period. At the sub-sector level, wholesale of information and communication equipment, wholesale of agricultural raw products and wholesale of machinery show the best growth performance, while wholesale activities in industrial raw materials are shrinking.

## 4. Firm size in wholesale

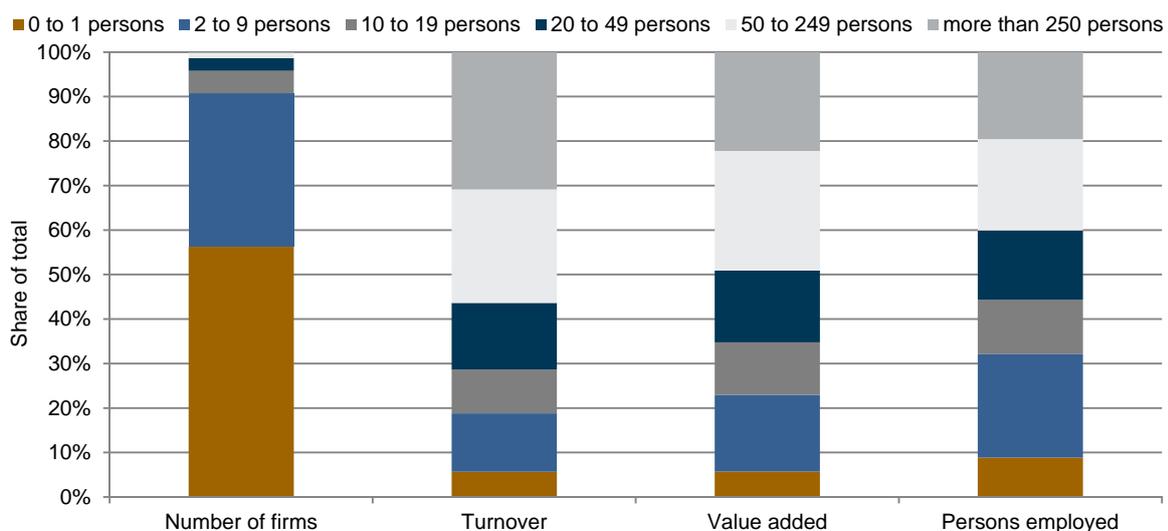
The fourth chapter is dedicated to firm size distributions with regards to turnover, value added, persons employed and number of firms on both an aggregated and a sub-sector level. Additional insight is given by a comparison of wholesale, retail and manufacturing. Furthermore, the role of large and dominant firms in European wholesale is also analysed from the point of view of concentration.

Firm size is one of the most decisive variables in the study of individual industries. Large firms enjoy advantages in many industries, such as the advantage of greater purchasing and price-setting power, or economies of scale. Thus, regulation at the national and EU level tries to avoid the negative effects of firm size via control of mergers and acquisitions. Small firms, in contrast, enjoy a higher degree of flexibility and often do better in adjusting to the special needs of their clients. This gives them certain advantages when it comes to specialisation and the exploitation of market niches which are too small for large firms.

### 4.1. FIRM SIZE DISTRIBUTIONS

The following figure (Figure 15) provides a first snapshot of the role of small and large firms in wholesale. It shows the share of different size classes in terms of the number of firms, turnover, value added and persons employed in wholesale.

**Figure 15 / Share of different size classes in terms of the number of firms, turnover, value added and persons employed in wholesale, EU-28, 2013**



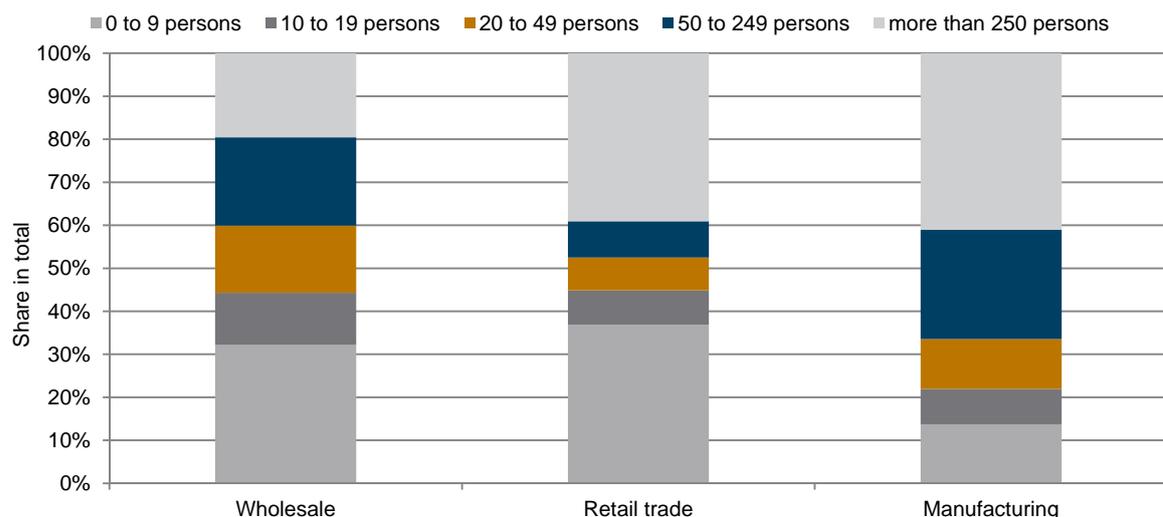
Source: Eurostat, Structural Business Statistics (sbs\_sc\_dt\_r2), own calculations.

We see that the distribution of firms over the size categories is skewed: over half of the firms in wholesale are very small – up to one person employed, besides the owner. Only 1.4% of all wholesale

firms have 50 or more persons employed, and only 0.2% of all firms have more than 250 persons employed. However, firms with 50 or more persons employed account for more than half of total turnover and value added, and for around 40% of all persons employed in the sector. Concentration in terms of the share of the largest firms is highest in turnover, where 30% of all sales are by firms with 250 and more persons employed this is followed by value added, with a share of 22% of the largest firms.

How does this distribution in wholesale compare to other sectors? The following figure (Figure 16) compares the shares of different size categories in terms of the number of persons employed in wholesale, retail trade and manufacturing. We see that wholesale trade and retail trade are similar in some respect, for example in the importance of very small firms with up to 9 persons employed. This size category accounts for around a third of total employment in wholesale and retail, but for only 14% of employment in manufacturing. One explanation is the presence of minimum efficient scales in manufacturing, due to high sunk costs for initial investments, which are not present in trade.

**Figure 16 / Share of different size classes in terms of the number of persons employed in wholesale, retail trade and manufacturing, EU-27, 2013**



Note: No data for Ireland available.

Source: Eurostat, Structural Business Statistics, own calculations.

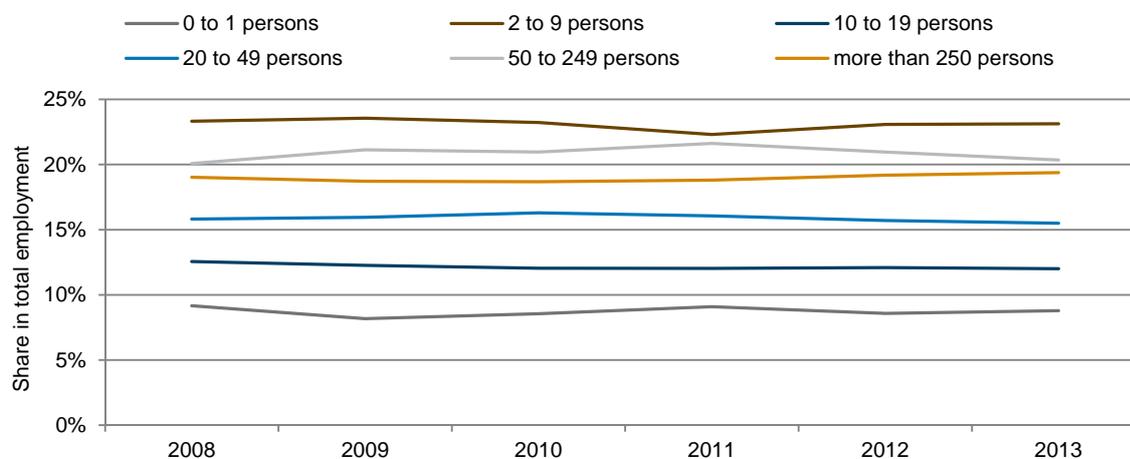
However, there are also noticeable differences between retail and wholesale trade in terms of size distribution. The middle segment of firms – between 20 and 249 persons employed – accounts for 36% of employment in wholesale, but for only 16% in retail trade. In other words, employment in retail is mostly found either in large or in small firms, while medium-sized firms are squeezed out in retail because they enjoy neither the market power and organisation of large, multi-outlet retail chains nor the degree of specialisation of small niche retailers nor the locational advantages of corner shops.

If we look at large firms with 250 or more persons employed, the data reveal a much lower employment share for them in wholesale than in retail or manufacturing. This indicates that size advantages such as economies of scale are less relevant in wholesale than in the other two sectors.

The relative lack of large firms may also be related to foreign ownership. In wholesale, foreign-owned firms are considerably smaller on average than in retail and manufacturing (however, on average foreign-owned firms are larger than their domestically owned competitors). For the EU-28, we calculate an average firm size for foreign-owned firms of 168 persons employed in manufacturing and 187 persons employed in retail, but only 33 persons employed in wholesale. This is based on data from Eurostat's database on foreign affiliates (FATS) for the EU-28, minus Cyprus, Ireland, Luxembourg and Malta. The smaller size of foreign-owned firms may be a result of the strategy chosen by multinational firms to serve national markets in the EU via national wholesale firms that operate as representatives of the products of the parent company in the country. The limitation of dealing in the products just of the parent company clearly restricts the size of these affiliates. A more thorough analysis of the role of foreign ownership in European wholesale is given below.

The employment shares of different size categories were quite stable in the period 2008–2013, as can be seen from Figure 17. The largest movement can be observed among firms of between 50 and 249 employees, which increased their share by 1.5 percentage points between 2008 and 2011, but lost share again between 2011 and 2013.

**Figure 17 / Share of different size categories in terms of the number of persons employed in wholesale, EU-28, 2008–2013**



Source: Eurostat, Structural Business Statistics (sbs\_sc\_dt\_r2), own calculations.

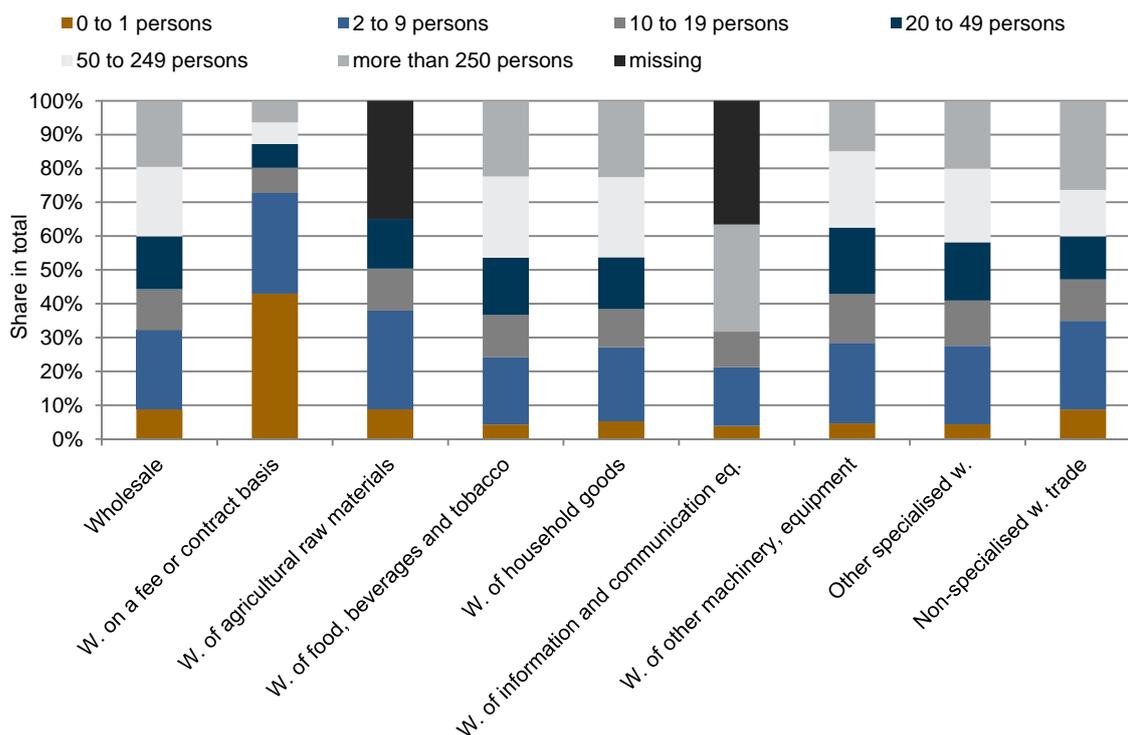
This is a remarkable result, because there are some potential drivers of structural change in the sector that would lead to a significant higher or lower share of different size categories: the productivity effects of new information technologies could favour large firms, leading to mergers and acquisitions; greater openness to international trade and stronger integration of the single market could also lead to larger firms; on the other hand, a large number of market entries by individuals who are forced into self-employment by higher unemployment in the European Union may drive up the share of micro and small enterprises. Nothing is visible from the data. However, we cannot rule out the possibility that this occurred before 2008, since consistent data are only available from that date.

We now turn to firm size differences within the wholesale sector. The figure below presents the distribution of persons employed across size categories for wholesale trade and its sub-sectors. Some

data are also missing due to confidentiality – for example, for medium and large firms in wholesale of agricultural raw products and of information and communication equipment.

The data reveals a considerable degree of consistency between the various sub-sectors. In wholesale, the share of persons working in small firms with fewer than 10 persons employed is 32%; another 28% work for firms with between 10 and 49 persons employed, and around 40% work for medium-sized and large firms with 50 or more persons employed. The most noticeable deviation from this distribution is wholesale on a fee and contract basis – a sector that deviates from the usual classification according to the main product traded. This sector is rather an aggregation of all wholesale activity for third parties on a fee and contract basis, regardless of the product. Here, micro and small firms are much more important than in other parts of wholesale, accounting for more than 70% of all persons employed and 99% of all firms, but for only 60% of total value added in the sub-sector. Around half of those working in micro-enterprises with up to one person employed are found in this sub-sector.

**Figure 18 / Share of different size classes in terms of the number of persons employed in wholesale and sub-sectors, EU-27, 2013**



Note: Some data are missing due to confidentiality.

Source: Eurostat, Structural Business Statistics (sbs\_sc\_dt\_r2), own calculations.

The size distribution in wholesale of information and communication equipment and other wholesale, in contrast, is more biased towards medium-sized and large firms. The employment share of firms with 250 persons or more is 32%, compared to only 19% in the overall sector. Accordingly, the share of micro and small firms is noticeably lower. The same is true of wholesale of food, beverages and tobacco: medium-sized and large firms account for 46% of all persons employed in this sub-sector, compared to a sectoral average of 40%.

So, the greater importance of micro and small firms in wholesale is to a considerable degree a result of one single sub-sector: wholesale on a fee and contract basis. Without this sub-sector, the share of these firms in terms of total employment would be about 5 percentage points lower. It seems that wholesale on a fee and contract basis offers considerable opportunities for entrepreneurs and self-employed, which are related to the type of business conducted, rather than to the main product. However, even without wholesale on a fee and contract basis, the employment share of large firms with 250 or more persons is still 20 percentage points lower than in retail trade and manufacturing.

The table below gives the average firm sizes in wholesale and each sub-sector, and the average sizes of firms with up to 1 employee, 2–9, 10–19, 20–49, 50–249 and more than 250 persons employed. More detailed information on average firm size in different sub-sectors at the country level can be found in Table 27 in the Annex.

Apart from the large number of very small firms in wholesale on a fee or contract basis, which results in a smaller firm size in this sub-sector in the size class 2–9 persons employed, the distribution of firm size across different size categories is quite even. So firm size is one factor where heterogeneity between different sub-sectors is of only minor importance – with the exception of wholesale on a fee or contract basis.

Moreover, this result means that the differences in firm size we observed between countries are rather a result of country-specific factors other than different average firm size of wholesale sub-sectors – for example, national regulation, entrepreneurship, access to finance, etc.

**Table 7 / Average firm size in wholesale trade (NACE 46) and sub-sectors, EU-28, 2013**

NACE	Sector	Firm size (no. of persons employed)						
		Total	0–1	2–9	10–19	20–49	50–249	+ 250
46	Wholesale trade, except motor vehicles	5.7	0.9	3.8	13.6	30.9	97.8	661.2
46.1	W. on a fee or contract basis	1.7	0.9	3.1	13.4	31.5	101.3	606.5
46.2	W. of agricultural raw materials	5.3	0.9	3.7	13.1	-	-	-
46.3	W. of food, beverages and tobacco	8.5	0.8	4.0	13.7	30.6	99.7	680.6
46.4	W. of household goods	7.4	0.8	3.9	13.7	31.5	101.4	618.5
46.5	W. of info. and comm. equipment	9.6	0.8	4.0	13.4	-	-	756.7
46.6	W. of other machinery, etc.	7.8	0.9	4.1	13.5	31.0	96.1	631.0
46.7	Other specialised w. trade	8.1	0.9	4.1	13.8	31.2	98.3	665.7
46.9	Non-specialised w. trade	5.5	0.9	3.9	13.1	29.7	94.0	1,261.2

Note: Some data are missing due to confidentiality.

Source: Eurostat, Structural Business Statistics (sbs\_sc\_dt\_r2), own calculations.

To sum up, the analysis of firm size in wholesale confirms the picture of a heterogeneous sector: firm sizes are quite equal across all sub-sectors, with the exception of wholesale on a fee or contract basis. There is a large number of micro and small firms – around 90% of the whole firm population in the sector – which only account for a small share of turnover and value added. On the other hand, compared to retail trade and manufacturing, there are fewer large firms and there is less concentration of value added, turnover and employment in firms with 250 and more employees.

## 4.2. THE LARGEST FIRMS IN EUROPEAN WHOLESAL

Who are the main actors in wholesale in the European Union? Previous research (Oxford Institute of Retail Management 2014) has shown that concentration is rather low in wholesale. This study finds that 'there are no dominant wholesale companies on a global, European or national scale, even within specific product categories' (Oxford Institute of Retail Management 2014: 8). This is also supported by our presentation of the role of firm size in wholesale. We have shown that the share of the largest firms in total employment in wholesale is much smaller than in retail trade or in manufacturing, which indicates lower concentration.

Empirical evidence provided by the AMADEUS database shows other surprising facts about large firms in wholesale. Nine out of the ten largest firms in the wholesale sector (according to turnover) are part of NACE 46.7, other specialised wholesale – here mainly wholesale of solid, liquid and gaseous fuels and wholesale of metals and metal ores.

We therefore split the ranking of the largest wholesale firms in Europe into three tables: for the largest firms in NACE 46 without NACE 46.7 by revenue (Table 8); a table of the largest firms in NACE 46 without NACE 46.7 by number of employees (Table 9); and one ranking of all firms in NACE 46.7 by revenue (Table 10).

**Table 8 / Largest wholesale trade companies in the EU-28 by revenue, NACE 46 without NACE 46.7, 2014**

NACE 3 digit	Rank	Company Name	Country	Revenue (billion USD)	Employees (thousands)
46.5	1	Hewlett-Packard The Hague BV	NL	78.14	n.a.
46.1	2	Louis Dreyfus Commodities BV	NL	64.72	19.19
46.4	3	Phönix Pharmahandel GmbH & Co.	DE	25.67	24.15
46.5	4	Cisco Systems International BV	NL	24.77	1.08
46.6	5	Baywa AG	DE	18.62	16.94
46.2	6	Nidera BV	NL	18.31	3.82
46.3	7	ITM Alimentaire International	FR	18.28	0.8
46.2	8	Glencore Grain BV	NL	16.15	0.27
46.4	9	Rexel SA	FR	15.9	29.59
46.4	10	H&M Hennes & Mauritz GBC AB	SE	14.64	2.68

Source: Orbis.

We have two wholesale affiliates of US information technology companies (NACE 46.5), Louis Dreyfus as the only wholesale firm on a fee or contract basis (NACE 46.1), one wholesaler of pharmaceuticals (Phönix), three wholesale firms focused on agriculture (Baywa, Nidera and Glencore Grain), one food wholesaler (ITM), one wholesaler of electrical supplies (Rexel) and finally H&M, a firm engaged in clothing. Surprisingly, five out of the ten largest wholesale firms by turnover are located in the Netherlands.

We get a different picture when we look at the largest companies according to the number of employees. This listing is more dominated by food wholesalers and the affiliates of food producers and

supermarkets, such as Lidl, Kaufland, or Rewe. Industria de Diseno Textil SA, the parent company of the textile retailer Zara, is also in this list. The composition of this list raises some doubt about the sectoral classification used by Orbis.

A surprising appearance is made by J D Wetherspoon PLC, which operates pubs and hotels in the UK and Ireland. According to the annual report of J D Wetherspoon, the company is headquartered in the UK, and so we changed the information from Orbis on the country from Ireland to the UK.

**Table 9 / Largest wholesale trade companies in the EU-28 by the number of employees, NACE 46 without NACE 46.7, 2014**

NACE 3 digit	Rank	Company Name	Country	Employees
46.9	1.	Unilever PLC	GB	173,000
46.4	2.	Industria De Diseno Textil SA	ES	137,054
46.3	3.	Associated British Foods PLC	GB	118,209
46.5	4.	Continental Automotive GmbH	DE	103,200
46.3	5.	Kaufland Stiftung & Co. KG	DE	86,217
46.9	6.	Lidl Vertriebs-GmbH & Co. KG	DE	80,000
46.3	7.	Rewe Markt GmbH	DE	52,000
46.5	8.	Jmv GmbH & Co. KG	DE	44,076
46.6	9.	CRH Nederland BV	NL	33,454
46.9	10.	J D Wetherspoon PLC	UK	32,635

Source: Orbis.

For comparison, the following table presents a ranking for sub-sector NACE 46.7 alone. The very high ratios of revenue per employee are an indication that these are pure trading firms.

A considerable share of the largest wholesale firms in the EU is made up of affiliates of a multinational firm from another industry. This means that the European wholesale sector – as measured by its largest firms – mainly consists of multinational firms from other sectors which have decided to integrate the wholesale function into their concern. This leads us to the assumption that wholesale and other sectors of the economy are tightly integrated in joint value chains, or, in another perspective, that wholesale is an integral part of the value chains of many manufacturing industries.

In Table 26 in the Annex we provide a list of the ten largest companies in all NACE 3-digit sub-sectors of wholesale according to Orbis. This list gives a good impression of the heterogeneity of wholesale, for example when we look at the fairly large sub-sector of wholesale of household goods: this ranking is led by a pharmaceutical wholesale firm, followed by a wholesaler of electrical supplies, a wholesaler of clothing, a wholesaler of electrical appliances, etc.

Altogether, the rankings confirm that wholesale trade companies are often affiliates of well-known manufacturing firms which perform the upstream or downstream wholesale functions for their company group. This includes, on the one hand, producers of consumer goods, pharmaceuticals, information technology and consumer electronics. Manufacturing groups are present in NACE 46.5, wholesale of information and communication equipment in particular. Examples are Hewlett Packard and Samsung.

Examples of wholesale affiliates of manufacturing firms from other sectors are the German affiliate of Philip Morris and Carlsberg from Denmark.

**Table 10 / Largest wholesale trade companies in the EU-28 by revenue, NACE 46.7, 2014**

NACE 3 digit	Rank	Company Name	Country	Revenue (billion USD)	Employees (thousands)
46.7	1	E.ON Global Commodities SE	DE	133.87	1.04
46.7	2	Trafigura Beheer BV	NL	127.61	5.33
46.7	3	Shell Trading International LTD	UK	109.17	0.50
46.7	4	BP International LTD	UK	85.91	n.a.
46.7	5	Bp Europa SE	HU	59.61	0.02
46.7	6	Thyssenkrupp Slab International BV	NL	52.30	n.a.
46.7	7	Eni Trading & Shipping SPA	IT	51.91	0.32
46.7	8	Total Marketing Services	FR	29.26	3.55
46.7	9	Shell Trading Rotterdam BV	NL	27.80	0.14
46.7	10	Enel Trade SPA	IT	27.05	0.34

Source: Orbis.

On the other hand, the ranking includes a number of retail supermarkets and utility companies that organise their upstream purchasing business in legally independent affiliates. Examples include ICA from Sweden, Kaufland or Edeka from Germany, E.ON from Germany, and ENI and ENEL from Italy.

The number of genuine wholesale firms on this list – firms that buy commodities from producers and pass them on to manufacturing firms and retail trade – is small. Some can be found in wholesale of agricultural products. Altogether, it seems that the sector is dominated by firms affiliated to other sectors. This may imply that firm strategies in wholesale are also dominated by the logic of these sectors.

### 4.3. CONCENTRATION

Finally, we use the Orbis data, together with aggregate data for the wholesale sector from Eurostat's structural business statistics data, to calculate a C4 concentration ratio for wholesale and its sub-sectors. C4 relates to the share of the four largest firms in total employment in each sector. We use employment instead of turnover or value added, because employment figures are more readily available than value added, and turnover may be misleading because of the high turnover of individual firms in NACE 46.7. This is also the reason why we have excluded NACE 46.7 and 46.9 from the analysis.

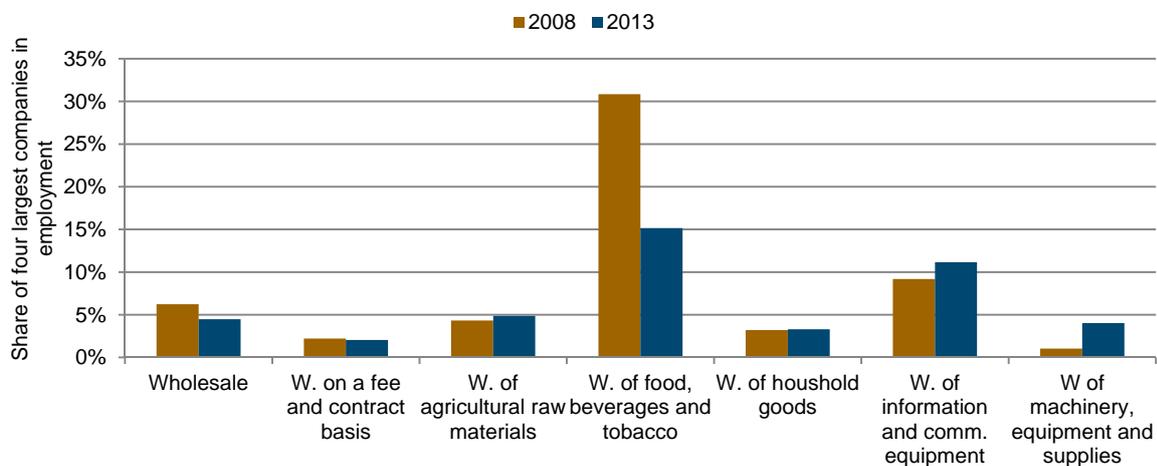
Other caveats to be considered for the analysis are the issues of classification and data availability. Continental Automotive, a German manufacturer of automotive parts, was classified as a wholesaler of information and communication equipment in 2013, which is not correct in our view, and so we have removed this firm from the analysis. Moreover, some larger firms may be missing from the data, and this may make the analysis less stable.

The figure below shows concentration ratios for wholesale and the sub-sectors for 2008 and 2013. Overall, we see a decrease in concentration over the period, which is mainly due to lower concentration

in wholesale of food, beverages and tobacco. By contrast, concentration has increased in four of the six sub-sectors.

The results for wholesale of food, beverages and tobacco should also be taken with a pinch of salt, because Orbis lists three related companies among the five largest firms in the sector in 2008: Kaufland Vertrieb KDSF GmbH & Co. KG, Lidl Vertriebs-GmbH & Co. KG and Kaufland Stiftung & Co. KG. None of these three firms is a public listed company, and so it is difficult to get precise data. However, there may be some double-counting in the data for 2008, which may explain the falling concentration ratio.

**Figure 19 / Share of largest four companies in terms of employment in wholesale and sub-sectors, 2008 and 2013**



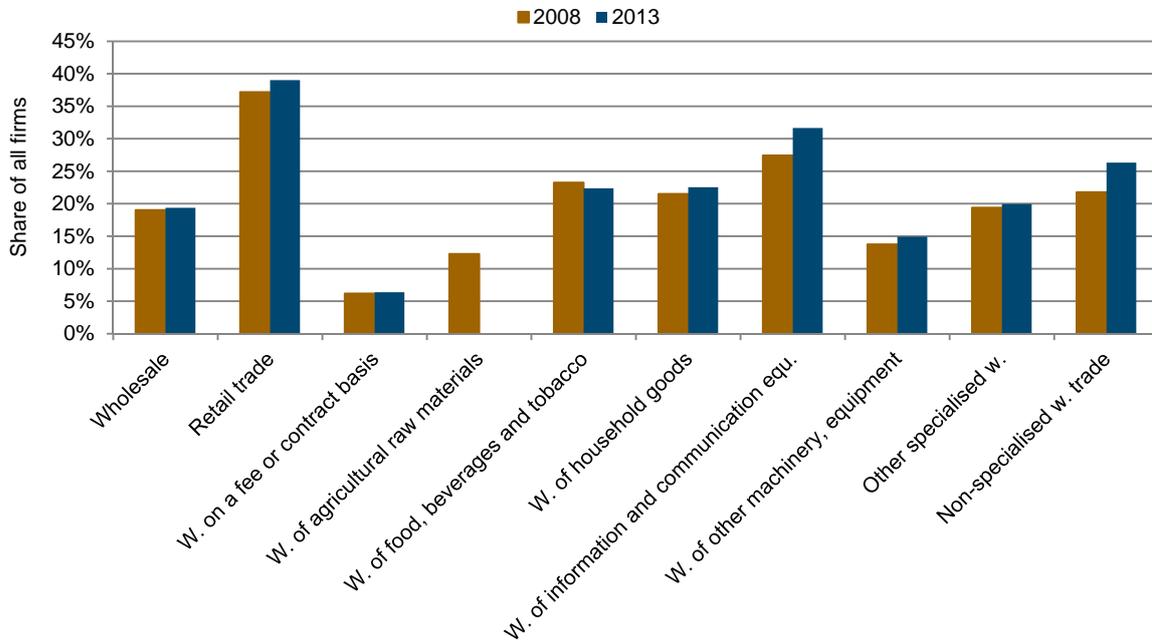
Source: Orbis; Eurostat, Structural Business Statistics (sbs\_sc\_dt\_r2), own calculations.

To obtain a comparison value for concentration, we calculated the share of firms with 250 or more persons employed in total employment in wholesale, retail trade and sub-sectors for the same period, 2008 to 2013.

Here, the data show a very moderate increase in concentration in wholesale, from 19% to a share of 19.4% for firms with 250 and more persons employed. In contrast to the C4 indicator, concentration in wholesale of food, beverages and tobacco is decreasing slightly. A rise in concentration in wholesale of information and communication equipment is confirmed. The two rankings are consistent in their identification of the least concentrated sector. Wholesale of information and communication equipment is ranked second and first in the two approaches.

Altogether, we assume that concentration in wholesale remained stable or went slightly backwards in the period 2008 to 2013. The least concentrated sub-sector is wholesale on a fee and contract basis. A sub-sector with a particularly high concentration is wholesale of information and communication equipment. Altogether, wholesale is much less concentrated than retail trade.

**Figure 20 / Share of companies with 250 or more employees in total employment in wholesale, retail trade and sub-sectors, 2008 and 2013**



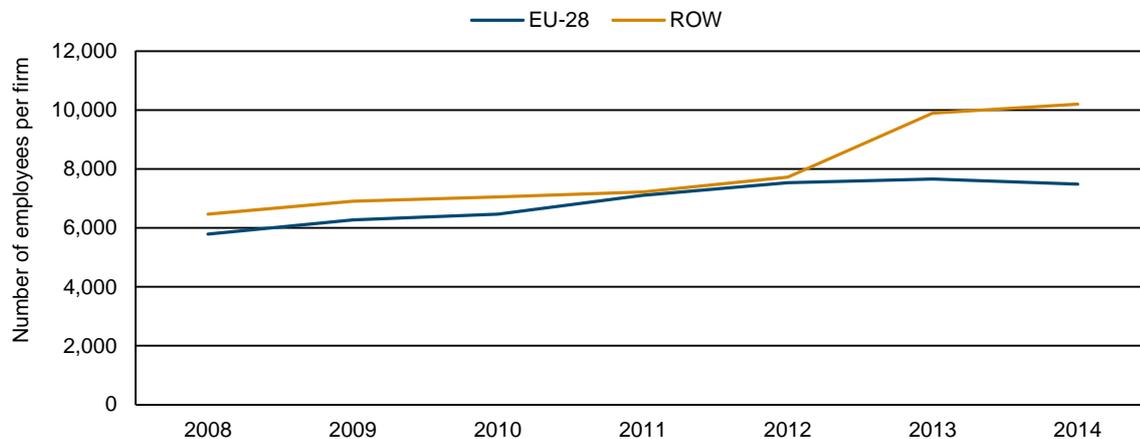
Source: Orbis; Eurostat, Structural Business Statistics (sbs\_sc\_dt\_r2), own calculations.

#### 4.4. THE PERFORMANCE OF WHOLESALERS FROM THE EUROPEAN UNION AND FROM THE REST OF THE WORLD

Based on firm-level data on wholesale companies from the Orbis database, a comparison is made between the top 250 wholesalers in the EU-28 and the top 250 wholesalers in the rest of the world (ROW). The top 250 wholesalers are selected on the basis of the number of employees in 2014. The evolution of their annual account data is analysed. For the wholesale sector as a whole, as well as for each of the eight NACE 3-digit sub-sectors, a sample is created. By using aggregation reports in Orbis, we calculated the sum of the indicator data in case of aggregates (like employment, turnover, value added) or the weighted averages in case of ratios. Since data availability has improved considerably in Orbis in recent years – especially for ROW companies – we decided to focus the benchmark on ratios, as the growing availability of data could cause bias in favour of the rest of the world countries and not necessarily mirror the real performance of the wholesale companies in these countries. Moreover, the Orbis database is better suited to compare ratios, which are less dependent on missing data, as not all countries oblige companies to publish the turnover, value added or number of employees in their annual accounts.

We first look at average firm size. In the top 250 firms, the average EU firm has 7,482 employees, while the average ROW firm has more than 10,200 employees (Figure 21). Thus the average EU firm is around 25% smaller than the average ROW firm.

**Figure 21 / Average number of employees of EU-28 wholesale firms and wholesalers from the rest of the world (ROW), 2008–2014**



Source: Orbis.

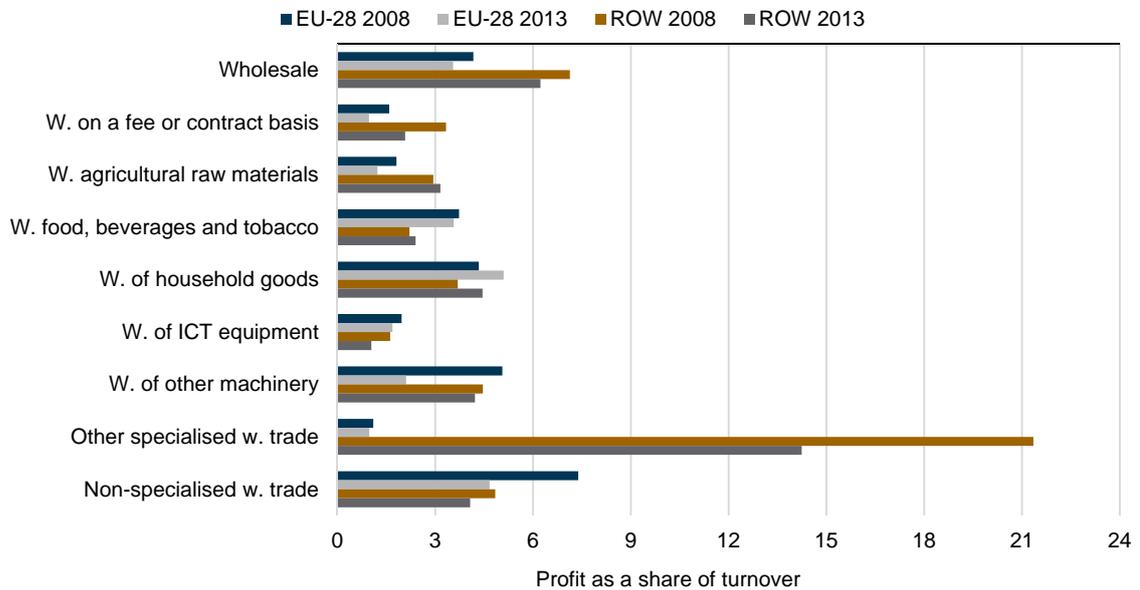
This size advantage is only a very recent phenomenon, as the following figure shows. We may therefore speculate that it is due to some major mergers, or some reclassifications in the Orbis database – or simply because some values of non-listed firms are estimates. We have already noted in the previous section on concentration that there may be double-counting in the data.

Further benchmarking between European wholesalers and their foreign competitors will be based on two indicators, where sufficient and representative data are available for both regions: profit margin and turnover per employee. Value added per employee was not selected, because of the very low availability of this indicator in the ROW countries: less than 20% of companies had this indicator available, while turnover is available for more than 80% of the top 250 companies, both in the EU and the ROW.

From Figure 22 we conclude that the profit margin decreased in the EU-28 and the ROW between 2008 and 2013, by 15% and 13%, respectively. Average profit margin in the ROW was 6.8%, which is significantly higher than the 4.1% in the EU-28. Only European wholesalers in food and beverages, household goods and ICT equipment managed to outperform their ROW competitors. In general, low profit levels in European sub-sectors are associated with low profit levels in the corresponding sub-sectors in the ROW. There is an exceptionally high profit level in the ROW sub-sector NACE 46.6, wholesale of other specialised goods (which contains very heterogeneous products like fuels, metals, building materials, chemical products, diamonds, etc.), which may be linked to the very high concentration in this sector of Russian wholesalers that are also the main mining companies for these goods (companies like Gazprom, Lukoil, etc.).

At the sub-sector level, most sectors in the EU and the ROW are moving in the same direction (positive or negative). Profit margins of wholesalers in most sub-sectors in both regions changed by less than 1 percentage point. The profit margins of European wholesalers of other machinery and wholesalers of non-specialised products were hit most by the economic and financial crisis. In the rest of the world, the exceptionally high profit margins of wholesalers in other specialised goods decreased, although they remain very high in 2013, with profit margins of more than 14%.

**Figure 22 / Profit margin in wholesale sub-sectors for the top 250 companies (in terms of employment), EU-28 and rest of the world (ROW), 2008 and 2013**



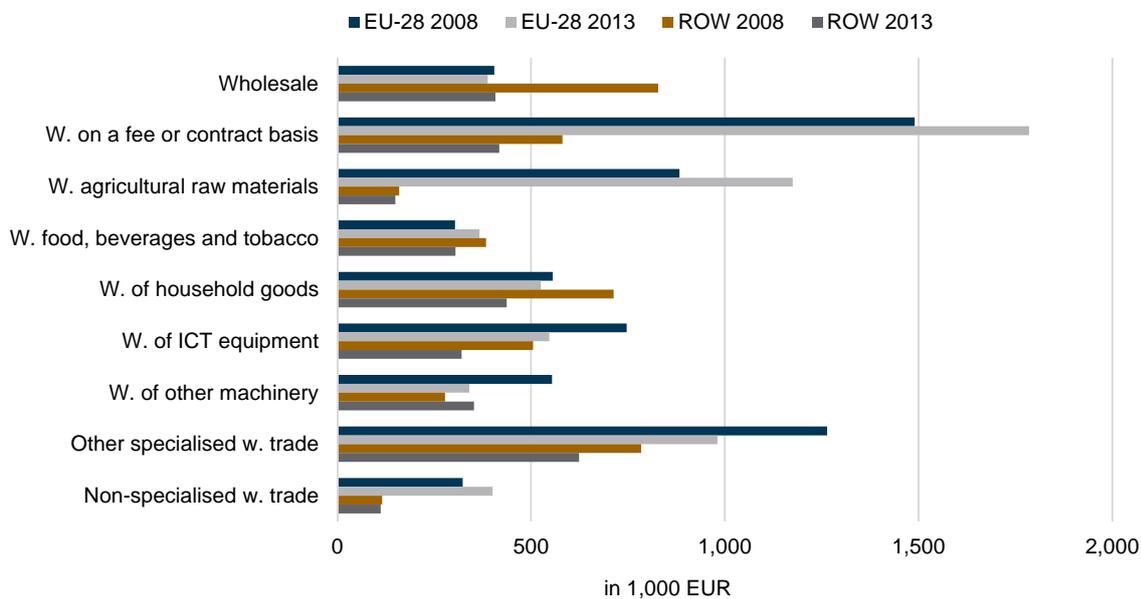
Source: Orbis.

In 2008, the operating revenue per employee of ROW wholesalers as a whole was more than double the average operating revenue per employee in the EU-28. By 2013, however, the ratio for ROW firms had dropped substantially – by more than 50%, to a level that is close to that of the European wholesalers, whose operating revenue per employee had dropped by more than 4% compared to 2008. At the sub-sector level, however, European wholesalers tend to have larger operating revenue per employee ratios than the worldwide wholesalers. The higher operating revenue per employee in 2008 for the worldwide wholesale sector as a whole can be explained by the strong presence of wholesalers from NACE 46.4 (many of them from Japan). In the EU, wholesalers of food and beverages and household goods have a large share in the number of wholesalers. Moreover, in 2008 European food and beverage (etc.) wholesalers were smaller than ROW food and beverage (etc.) wholesalers.

In the EU, wholesalers on a fee or contract basis and wholesalers of agricultural raw materials are very different from their worldwide counterparts; EU firms reveal much higher turnover/employee ratios. The gap between the groups widened between 2008 and 2013. In other sub-sectors the geographical differences are smaller.

The evolution of operating revenue from 2008 and 2013 in the figure below indicates that structural changes in the different sub-sectors quite often went in opposite directions in the EU-28 and the ROW. In all sub-sectors, except for wholesale of other machinery, the operating revenue per employee went down between 2008 and 2013.

**Figure 23 / Turnover per employee in thousand EUR in wholesale sub-sectors for the top 250 companies, EU-28 and rest of the world (ROW), 2008 and 2013**



Source: Orbis.

#### 4.5. SUMMARY

Average firm size is considerably lower in wholesale than in manufacturing, and is roughly similar to retail trade. Only 1.4% of all wholesale firms have more than 50 persons employed; however, this group accounts for more than half of total turnover and value added generated in the sector. There are considerable differences in terms of firm size across EU Member States. For example, in the German, Danish or UK wholesale sector, firms are double the size of firms in Poland or the Netherlands, and three times the size of firms in the Czech Republic, Slovakia and Italy.

The largest wholesale firms in Europe are often affiliated with well-known retail or manufacturing conglomerates to perform wholesale functions for their parent group. The number of independent wholesale companies among the largest firms in the sector seems low. Concentration is highest in the wholesale of information and communication equipment, while the lowest degree of concentration is found in wholesale on a fee and contract basis. This sector provides many opportunities for self-employment, and micro and small enterprises.

The top 250 non-EU wholesale firms are larger and enjoy a higher profit margin than the top 250 EU wholesale firms, which is mainly due to a considerably higher profitability of non-EU firms in other specialised wholesale trade – a sector that mainly trades in oil, raw materials and construction materials. All other sub-sectors of wholesale reveal comparable profit margins of EU and non-EU firms. Operating revenue per employee is also quite similar for both groups of firms. Convergence in this indicator is due to a considerable slide in revenue per employee of non-EU firms between 2008 and 2013.

## 5. Productivity and profitability in wholesale

Productivity and profitability are key determinants for the competitiveness of industries. Only productive and profitable firms can invest in technology and innovation, which are, in turn, key to maintaining competitiveness. Hence, Chapter 5 provides in-depth insights regarding productivity and profitability across countries and sub-sectors, and explores the development of the European wholesale trade towards an integrated single market.

### 5.1. PRODUCTIVITY

We first look at how European countries differ in their productivity levels in the wholesale sector, see if this can be explained by the composition of the sector, and analyse whether productivity levels in European wholesale have converged over recent years. A previous study on productivity convergence in the Eurozone (Sondermann 2012) found no convergence at the aggregate level, and convergence at the sectoral level only in some industries.

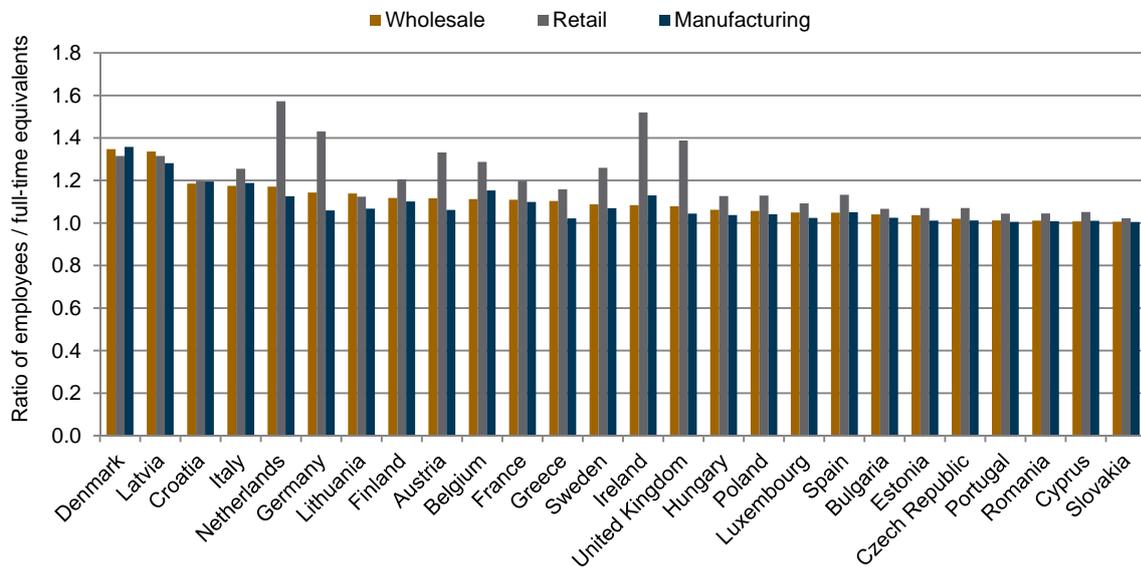
Before we go into detail, there is a need to discuss how to measure productivity in wholesale services. A first important indicator is value added. Value added at factor cost is 'the gross income from operating activities after adjusting for operating subsidies and indirect taxes' (Eurostat 2016). In other words, value added is the output of the firm minus the goods used to produce this output (for the calculation of value added, see Table 25 in the Annex).

Labour productivity is then defined as the value added at factor cost divided by the number of persons employed (Eurostat 2016). Labour productivity is sensitive to a bias from part-time employment, since a high share of part-time employment lowers productivity levels because of fewer hours worked. This does not affect comparisons within wholesale, but would make comparisons across sectors difficult.

To check for this bias, the following Figure 24 presents the ratio of the number of employees by head-count and by full-time equivalent. The lower the value, the smaller the share of part-time employees. The figure indicates that part-time employment in wholesale is roughly the same level as in manufacturing, and is considerably lower than in retail, in particular if we look at the Netherlands, Germany or the UK. The highest levels of part-time employment – regardless of sector – are found in Denmark, Latvia and Croatia. Data provided by Eurofound (2014) come to the same conclusion; also Eurofound finds that part-time work is less common in wholesale than in the total business sector.

Productivity in the wholesale sectors is only slightly lower than productivity in manufacturing, but is considerably higher than in retail trade. This reflects the much lower personnel intensity in wholesale than in retail, but also the higher share of part-time employment in retail. Wage-adjusted labour productivity is at about the same level in wholesale and manufacturing (labour productivity is 142% of average wage costs in wholesale vs. 144% in manufacturing) and considerably higher in wholesale than in retail trade, where labour productivity is 119% of average wage costs.

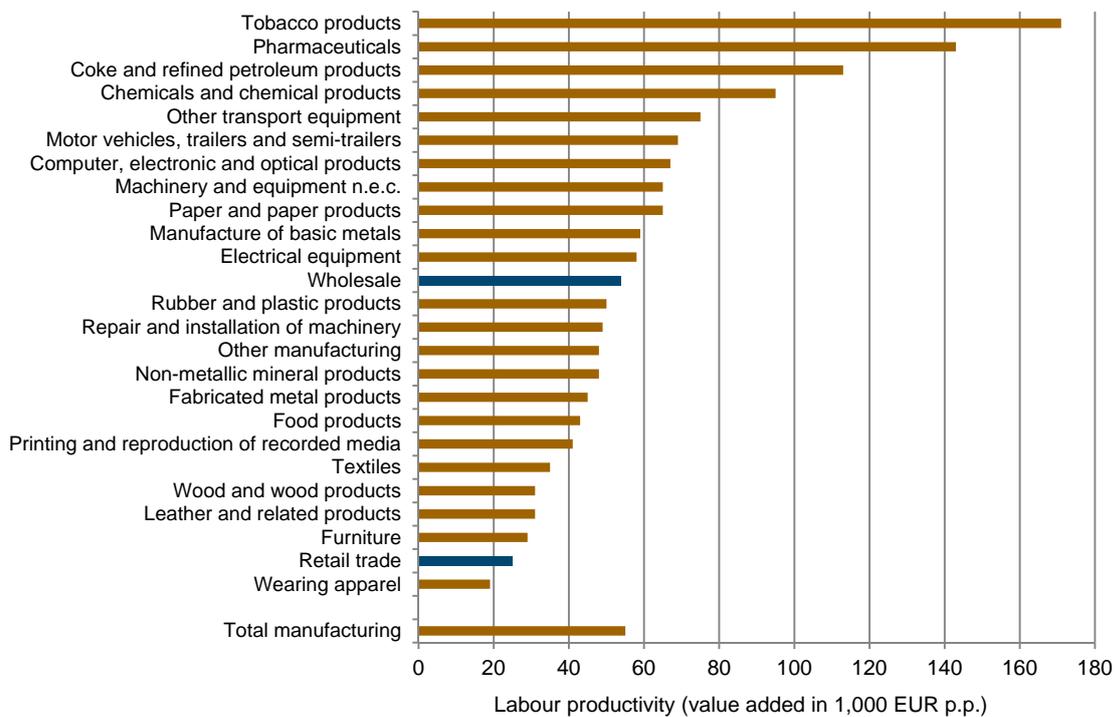
**Figure 24 / Ratio of the number of employees by head-count and in full-time equivalent, wholesale, retail and manufacturing, EU member countries, 2013**



Note: Ireland, value for 2012.

Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

**Figure 25 / Labour productivity in wholesale, retail trade and manufacturing sub-sectors, EU-28, 2013**



Source: Eurostat, Structural Business Statistics (sbs\_na\_ind\_r2, sbs\_na\_dt\_r2), own calculations.

If we compare wholesale with various sub-sectors of manufacturing, it turns out that productivity in wholesale is higher than in large parts of manufacturing. In particular, productivity in wholesale is higher than in a number of low-technology sectors, such as textiles, clothing, rubber and plastic, food, or wood and paper. Again, this is a sign of the lower labour intensity in wholesale.

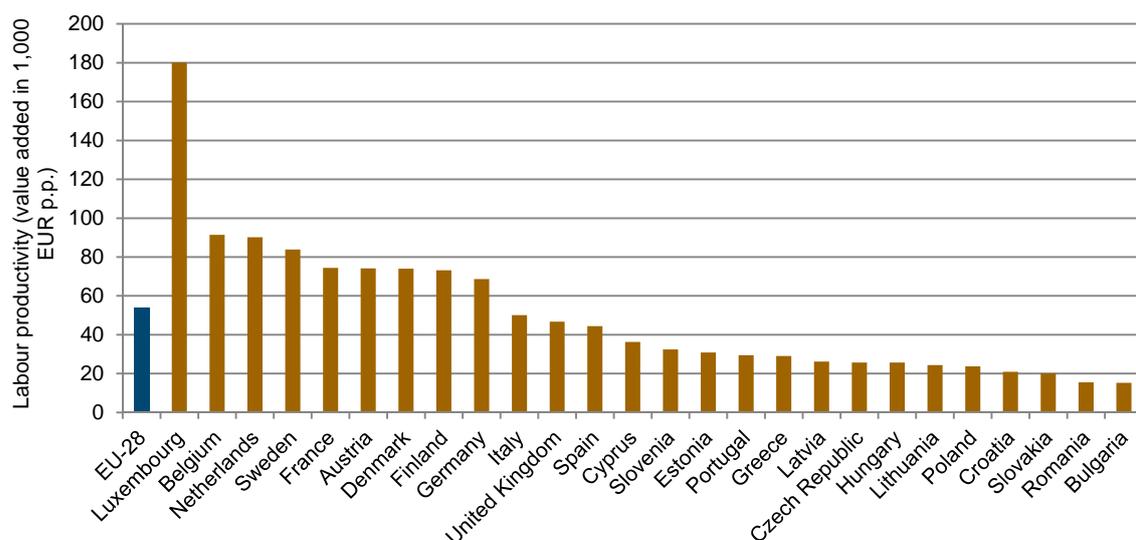
A comparison of the EU-28 countries' labour productivity in the wholesale sector is displayed in Figure 26. Particularly, the high value of Luxembourg stands out: with labour productivity of over EUR 180,000 per person employed (p.p.), Luxembourg's productivity is almost double that of its nearest EU-28 rivals, and is more than three times the average EU-28 value.

At the sub-sectoral level, the high labour productivity of Luxembourg can be attributed to an exceptionally high value in the sub-sector NACE 46.7 (other specialised wholesale). Whereas the mean labour productivity in this sub-sector of the remaining 27 countries was EUR 44,000 p.p. in 2013,<sup>1</sup> Luxembourg's labour productivity was more than EUR 322,000 p.p.

EU Member States can be classified into two groups according to labour productivity in wholesale: a first group with values above the EU-28 average consists of Luxembourg, Ireland, Belgium, the Netherlands, Sweden, France, Austria, Denmark, Finland and Germany (in order of descending values). It may be no coincidence that Luxembourg and Ireland lead this ranking: corporate taxation may be a reason for the location of the wholesale activities of non-European firms in these countries.

The second group (those at or below the EU-28 average) is led by Italy and the UK, and includes all Southern European members and the countries which joined the EU in 2004. The gap between Germany and the next country in the ranking, Italy, is notable. The lowest apparent labour productivities are found in Bulgaria and Romania, with values of about EUR 15,000 p.p.

**Figure 26 / Apparent labour productivity across EU countries for NACE 46, 2013**



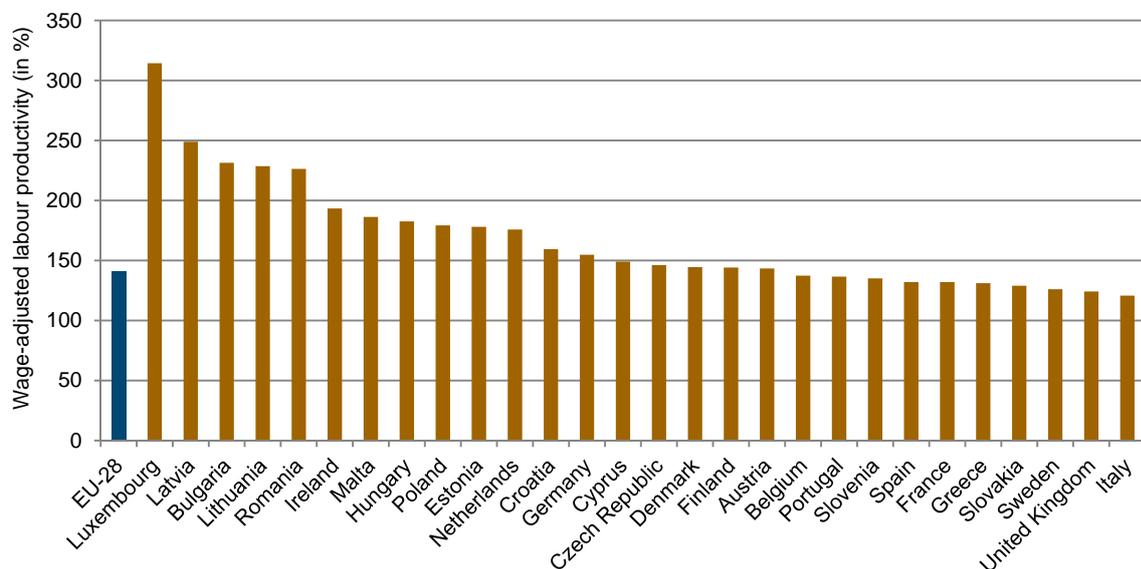
Note: Ireland, value for 2012.

Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

<sup>1</sup> For Ireland, the value for 2012 was used.

Taking a look at wage-adjusted labour productivity (defined as value added per employee as a percentage of wage costs) in Figure 27, Luxembourg again exhibits the highest value, with over 314%. However, the ranking from there on differs from that of apparent labour productivity (Figure 26). Latvia, Bulgaria and Lithuania are ranked second, third and fourth, with values of 249%, 231% and 229%, respectively, followed by Romania with 226%. In comparison, these countries are all found in the lower third of countries in the ranking of apparent labour productivity. Italy, the United Kingdom and Sweden show the lowest wage-adjusted productivity (121%, 124% and 126%). In the case of Sweden, this is almost a reversal of the order compared to apparent labour productivity, since there it ranked among the top five countries. This is due to the fact that Sweden exhibits the highest average personnel costs of the EU-28 countries (EUR 58,000 p.p.).

**Figure 27 / Wage-adjusted labour productivity across EU countries for NACE 46, 2013**



Note: Ireland, value for 2012.

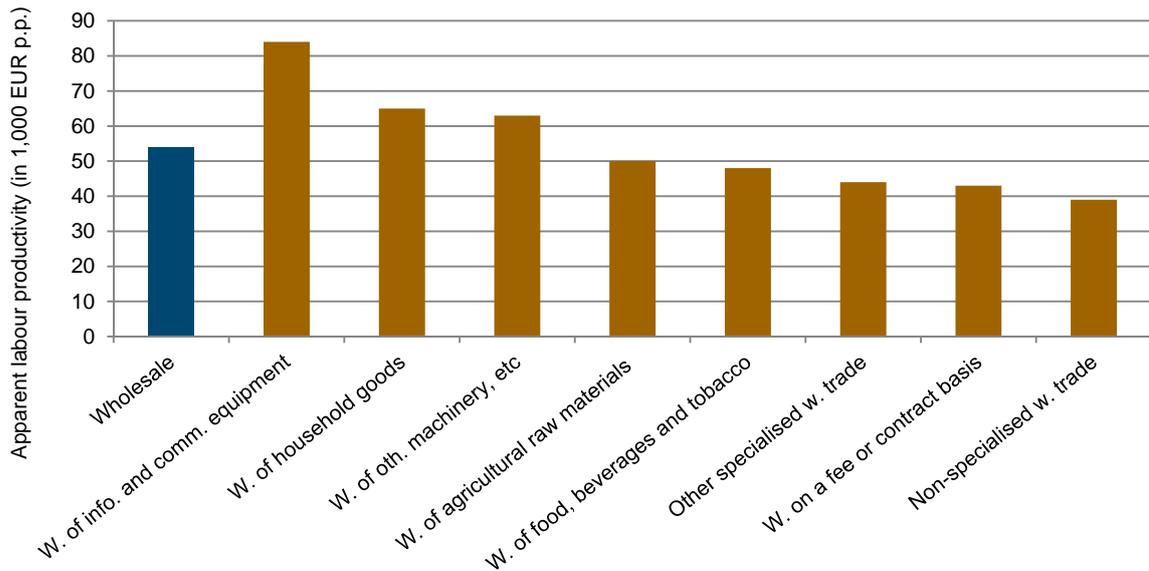
Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

Evidence on the aggregate sector level is somewhat insufficient in a diverse sector like wholesale trade. This is why a breakdown of labour productivity at a sub-sector level is shown in Figure 28.

For the EU-28 countries, the sub-sector with the highest apparent labour productivity is NACE 46.5 (wholesale of information and communication equipment) with a value of EUR 84,000 p.p., followed by the sub-sectors NACE 46.4 (wholesale of household goods) and NACE 46.6 (wholesale of other machinery, equipment and supplies) with values of EUR 65,000 and EUR 63,000 p.p., respectively. Wholesale of information and communication equipment is also the most productive sector in ten of the 27 EU Member States for which data are available. So, the EU-28 result is biased by some large countries, most notably Germany, where wholesale of information and communication equipment has a considerable productivity advantage over all other sub-sectors. Figure 89 in the Annex provides evidence for productivity differences between wholesale sub-sectors at the country level.

All three of these high-productivity sub-sectors exhibit values higher than the labour productivity of the aggregated wholesale sector (NACE G46). The sub-sectors with the lowest labour productivities are NACE 46.9 (non-specialised wholesale trade) and NACE 46.1 (wholesale on a fee or contract basis). The last two sectors have only half the labour productivity of NACE 46.5.

**Figure 28 / Differences in apparent labour productivity at sub-sector level for EU-28, 2013**



Note: Ireland, value for 2012; Luxembourg, values for 2012 for sub-sectors W. of food, beverages and tobacco and other specialised w. trade

Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

When looking at the countries' labour productivities at the sub-sector level (3-digit level), one sub-sector stands out, namely NACE 46.7 (other specialised wholesale). This sub-sector is characterised by a notably high value of Luxembourg of EUR 322,900 p.p. The total EU-28 labour productivity in this sub-sector, however, is comparatively low at only EUR 44,000 p.p. A look at the data provided by the Orbis database reveals that two firms, ArcelorMittal Flat Carbon Europe SA and ArcelorMittal Sourcing SCA, have a combined turnover of EUR 32 billion and combined earnings before interest and taxes (EBIT) of EUR 665 million, but only 172 employees.

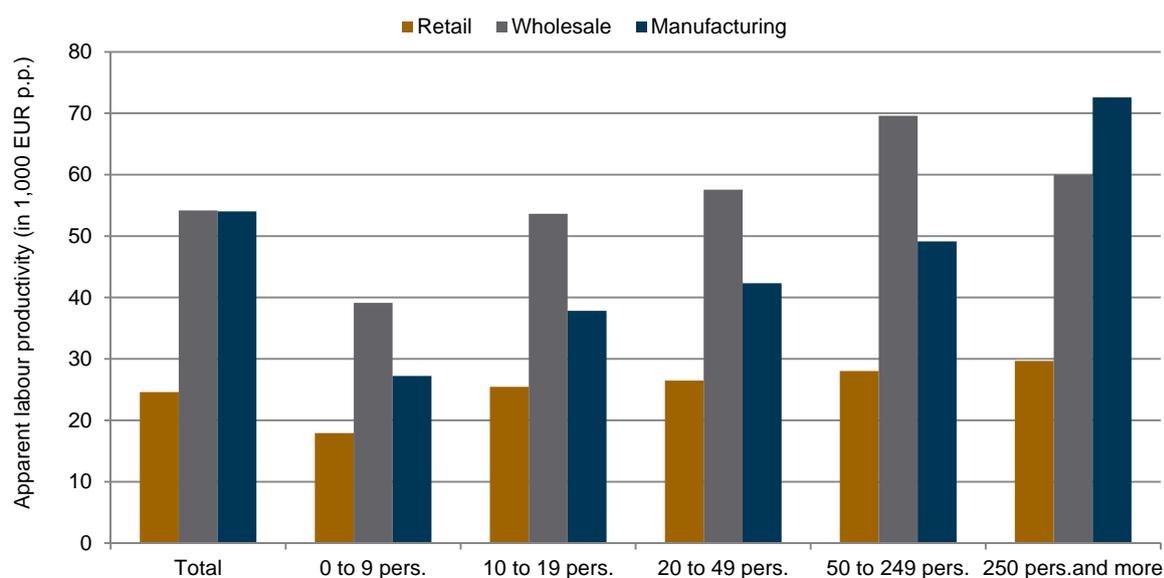
We therefore assume that the high overall labour productivity of Luxembourg is the result of only a few firms with very high value added and very few employees, such as firms trading in raw materials, energy or chemical products. The data for Luxembourg also reveals similar characteristics of other firms. The example of Amazon selecting Luxembourg as its European headquarters (Financial Times 2014) illustrates that trading firms also consider tax as one factor for the choice of their location. This may also explain the high productivity in Ireland.

Moving to the NACE 4-digit level, we find the highest productivity in NACE 46.35, wholesale of tobacco products, followed by NACE 46.46, wholesale of pharmaceutical goods and NACE 46.51, wholesale of computers, computer peripheral equipment and software.

Particularly low productivity within the wholesale sector can be found in NACE 46.13, agents involved in the sale of timber and wood, NACE 46.77, wholesale of waste and scrap, and NACE 46.19, agents involved in the sale of a variety of goods. There is a difference between the highest productivity (NACE 46.35) and the lowest productivity (NACE 46.19) of more than 350%, and so the average person employed in wholesale of tobacco products generates three and a half times the value added of the average person employed in agents involved in the sale of a variety of goods.

Finally, we look at the relationship between firm size and productivity. This relationship is best studied at the firm level, which is not available for this study. However, we can look at the distribution of productivity levels across different firm sizes in a first step (Figure 29). Here, we see that productivity increases in all three sectors with firm size. However, in wholesale it seems that there is a limit for productivity increases for firms with more than 250 persons employed.

**Figure 29 / Firm size and labour productivity in wholesale, retail trade and manufacturing, EU-28, 2013**



Note: No values for Estonia, Ireland, Lithuania, Malta, Luxembourg.

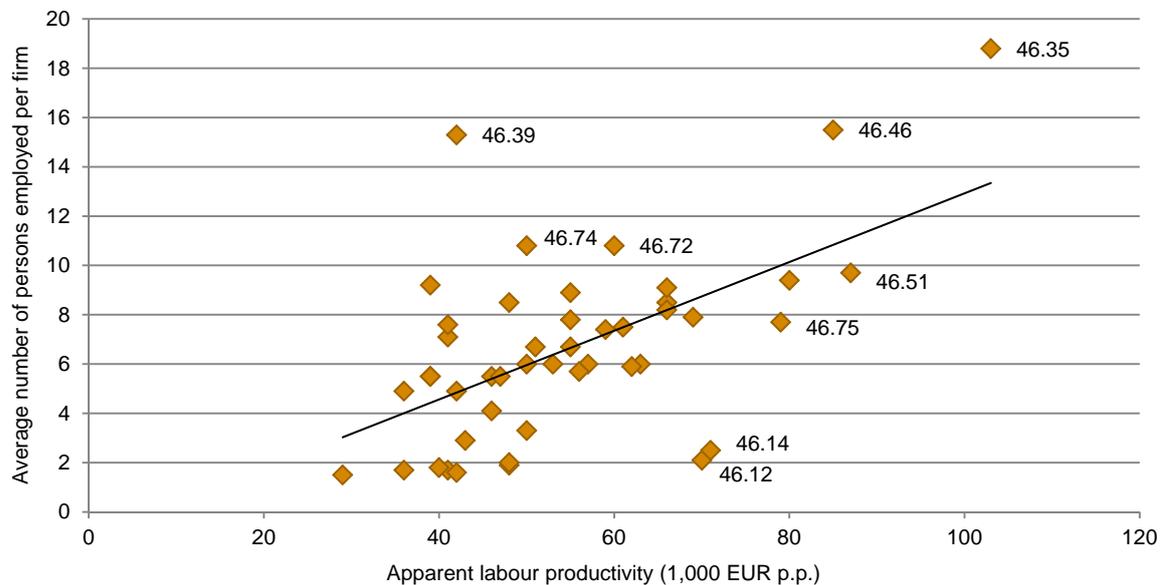
Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

Here, readers should recall the finding from the section on firm size in wholesale: we showed that the largest firms' share of total employment in wholesale is much smaller than in retail trade or in manufacturing, which indicates lower concentration. The decreasing productivity in the largest size class is an explanation for this phenomenon; there seems to be a threshold for economies of scale and other size advantages in wholesale, which makes growth less attractive once firms have reached this size.

Readers should also note that productivity is higher in wholesale than in manufacturing in all but the highest size class. This highest size class is the reason why total wholesale does not have higher productivity than manufacturing.

In a second step, we employ sectoral data at the NACE 4-digit level. Again, the data reveal a positive relationship between the two variables, with a correlation coefficient of 0.57, so firms in sectors where the average firm size is larger also tend to be more productive. We find both the largest firms and the highest productivity in NACE 46.35, wholesale of tobacco products, followed by NACE 46.46, wholesale of pharmaceutical goods and NACE 46.51, wholesale of computers, computer peripheral equipment and software. Particular outliers are NACE 46.39, non-specialised wholesale of food, beverages and tobacco, NACE 46.72, wholesale of metals and metal ores and NACE 46.74, wholesale of hardware, plumbing and heating equipment and supplies. All three sub-sectors have above-average firm size compared to their productivity. By contrast, NACE 46.12, agents involved in the sale of fuels, ores, metals and industrial chemicals, and NACE 46.14, agents involved in the sale of machinery, industrial equipment, ships and aircraft, reveal below-average firm size compared to their productivity.

**Figure 30 / Firm size and labour productivity at NACE 4-digit level, wholesale, EU-28, 2013**



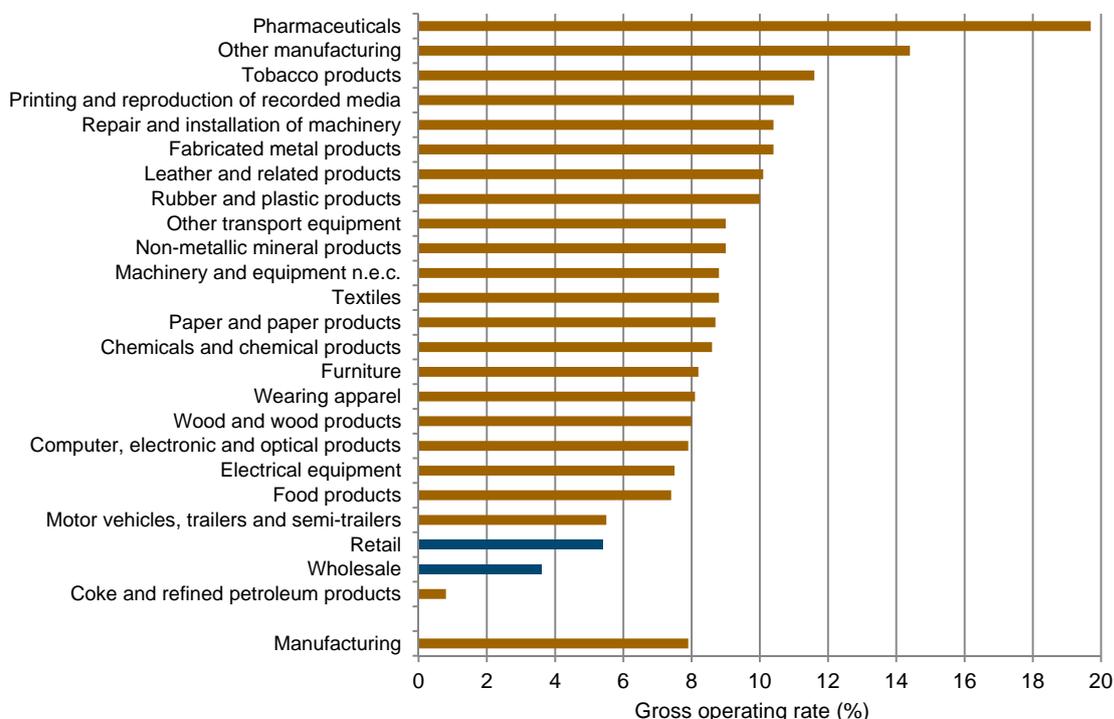
Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

## 5.2. PROFITABILITY

As an indicator for profitability, we use the gross operating rate. This is defined as the gross operating surplus (i.e. value added minus personnel costs), which is the surplus generated by operating activities after the labour factor input has been recompensed, divided by the turnover (Eurostat 2016).

In general, profitability is low in wholesale trade, but also in retail trade. The figure below compares profitability in manufacturing sub-sectors with profitability in wholesale trade and retail trade. We see that both trade sectors lie at the lower end of the spectrum, with only the manufacturing of coke and refined petroleum products below them. An initial explanation for this low profitability is the calculation of this indicator, which includes turnover: turnover in manufacturing is somewhat different from turnover in trade, and so there is inevitably a bias towards manufacturing here. This bias, however, is not relevant if we only compare wholesale across countries or different sub-sectors of wholesale.

**Figure 31 / Profitability (gross operating rate) for manufacturing, manufacturing sub-sectors, wholesale and retail trade, EU-28, 2013**



Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

A country comparison of wholesale profitability levels in the EU-28 can be appreciated in Figure 32. Differences in profitability levels in the EU-28 are considerable. The highest percentage values are found in Lithuania (5.7%), Greece (5.3%) and Romania (5.3%), whereas by far the lowest value is found in the United Kingdom, with only 1%. Some 22 of the 27 countries plotted exhibit values above the total EU-28 value of 3.6%. The profit rates across the countries are symmetrically distributed, i.e. there is no bias towards the high or low end, which is indicated by an almost equal mean and median value (4.2% and 4.4%).

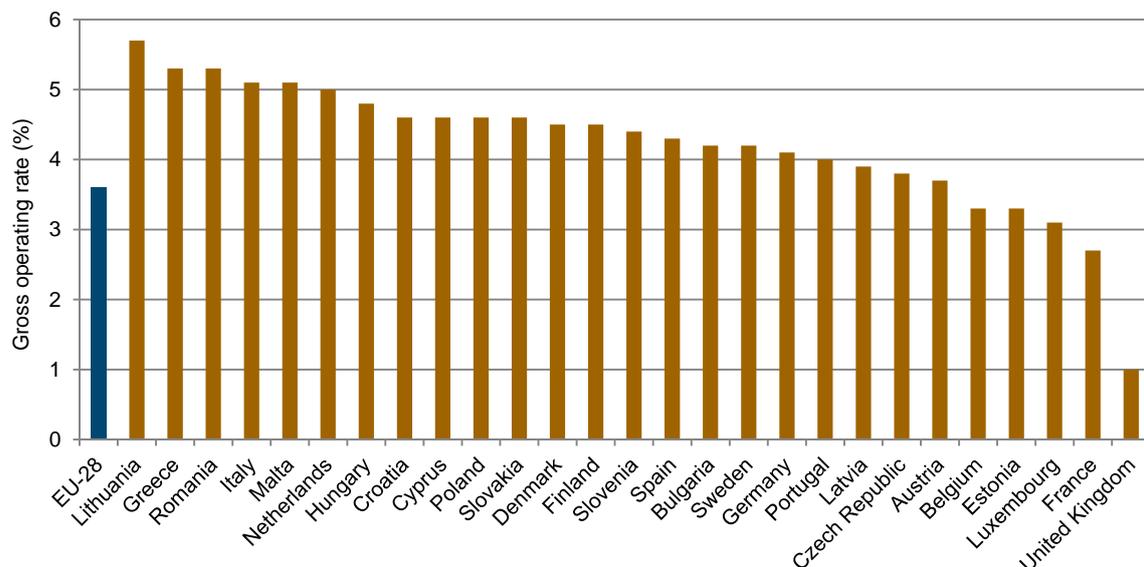
The United Kingdom stands out with very low profitability. A closer look at the data (Figure 89 in the Annex presents a full breakdown of profitability at sub-sector and country level) shows that this is mainly due to NACE 46.7, other specialised wholesale trade, which is wholesale trade in oil, metals, ores, chemicals and other industrial raw materials. Here, the UK reveals a **negative** profitability for 2012 and 2013. In 2013, this is mainly due to negative profitability in the wholesale of solid, liquid and gaseous fuels and related products. The gross operating surplus for the UK in this sub-sector was negative (22 billion EUR) in 2013, compared to a negative value of around 10 billion EUR for the EU-28. Only in the case of Croatia is there another (comparatively low) negative value for profitability (EUR 69.3 million); and so, the negative value for the EU-28 is mostly a result of the UK, and the UK wholesale sector suffers from this one sub-sub-sector.

We discussed this finding with Eurostat to rule out any data error. Eurostat confirmed that the data are correct and are due to negative value added in the UK wholesale sector for this year. Looking at the

level of individual firms, the largest firms in the UK in NACE 46.7 are Shell Trading International Ltd, BP International Ltd and Sinochem International Oil Co., all three active in the wholesale of energy, in particular oil. We therefore assume that the negative gross operating profit of the UK in this sector is the result of the trading activities of these companies.

The country order illustrated in Figure 32 does not hold when we investigate absolute profits – the gross operating surplus, i.e. without relating profits to turnover. In terms of gross operating surplus, the country with the highest value is Germany, with over EUR 47.34 billion, whereas in Figure 32 it ranks among the ten countries with the lowest gross operating rate. Similarly, France and the United Kingdom exhibit relatively high values of gross operating surplus (over EUR 21.79 billion and EUR 12.05 billion) but rank as the last two countries with respect to their gross operating rate. Only for Italy and the Netherlands do the two indicators actually coincide to some degree.

**Figure 32 / Profitability (gross operating rate) across countries for NACE 46, 2013**



Notes: Ireland excluded, due to lack of data.

Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

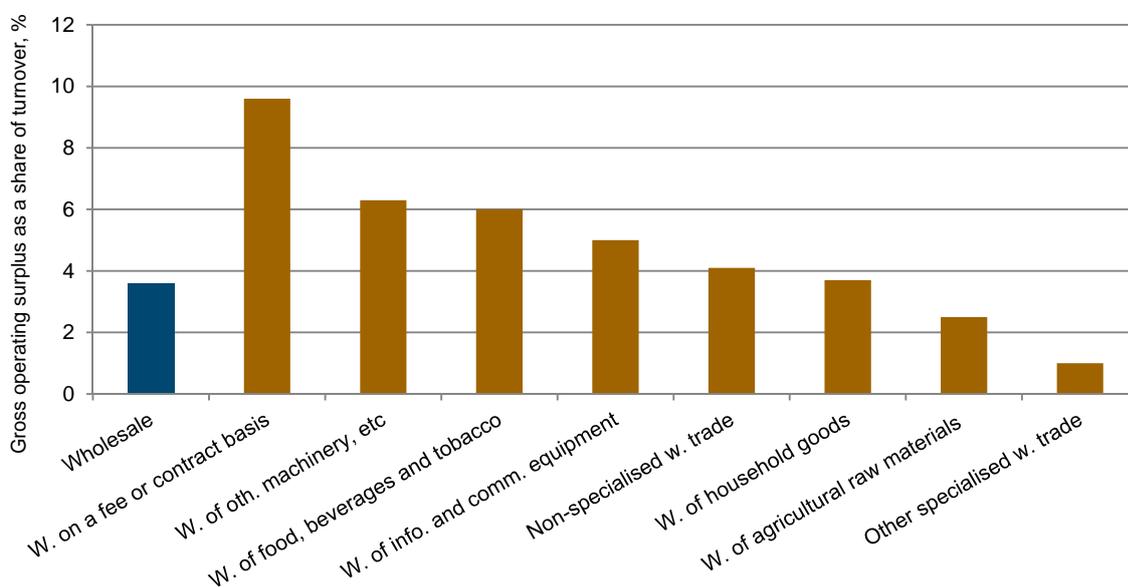
Examining profitability at the sub-sector level reveals considerable differences (see Figure 33). The value at the aggregated wholesale sector (NACE 46) is 3.6% and hence is lower than the mean over the sub-sectors (4.8%). This indicates the existence of some sectors with considerably higher profitability than the EU average. Individual sub-sector values indeed range from only 1% in the sub-sector NACE 46.7 to 9.6% in NACE 46.1, wholesale on a fee or contract basis. The low profitability in NACE 46.7 (as discussed above) is due to this sub-sector in the UK, which has a negative gross operating surplus. NACE 46.1 is not defined by a common good but rather by the way business is conducted. So it is difficult to say in what particular goods markets these extra-normal profits exist.

One may assume that productivity and profitability are positively related. A comparison of the gross operating rate with the labour productivity of the sub-sectors (without NACE 46), however, shows only a low correlation (Pearson's correlation coefficient of 0.16) between the two indicators, suggesting that the

productivity in a sub-sector is not related to profitability. One noticeable example is the sub-sector NACE 46.1, which has the highest profitability of the sub-sectors, but also the second-lowest labour productivity.

Looking at absolute gross operating surplus at the sub-sector level, the relationship described looks slightly different. Here, Pearson's correlation coefficient is 0.68 (excluding NACE 46.5, where no data are available), indicating a clear positive relationship between labour productivity and profit (measured by the gross operating surplus).

**Figure 33 / Differences in profitability (gross operating rate) at sub-sector level for EU-28, 2013**



Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

### 5.3. WHOLESALE AND THE EUROPEAN SINGLE MARKET

Wholesale trade can contribute to the integration of the European single market by bridging national markets and connecting producers, retail trade and industrial demand across Europe. An issue of the project is therefore to examine the contribution of wholesale trade to market integration and efficiency.

In a single market, different national prices tend to converge to one single, common price due to factor movements and competition (Marinello et al. 2015). Europe strives for this ideal; however, it seems that the EU still has no fully integrated common market for goods, services, labour and capital (Marinello et al. 2015).

The literature so far has employed mark-up – the difference between price and marginal cost – as a measure for market inefficiencies (Sauner-Leroy 2003; Badinger 2007). However, there is no information on wholesale prices in the European Union, and so we tackle this question indirectly: systematic differences between European countries in productivity and profitability of the wholesale sector may

point to different degrees of competition and/or efficiency in wholesale, in particular if we look at similar wholesale sub-sectors in different countries.

There may be market inefficiency if wholesale profits and/or productivity are higher in one country than another, since this may point to difficulties for wholesale from other countries in entering the country and bringing prices down. These differences, however, may also reflect specific services like search, storage, etc. that wholesale provides, or they may reflect market concentration.

We further operationalise this topic with the following questions:

- › Are there significant differences between countries in terms of wholesale productivity or profitability as measured by indicators provided by Eurostat?
- › Are there significant differences in the wholesale margins as measured by input-output data across countries?
- › Can these differences be explained by differences in the sub-sectoral structure of wholesale trade across countries?
- › Are there barriers to the cross-border integration of the wholesale market?
- › How does market integration affect efficiency in the wholesale sector?

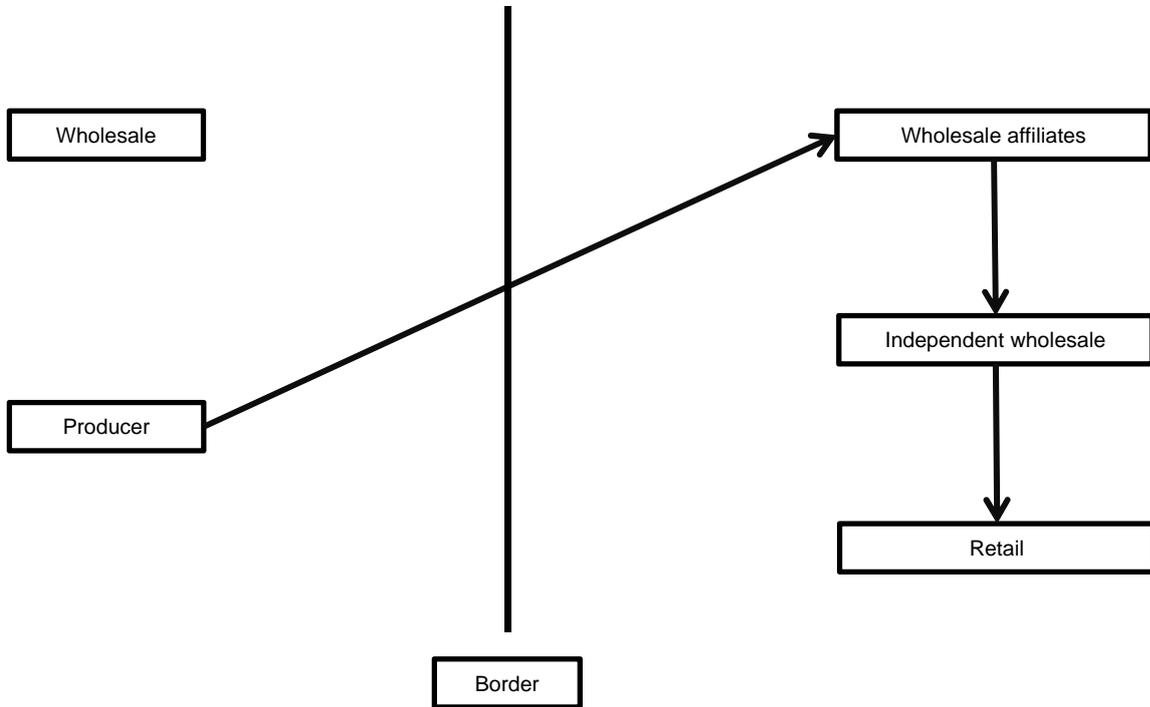
Most of these questions will be tackled in this chapter. Evidence on wholesale margins with input-output data is given in Chapter 8. The case study in Chapter 9 discusses some specific barriers to cross-border integration in one particular wholesale segment – wholesale of mining, construction and civil engineering machinery.

Another important question related to wholesale and the single market is the question of the role of territorial supply constraints raised by multinational firms via their wholesale supply structures in the EU Member States. In effect, this means that firms aim at having full control over the supply channels for their products. The questions were raised at the inception meeting of this project: Can wholesale also hamper market integration? What is the role of territorial supply constraints and how can these be measured?

From the viewpoint of regulation, territorial supply constraints have an anti-competitive character, since they reduce the number of potential sellers in a market and increase the potential costs of market entry. Moreover, they contradict the principle of the free movement of goods and the principle of non-discrimination based on nationality. From a consumer perspective, they may also reduce welfare, because they may reduce the number of goods in a certain category from which a consumer can choose.

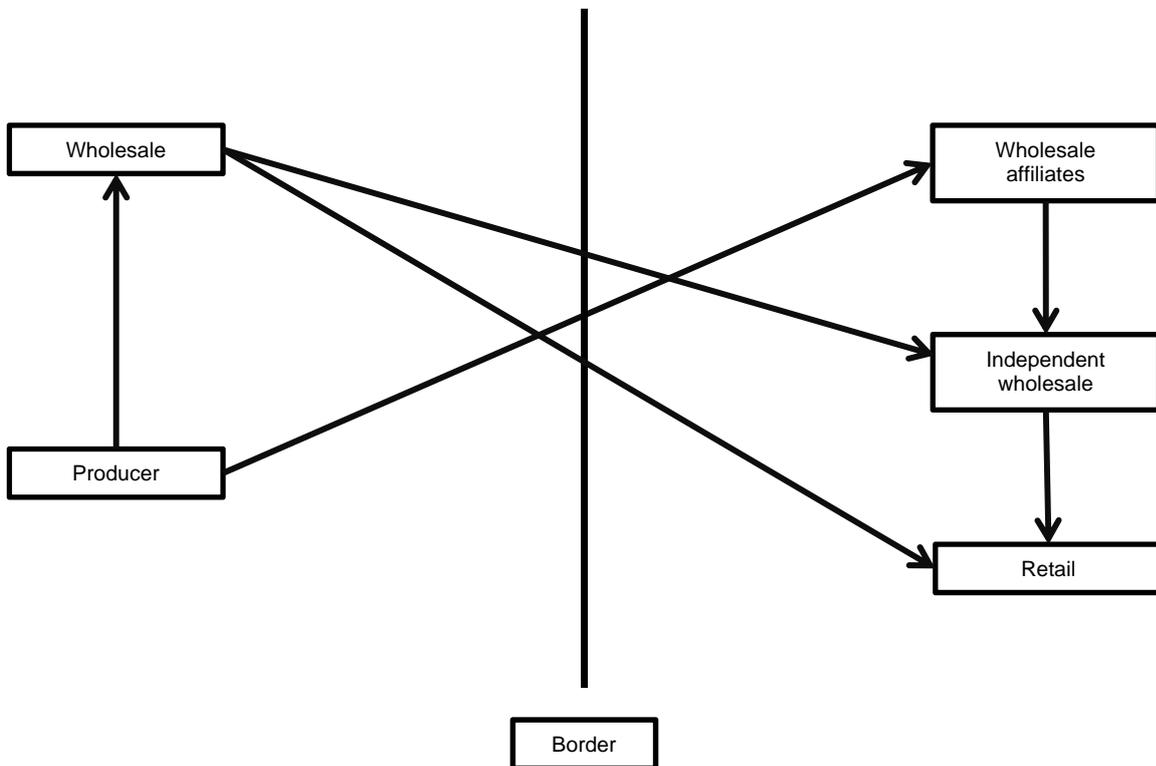
The issue of territorial supply constraints is closely related to the issue of parallel imports. A study on the food value chain (IDEA Consult et al. 2011) indicates the typical pattern of international distribution in food value chains (Figure 34).

**Figure 34 / Value chain without parallel imports**



Source: Own illustration.

**Figure 35 / Value chain with parallel imports**



Source: Own illustration.

Large producers which operate across Europe typically have a few facilities that produce for all EU Member States. The goods are then provided to the national wholesale affiliates of the producer, which further distribute them to national retailers and final consumers.

A food retailer in a country on the right-hand side of the figure would typically buy from a wholesaler, which itself is supplied by the national affiliate of a multinational firm. He would not be able to benefit from a lower price in another EU country.

A different picture emerges when parallel imports – i.e. trade outside the internal channels of a producing multinational company – come into play. Here, wholesale in the target country sources goods not only from the local affiliate of the multinational firm, but also from foreign wholesalers.

A food retailer in a country on the right-hand side of the figure would be supplied by wholesalers and the national affiliate of the multinational firm, but also by wholesalers from abroad; this would enable the retailer to benefit from lower prices in other EU countries.

The second variant seems to be the natural form of organisation of transnational value chains in the single market. However, as the example of the food supply chain (IDEA Consult et al. 2011) shows, it is the exception rather than the rule. Similar evidence exists also for other sectors, for example pharmaceuticals (Prognos 2014).

This example suggests that questions surrounding territorial supply constraints seem important to a better understanding of the functioning of the single market. This point has also been raised by the High Level Group on Retail Competitiveness (2015), which advises the European Commission on the retail trade: the High Level Group sees 'burdensome and fragmented national product labelling rules, as well as other requirements to be met by products imported from other Member States' as a serious obstacle to cross-border trade in the single market. It is noticeable here that the restrictions pointed out by the High Level Group are raised not by enterprises, but by Member States.

Unfortunately, we have not so far found a data source that would allow us to tackle parallel imports. The aforementioned study (IDEA Consult et al. 2011) used a proprietary database compiled by Eurostat.

The basis assumption of this section is that divergence between EU Member States in wholesale productivity and profitability indicates barriers to the completion of the single market in wholesale, while convergence is a sign of progress towards market integration in European wholesale.

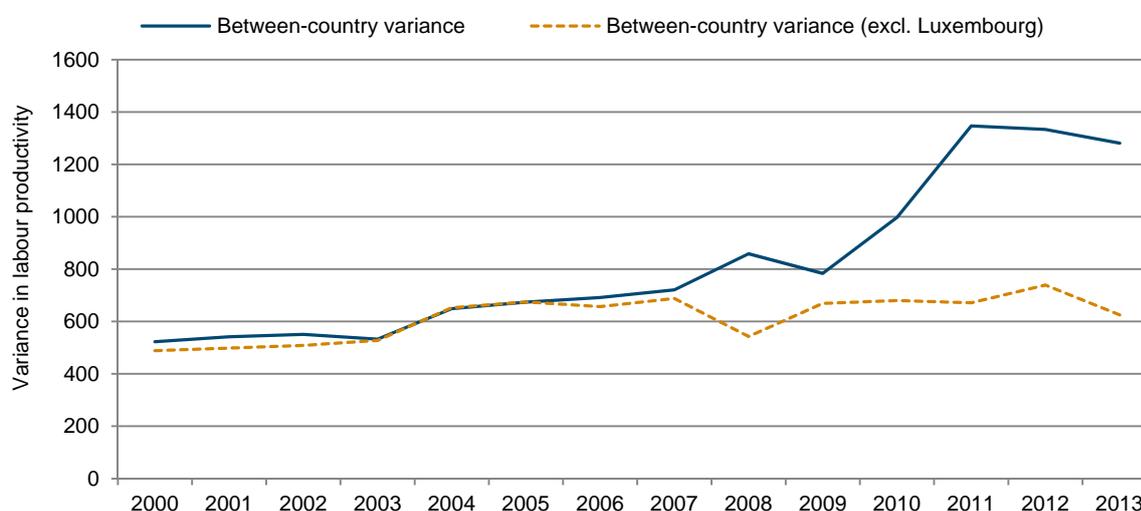
One way of measuring convergence between countries towards an integrated single market is to investigate whether differences in the productivity levels of the EU Member States have widened or decreased over the years. In mathematical terms, we determine the changes in variance or standard deviation between countries over a certain period of time. A decreasing variance/standard deviation would then indicate a reduction in heterogeneity and hence, convergence in productivity.

The issue of productivity convergence in the EU is also interesting from the perspective of Central and Eastern European Member States, which are in the process of catching up. For these countries, convergence would mean a higher growth of productivity compared to the EU average, which would in turn point to the role of wholesale in the catch-up process for these economies. An important mechanism

behind this convergence may be intra-EU knowledge transfer by foreign direct investment, imitation, personnel mobility, etc.

Figure 36 plots the variance in the apparent labour productivity between the EU-28 countries for the years 2000–2013. The total between-country variance including all EU-28 countries (solid line) is gradually increasing over the years, with a jump in 2009–2011. This would fit with the pattern of convergence before the crisis and divergence after the crisis that we also find in GDP per capita and other indicators.

**Figure 36 / Variance in apparent labour productivity between countries for NACE 46, 2000-2013**



Notes: Values for 2000–2007 according to NACE Rev. 1, values for 2008–2013 according to NACE Rev. 2.

Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2 and sbs\_na\_3b\_tr), own calculations.

However, detailed inspection of the data reveals that the increasing variance results from the constantly increasing labour productivity of Luxembourg. Due to the unique role of Luxembourg, we include an additional between-country variance without Luxembourg in the figure (broken line). Excluding Luxembourg results in an almost constant variance of labour productivity over time – before and after the crisis – indicating neither convergence nor divergence between countries.

Another way to show (conditional) convergence between countries is to contrast the countries' growth rates according to a certain indicator over a period of time with their initial values from the beginning of the respective period. We did this in Figure 37 for apparent labour productivity and adjusted the values for the EU-27 value. There, the EU-28 countries (excluding Malta) are plotted according to their:

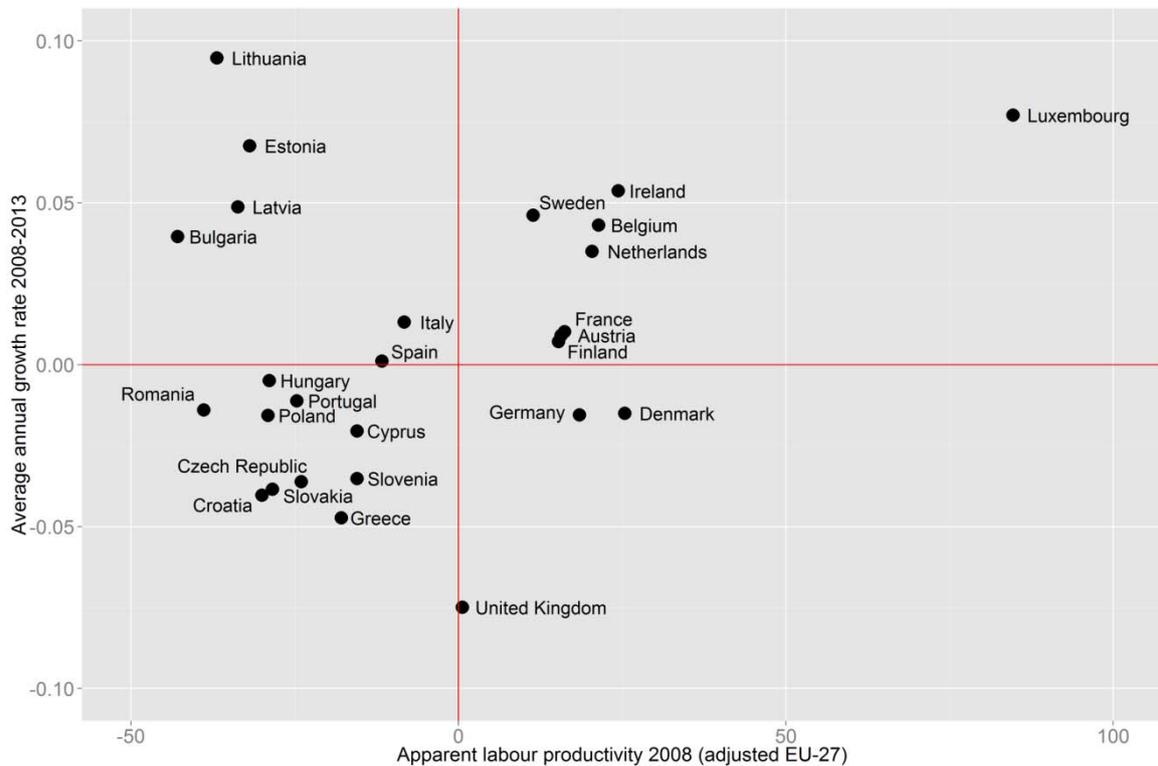
- › **average annual growth rates of labour productivity** in wholesale from 2008 to 2013, and
- › their **initial labour productivity levels** in the year 2008 (adjusted by the EU-27 values for the sake of interpretability).

As a result, the countries can be characterised according to (i) their either positive or negative productivity growth rate, as well as (ii) whether their initial labour productivity was above or below the EU-27 value. This results in four quadrants, two of them – the upper left and the lower right – indicating convergence. Countries in the upper-left quadrant are below the EU average, but are catching up. Countries in the lower-right quadrant are above the EU value and are falling back.

Figure 37 shows nine countries in the two convergence quadrants, and 18 countries in divergence quadrants. The largest convergence group is in the upper-left quadrant, with Lithuania, Estonia, Latvia and Bulgaria. On the one hand, these countries exhibit an initial labour productivity below the EU-27 value, but on the other hand they have positive average annual productivity growth rates, suggesting a catch-up process over time. Indeed, Bulgaria and Lithuania are two of the three countries with the lowest labour productivity in the sector in the EU-28.

Another cluster of ten countries can be observed in the lower-left quarter, including Romania, Hungary, Portugal and Poland. With slower growth and comparatively low productivity in 2008, the countries in this cluster are falling back and diverging relative to the EU value. The same holds true of Germany, Denmark and the United Kingdom. We may therefore assume that the contribution of wholesale to overall productivity development is also low in these countries.

**Figure 37 / Average annual growth and initial apparent labour productivity (adjusted by EU-27 value) for wholesale**



Note: Malta excluded due to lack of data.

Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

Sweden, Ireland, Belgium and the Netherlands, in contrast, are countries with positive productivity growth rates over the past years, as well as a high initial value of productivity. These countries are extending their lead. As already shown above, Luxembourg again holds a unique position, exhibiting a relatively high value of labour productivity in 2008.

In summary, the findings suggest divergence, rather than convergence, between the countries in terms of labour productivity, since the majority of the countries either show low initial productivity and tend to fall back, or exhibit an initial high productivity and further productivity increases over time.

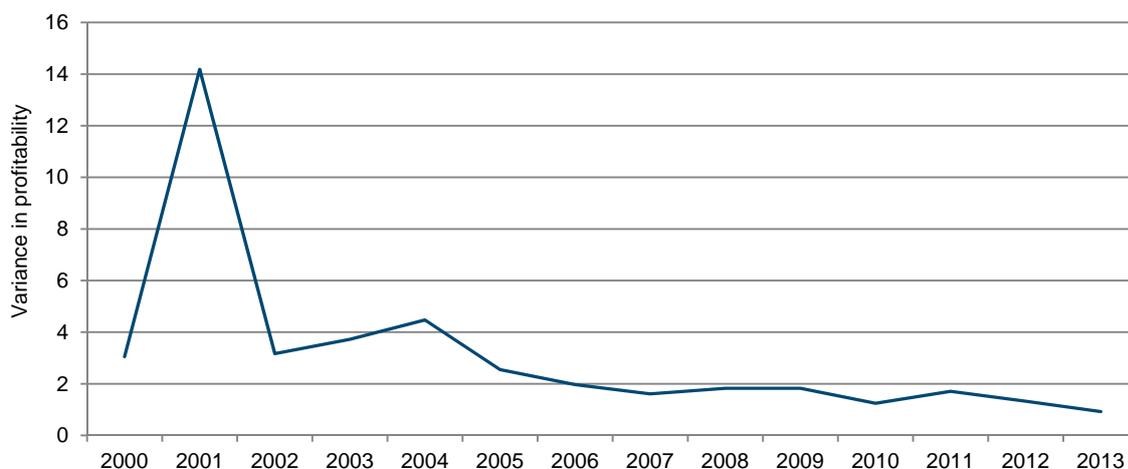
The existence of persistent supernormal profit levels in wholesale at the country level is a second indication that barriers in this sector may exist in the single market. If supernormal profits exist in one country, we would expect wholesale firms from other countries to move into this country, and additional competition would drive profits down.

As stated above, we expect convergence in profitability levels between Member States of the single market over time. To test this assumption, we plot the variance of the gross operating rate between the countries for the aggregated wholesale sector NACE 46 over the past years (see Figure 38).

What is striking is the spike in 2001, which was caused by a very high profitability level in Poland causing a strong increase in variance. Other than that, the variance between the countries has been more or less gradually decreasing over the years. There is no particular difference in this convergence before and after the crisis. In the years following 2008, we see convergence rather than divergence.

We see this trend as evidence of the countries becoming less diverse with respect to profitability levels, and hence evolving towards an integrated single market.

**Figure 38 / Variance in profitability (gross operating rate) between countries for wholesale, 2000–2013**



Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2 and sbs\_na\_3b\_tr), own calculations.

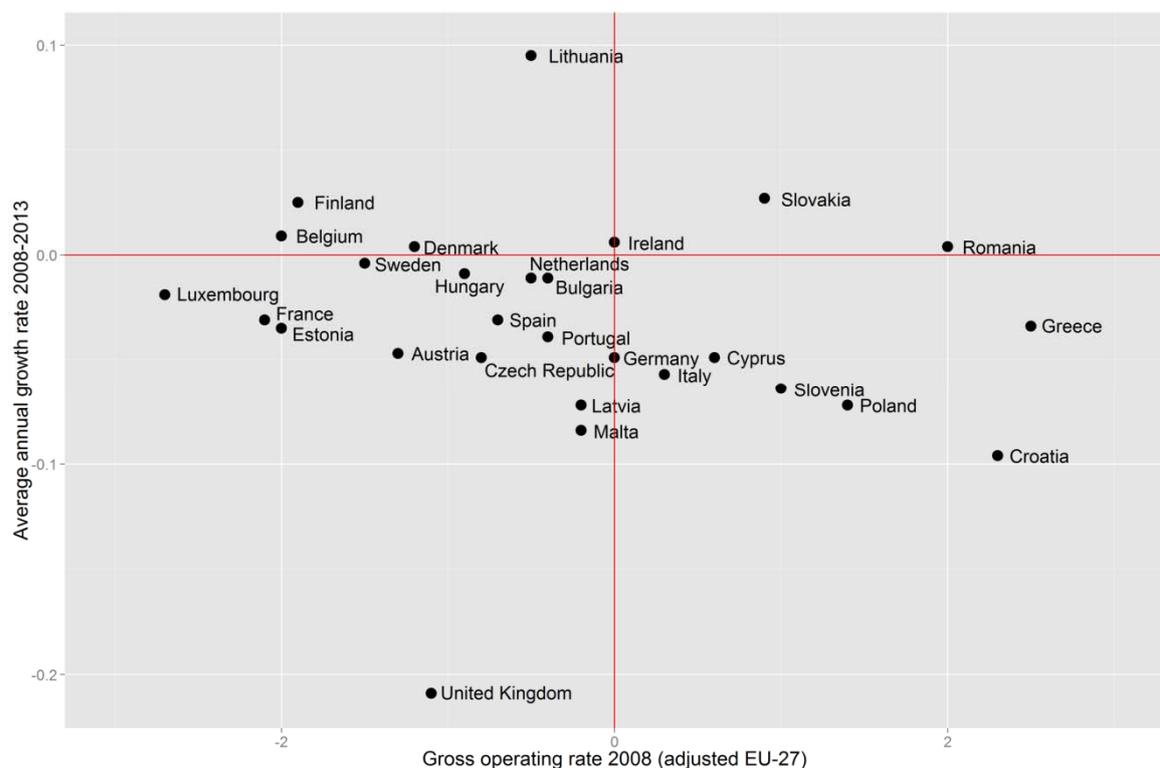
Another perspective on the ongoing convergence in wholesale profitability is shown in Figure 39. Again, we depict the average annual growth rate of profitability over the years 2008–2013 and profitability levels

for the year 2008, adjusted by the value of the EU-27 countries. As in Figure 37, the countries can be characterised according to (i) their positive or negative profit growth rate, and (ii) whether their initial profit was above or below the EU-27 value.

There are two convergence quadrants, one in the upper left and one in the lower right. We find nine of the 27 countries in these convergence quadrants. However, the graph suggests a negative correlation between profitability growth and level of profitability, which may also be seen as a sign of convergence.

Most of the countries are located below the horizontal red line that indicates a zero average annual growth rate of profitability. Hence, they faced overall decreasing profits in the period 2008 to 2013. The countries located in the lower-left quarter (e.g. Luxembourg, France, Estonia) not only exhibit negative average annual growth rates, but in addition they started from a profitability level below the EU-27 value in the year 2008. Thus, these countries are tending to fall back even further. Similarly, Croatia, Greece, Poland, Slovenia, etc. are also falling back, but they started from a higher level of gross operating rate. With the majority of countries showing negative growth rates, convergence rather takes the form of a general falling back.

**Figure 39 / Average annual growth and initial level of profitability (gross operating rate), adjusted by EU-27 value for wholesale**



Note: The gross operating rate of 2008 was adjusted by the value of 2007, since EU-27/28 values for the years 2008–2010 are missing.

Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

Lithuania, Finland, Belgium and Denmark in the upper-left quadrant all exhibit positive average annual growth rates and started at a gross operating rate level below the EU-27 value in 2008. This means that

these countries are catching up in profitability (measured by the gross operating rate). Overall, most countries are located in the lower-left quarter and are hence falling back from an already low level of gross operating rate. Only three countries – Slovakia and (to some extent) Ireland and Romania – are extending their 'lead' with regards to their profit rates.

The UK is an outlier in this figure, with a considerable decrease in profitability over the period 2008–2013. As mentioned before, this is due to the adverse economic development of NACE 46.71, wholesale of solid, liquid and gaseous fuels and related products.

#### **5.4. SUMMARY**

Wholesale firms on average have similar productivity to manufacturing and higher productivity than retail trade. This is a result of lower personnel intensity in the sector. Labour productivity is highest in wholesale of tobacco products and in wholesale of pharmaceuticals.

At the country level, we find the highest productivity in Northern and Western European countries. Lithuania, Estonia, Latvia and Bulgaria are four countries with below-average productivity in 2008, but faster productivity growth in wholesale than the EU average, and so wholesale contributes to the catching up going on there. The majority of Central and Eastern European Member States, however, reveal slower growth and below-average productivity in 2008, and so these countries are falling back and diverging relative to the EU value. For the majority of countries, no convergence with the EU average in wholesale productivity is visible.

Differences between EU Member States in wholesale productivity may point to barriers for the single market in this sector. With respect to productivity, the variation between EU countries is high, with values ranging from about EUR 15,000 per person employed in Bulgaria to over EUR 180,000 in Luxembourg.

Differences in profitability are smaller but still notable. We found convergence in the form of a decreasing between-country variance in the period 2000–2013. However, a comparison of annual growth rates and initial profitability suggests that this convergence is due to the fact that the majority of countries are going backwards.

We have seen divergence rather than convergence in wholesale labour productivity since 2008. In terms of profitability, the decreasing between-country variance in 2000–2013 suggests convergence. However, a comparison of annual growth rates and initial profitability indicates that this convergence is the consequence of most countries falling back rather than catching up.

Divergence can partly be explained by differences in the sectoral composition of wholesale in various European countries. However, the levels of divergence also indicate that barriers to market integration still exist. The existence of barriers – for example, measures by producers to limit parallel imports – has been confirmed by previous studies on wholesale sub-sectors (IDEA Consult et al. 2011). Another potential barrier is national regulation, as pointed out by the case study at the end of this report. It is, however, not possible in this study to investigate the types of barriers or to investigate in which sub-sectors these barriers are most relevant.

## 6. The role of foreign-owned firms in wholesale

Evidence presented in previous sections suggests that there are at least three different forms of wholesale firms existing together in the EU: wholesale affiliates of foreign multinationals, which act as the general distributor for their company in a particular country; wholesale divisions of retail firms organised as independent companies; and finally independent wholesalers.

To investigate the role of affiliates of foreign multinational firms in more detail, we employ data from the Eurostat database on foreign affiliates (FATS). In the context of FATS, the term 'foreign-owned' means that the firm is affiliated to a parent company which is situated outside the country of residence of the firm, but not necessarily outside the EU. So the affiliate of a French firm in Spain is considered to foreign-owned according to FATS.

Among other things, inward FATS<sup>2</sup> delivers information on (i) the number of foreign-controlled enterprises, (ii) the number of persons employed and (iii) value added at factor cost of foreign affiliates. Readers should note that this is not a comparison of multinational companies, but rather an analysis of their affiliates in different European countries. The literature assumes that subsidiaries of multinational companies often perform better than domestically owned firms on many indicators, mainly because of selection and superior assets (Bellak 2004; Dunning and Lundan 2008).

### 6.1. THE SHARE OF FOREIGN-OWNED FIRMS IN EUROPEAN WHOLESALE

In the last 20 years, the European economies have become increasingly internationalised. On the one hand, this is a result of Europe's integration in the single market, which raised foreign direct investment between EU Member States; on the other hand, the European Union has also attracted many firms from outside Europe, mainly the United States.

The table below shows the degree of internationalisation in wholesale, and compares it with retail trade and manufacturing. Compared to both sectors, wholesale is the most internationalised sector in terms of the share of foreign-owned firms among total firms in the sector and in terms of value added.

**Table 11 / Share of foreign-owned firms in wholesale, retail trade and manufacturing, 2013**

NACE	Sector	Share of no. of firms	Share of persons employed	Share of value added
46	Wholesale trade	3.5%	19.8%	35.0%
47	Retail trade	n/a	14.1%	19.9%
10-33	Manufacturing	2.0%	24.4%	32.3%

Note: EU-28 value for retail trade is confidential.

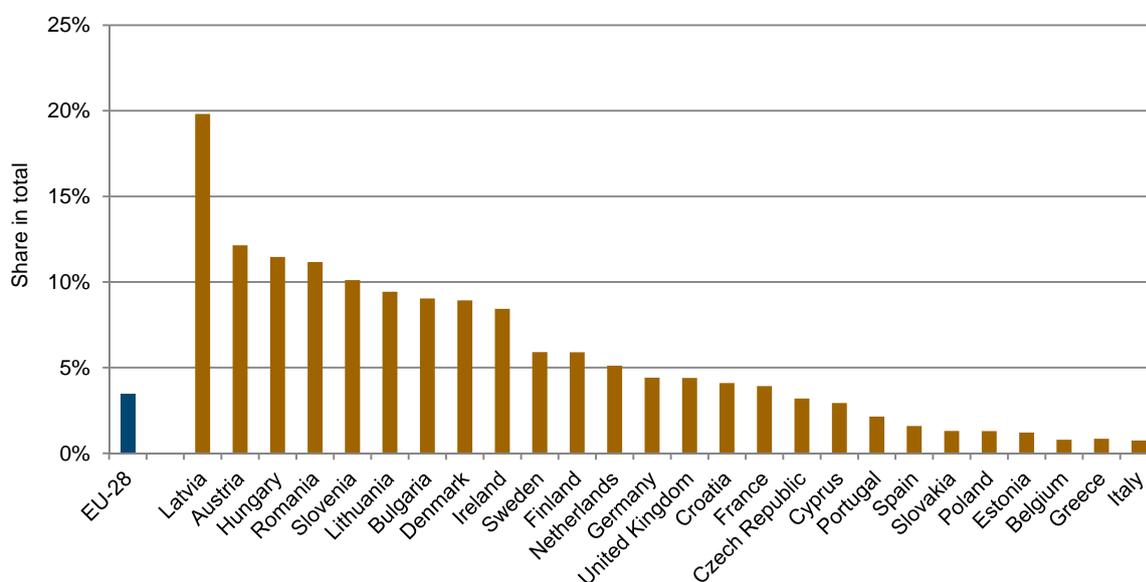
Source: Eurostat, FATS (fats\_g1a\_08), own calculations.

<sup>2</sup> Inward FATS describe the overall activity of foreign affiliates resident in the compiling economy (Source: [http://ec.europa.eu/eurostat/cache/metadata/en/fats\\_esms.htm](http://ec.europa.eu/eurostat/cache/metadata/en/fats_esms.htm)).

This high degree of internationalisation in wholesale provides a reason to take a closer look at the role of foreign-owned firms in the sector. In Figure 40, we illustrate the shares of foreign-owned enterprises in the wholesale sector, i.e. the number of foreign-controlled enterprises as a proportion of the total number of enterprises active in different EU Member States.

With almost 20%, Latvia exhibits by far the highest share of foreign-owned enterprises. It is followed by Austria and Hungary, with 12% and 11% of their enterprises in the wholesale sector foreign-owned. Thirteen countries have values of below 5%; moreover, Italy, Greece, Estonia, Poland and Slovakia have negligible shares – below 1.5%. In general, larger countries reveal lower shares of foreign firms than smaller countries. The size of Italy is also the reason for the low value of the EU-28 aggregate.

**Figure 40 / Shares of foreign-owned enterprises in the total firm population in NACE 46, 2013**



Notes: Excluding Luxembourg and Malta due to lack of data; Ireland and Cyprus shares for 2012.

Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2) and FATS (fats\_g1a\_08), own calculations.

In Figure 90 in the Annex we repeat this ranking at the level of NACE 3-digit sub-sectors of wholesale. The result is largely consistent with the aggregate NACE 2-digit level – with one exception: in five of the eight sectors where we have data for Luxembourg, it has by far the highest share of foreign-owned firms in wholesale. This shows once again Luxembourg's role as a favourite place for the location of affiliates of foreign multinational firms.

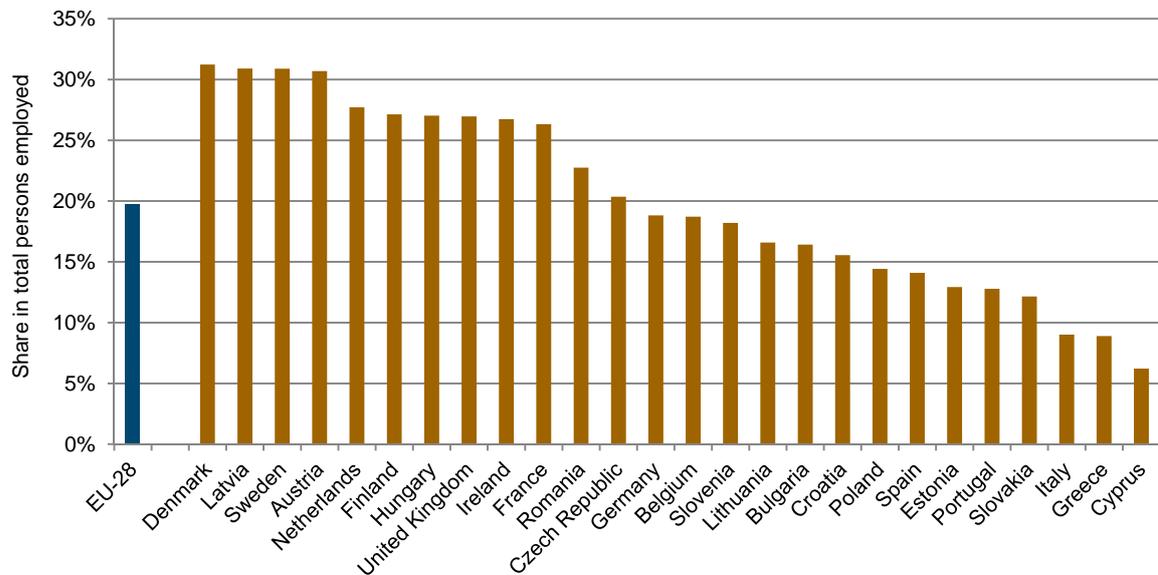
Moreover, in all sub-sectors, Latvia, Austria and Hungary are among the countries with the highest share of foreign-owned firms in the firm population of the sub-sector – or are at least in the upper half of the distribution of countries. Italy, Estonia and Greece are most often at the bottom of the distribution.

The sub-sector with the highest share of foreign-owned firms in the firm population is wholesale of information and communication equipment, which reflects the international orientation of this sector and the weight of non-European firms in this sector.

The shares of foreign-owned enterprises in terms of persons employed in the wholesale sector are plotted in Figure 41, while Figure 42 shows the change in this employment share between 2008 and 2013. Overall, the shares of foreign-owned enterprises in employment are higher than the shares in the firm population seen in Figure 40. This suggests that foreign-owned enterprises are larger than domestically owned enterprises, which is also supported by the literature (Bellak 2004).

Denmark, Latvia, Sweden and Austria all have shares of above 30%. For Latvia and Austria, this comes as no surprise, since these countries also exhibited the highest shares of foreign-owned enterprises, as illustrated above. However, in the case of Sweden and Denmark, with about 6% and 9% of enterprises in the observed sector foreign-owned, over 30% of employees are engaged in such enterprises. Italy and Greece, both countries with shares of below 10%, hold the smallest values of the countries illustrated.

**Figure 41 / Shares of foreign-owned enterprises in terms of persons employed in wholesale, 2013**



Notes: Excluding Luxembourg and Malta due to lack of data; Ireland and Cyprus shares for 2012.

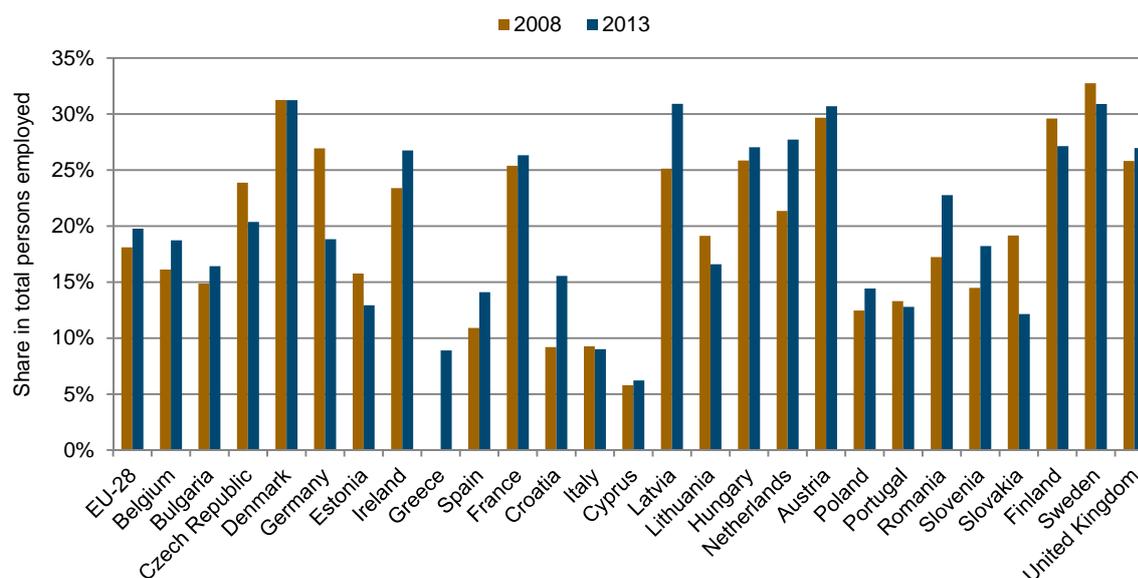
Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2) and FATS (fats\_g1a\_08), own calculations.

The employment share of foreign-owned firms has increased in wholesale for the EU-28 and also in most Member States (Figure 42). The greatest increase – from 9% to more than 15% – can be found in Croatia, which may be related to Croatia's accession to the European Union, which made the country more attractive to foreign investment. The employment share has decreased in Germany and Slovakia.

The distribution of employment across domestically owned and foreign-owned firms at the sub-sector level largely reflects the distribution at the aggregate level (Figure 91 in the Annex). Again, we find Denmark, Latvia and Austria among the most internationalised countries here. Some countries show notably higher shares of foreign ownership in wholesale in some sub-sectors than at the aggregated sector level. Examples are Romania in wholesale of agricultural raw materials, France in wholesale of household goods and information and communication equipment, and Cyprus in wholesale on a contract

and fee basis. Once more, we also need to point out Luxembourg. Although there are no data available on the aggregated sector level of NACE 46, values for the sub-sectors NACE 46.2 (wholesale of agricultural raw materials and live animals), NACE 46.4 (wholesale of household goods), NACE 46.7 (other specialised wholesale) and NACE 46.9 (non-specialised wholesale trade) are provided. In each of these sub-sectors, Luxembourg has the highest share of foreign ownership.

**Figure 42 / Change in the share of foreign-owned enterprises in terms of persons employed in wholesale, 2008–2013**

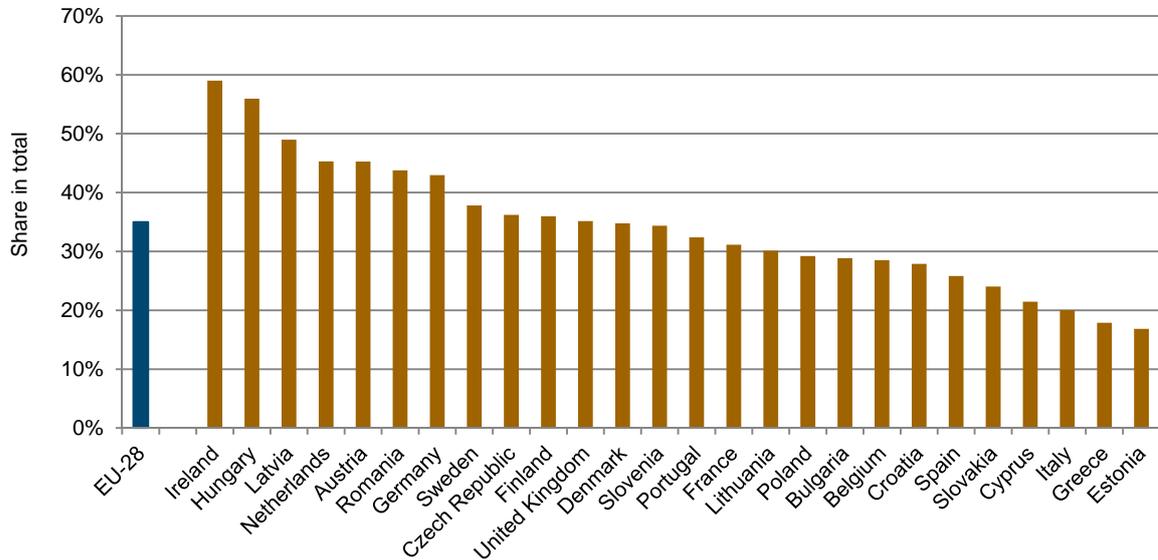


Notes: Excluding Greece, Luxembourg and Malta due to lack of data; for 2008 values: EU-28 and Cyprus shares for 2009, France shares for 2010; for 2013 values: Ireland and Cyprus shares for 2012.

Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2) and FATS (fats\_g1a\_08), own calculations.

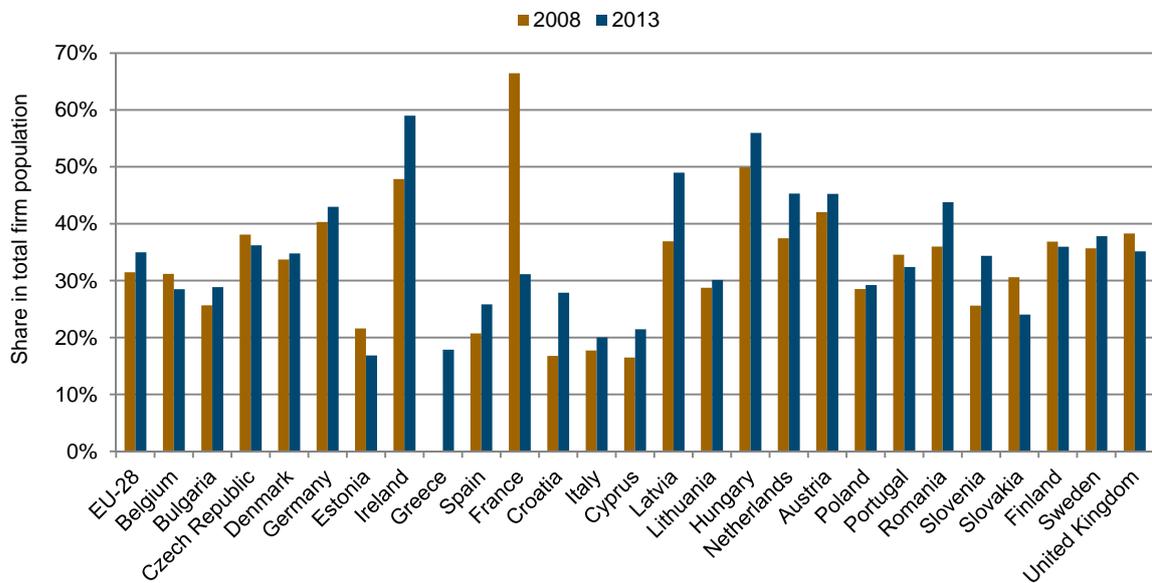
One sub-sector that stands out is NACE 46.5 (i.e. wholesale of information and communication equipment) which has the highest share of persons employed by the affiliates of foreign multinationals. In 11 countries (Denmark, Germany, Greece, Spain, France, Lithuania, Hungary, the Netherlands, Austria, Portugal and Romania) this is the sub-sector with the strongest presence of foreign-owned firms in wholesale and the highest share of persons employed by foreign-owned enterprises. In Denmark, France, Hungary and the Netherlands, more than half of those employed in this sub-sector are employed in foreign-owned enterprises. Only non-specialised wholesale trade in the Netherlands and Luxembourg has similar shares of foreign ownership.

As a third characteristic, the share of foreign affiliates in terms of value added at factor cost is displayed in Figure 43. In Ireland and Hungary, over 50% of the value added in wholesale is generated by foreign-owned enterprises. Countries where the share of foreign-owned firms is over 40% include Latvia, the Netherlands, Austria, Romania and Germany. Even the countries with the lowest shares of value added, Estonia and Italy, still exhibit values of 17% and 20%. This means that the economic significance of foreign-owned firms is much larger than the share of the firm population would suggest.

**Figure 43 / Shares of value added of foreign-owned enterprises in wholesale, EU-28, 2013**

Notes: Excluding Luxembourg and Malta due to lack of data; Ireland and Cyprus shares for 2012.

Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2) and FATS (fats\_g1a\_08), own calculations.

**Figure 44 / Change in the shares of foreign-owned enterprises in terms of value added in wholesale, 2008–2013**

Notes: Excluding Greece, Luxembourg and Malta due to lack of data; for 2008 values: EU-28 and Cyprus shares for 2009, France shares for 2010; for 2013 values: Ireland and Cyprus shares for 2012.

Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2) and FATS (fats\_g1a\_08), own calculations.

Value added by foreign-owned firms increased faster than value added of domestically owned firms between 2008 and 2013. As a result, we see a higher share of foreign-owned firms in 2013 than in 2008. Most noticeable are the increases in Ireland, Latvia and Romania. The largest decrease by far is in

France. The data indicate a value added of foreign-owned firms of EUR 51.8 billion in France in 2008, but only EUR 22.4 billion in 2009. Eurostat receives FATS data from national statistical offices, and so there may be a data error on the part of the French National Institute of Statistics and Economic Studies; however, there remains the possibility that this development is the result of a huge acquisition of foreign-owned firms by a French company in 2008. However, we could not find an acquisition in wholesale so large that it could move EUR 30 billion of value added.

Again, a look at the sub-sector level (Figure 92 in the Annex) reveals the unique position of the sub-sectors NACE 46.5 (wholesale of information and communication equipment) and NACE 46.4 (wholesale of household goods). Wholesale of information and communication equipment is the only wholesale sub-sector where most (62%) of value added is generated by foreign-owned firms. In eight of the 19 countries where data are available, foreign-owned firms generate more value added in this sub-sector than their domestic competitors.

All countries observed, with the exception of Bulgaria, have the highest share of foreign ownership in one of these two sub-sectors. Moreover, for Germany, Hungary and the Netherlands, the value added of foreign-owned enterprises accounts for over 73% of the total value added in the sector NACE 46.5.

## 6.2. PRODUCTIVITY AND PROFITABILITY OF FOREIGN-OWNED FIRMS IN EUROPEAN WHOLESALE

To shed light on the relevance of foreign-owned enterprises in the business economy, the productivity (measured by apparent labour productivity) and profitability (measured by gross operating rate) of foreign-owned enterprises are compared to those of all enterprises in wholesale, as published in the Eurostat Structural Business Statistics (SBS) database.

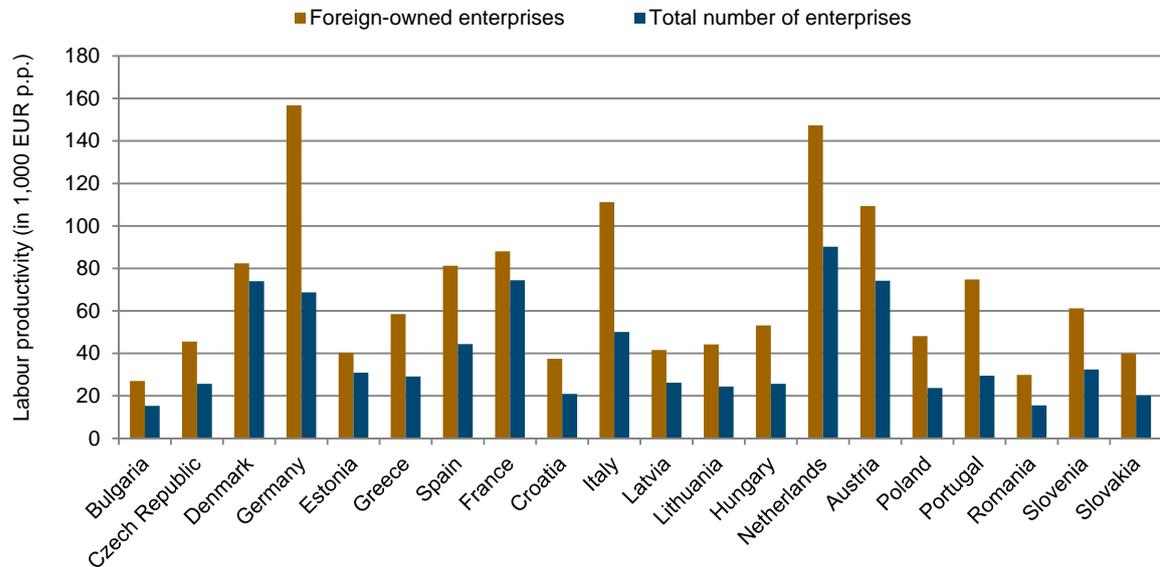
Figure 45 shows a comparison of apparent labour productivity (for the EU-28 countries with available data in both sources). Without exception, labour productivity in the foreign-owned enterprises is higher than in the total enterprise sector. The differences are greatest for Germany (EUR 88,100 p.p.), Italy (EUR 61,100 p.p.) and the Netherlands (EUR 57,100 p.p.). In fact, these countries are also those with the highest productivity of foreign-owned enterprises. By contrast, Bulgaria, Romania, Croatia and Slovakia are the countries with the lowest productivity in both domestically owned and foreign-owned firms. We also see a strong correlation between the productivity of foreign-owned firms and total productivity: in countries with low productivity of wholesale, foreign-owned firms also have lower productivity.

This pattern can also be found at the sub-sector level (Figure 93 in the Annex). With only very few exceptions, foreign-owned firms are more productive than domestically owned firms in all countries and in all NACE 3-digit sub-sectors. This means that the differences in productivity between the two groups at the aggregate level are not due to a higher share of foreign-owned firms in the sectors with the highest productivity, but are rather a result of more genuine advantages on the part of foreign-owned firms, such as superior products, brands, knowledge, management capabilities, etc.

The largest gap between domestically owned and foreign-owned firms is found in wholesale of food, beverages and tobacco in the Netherlands. Other wholesale trade in Luxembourg shows by far the

highest value for both foreign-owned and domestically owned firms. We showed above that this is due to a very small number of trading firms with very high value added, but very few employees.

**Figure 45 / Comparison of apparent labour productivity in NACE 46, 2013**

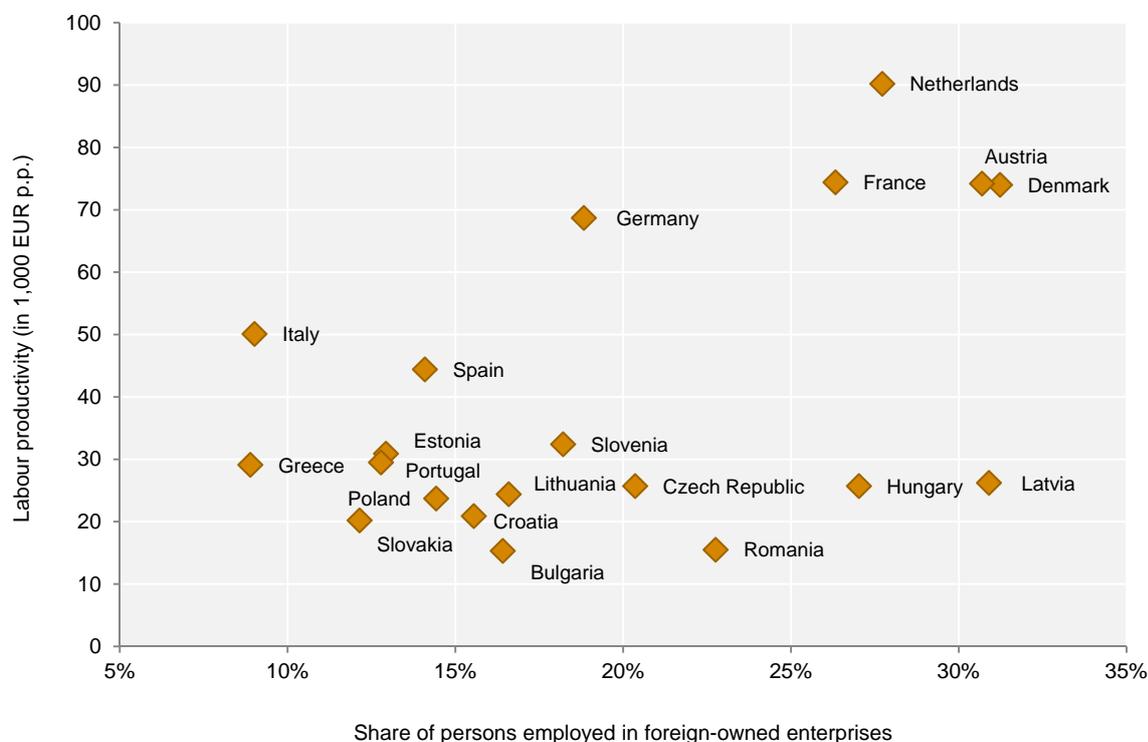


Notes: Excl. Belgium, Ireland, Cyprus, Luxembourg, Malta, Finland, Sweden and the United Kingdom due to lack of data.  
Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2) and FATS (fats\_g1a\_08), own calculations.

Finally, can foreign ownership explain productivity differences between countries in wholesale? This idea is backed by the literature, because the international economics literature stresses the fact that foreign-owned firms, on average, are more productive than domestically owned firms (Bellak 2004). A high share of foreign-owned firms may therefore raise overall productivity. This effect, however, comes to a considerable degree from the fact that multinational firms most often operate in sectors with high productivity; so this relationship may disappear when we look at wholesale alone. Moreover, foreign investment may also be attracted to the most productive locations.

We illustrate the relationship between foreign ownership and productivity in the wholesale sector for a sample of countries in Figure 46. We immediately identify two clusters of countries. There is one high-productivity group that is also very internationalised; it includes the Netherlands, France, Austria and Denmark. Another group, with lower productivity and a lower share of foreign ownership, includes some Eastern and Southern European countries. Moreover, there are some outliers – most notably Latvia and Hungary, but also Germany, which have too high or too low shares of foreign ownership compared to their productivity levels. Altogether, there is a correlation between the two variables of 0.24, which indicates a moderate positive relationship.

**Figure 46 / Relationship of labour productivity and the share of foreign-owned firms among persons employed in NACE 46, 2013**



Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2) and FATS (fats\_g1a\_08), own calculations.

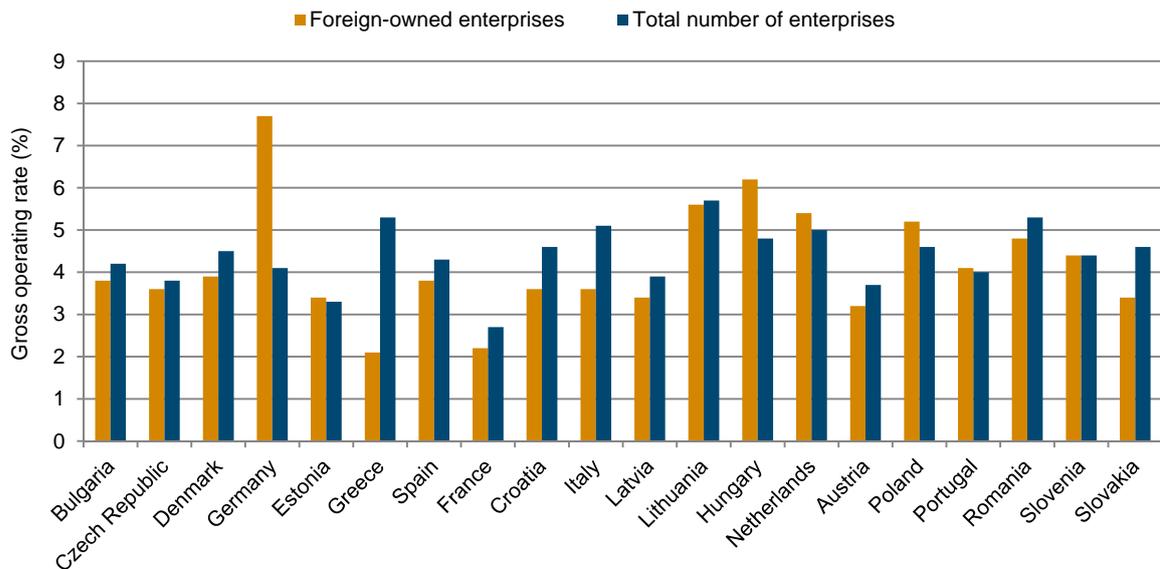
In contrast to productivity, a comparison of profitability (gross operating rate) does not show any general superiority of foreign-owned firms (Figure 47). Foreign-owned firms exhibit lower profitability in the majority of countries (13 out of 19). An indicative example is Greece, where we can observe the largest difference between foreign-owned firms and the total firm population. Germany, on the other hand, is an obvious example of higher profitability among foreign-owned firms, and it also shows the largest gaps between the two groups. While Germany has the highest profit rate in this category, the lowest levels of profitability are found in Greece (2.1%), France (2.2%) and Austria (3.2%).

Foreign-owned firms in Greece are among those firms with the lowest profitability in most sub-sectors. The result for Austria can be explained by very low profitability in two sub-sectors: wholesale of information and communication equipment and non-specialised wholesale. The superior profitability of foreign-owned firms in Germany, by contrast, is a result of their superior performance in a number of sub-sectors, including wholesale of food, beverages and tobacco, wholesale of household goods, wholesale of information and communication equipment and wholesale of machinery. There is no general superiority of foreign-owned firms at the sub-sector level.

These apparent divergences between productivity and profitability are surprising, given that the two variables seem to be related: more efficient firms tend to be more profitable, and differences in productivity set the stage for differences in profitability (Bottazzi et al. 2008). It is therefore a confusing result that foreign-owned firms have broadly similar profitability to the total enterprise population, but reveal much higher productivity. Dunning and Lundan (2008: 525) provide some possible reasons for

this, including the manipulation of transfer prices in intra-firm transactions, or deliberate use of intra-MNE financial leverage to alter costs. In addition, the data reveal that, compared to foreign-owned firms, domestically owned firms have considerably higher personnel intensities, which drive productivity down.

**Figure 47 / Comparison of the gross operating rate (profitability) in NACE 46, 2013**



Notes: Excl. Belgium, Ireland, Cyprus, Luxembourg, Malta, Finland, Sweden and the United Kingdom due to lack of data.  
Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2) and FATS (fats\_g1a\_08), own calculations.

### 6.3. SUMMARY

To sum up, foreign ownership is a key determinant of firm performance in wholesale: wholesale firms owned by foreign multinationals tend to be larger than their domestically owned competitors. Foreign-owned firms account for only around 3% of all wholesale firms, but for 18% of employment and 35% of value added in the sector. They reveal higher productivity in all countries and in all sub-sectors, which makes foreign investment in wholesale a potential driver of productivity growth.

Foreign ownership in wholesale is growing across the EU Member States, which reflects the attractiveness of the EU. We find the highest shares of foreign ownership in wholesale of communication and information equipment, in the wholesale of household goods and in the wholesale of machinery. Wholesale on a fee and contract basis and wholesale of agricultural raw products, in contrast, are largely dominated by domestically owned firms.

## 7. The role of technology and innovation in wholesale

The following sections look at various topics related to technology and innovation in wholesale. We start with a discussion of disintermediation in wholesale – closely linked to the diffusion of e-commerce, which allows producers to sell direct to industrial and final customers.

### 7.1. DISINTERMEDIATION

Different streams of literature anticipate disintermediation, due to the wider diffusion of e-commerce technologies that render wholesalers dispensable (Bernardo 2013). Disintermediation occurs when the ‘middlemen’ – e.g. intermediaries, wholesalers – are removed from the supply chain (Chircu and Kauffman 1999). Disintermediation covers different aspects of vertical integration, e.g. when the supplier internalises activities that were traditionally performed by intermediaries (Sarkar et al. 2006) or when buyers gain increased knowledge of supply pricing and hence buy direct from the producer (Picot and Bortenlanger 2006). However, despite the expectation that e-commerce will cause a revolution in traditional trading behaviour (PricewaterhouseCoopers 2016), the wholesale sector appears to be stable, employing around 10 million people in the EU-28.

The issue of disintermediation is treated in the B2B literature, which seeks to provide an understanding of the adoption and routinisation processes of **e-commerce technologies** in different (wholesale) firms and, based on this, in different (clusters of) countries. In this stream of literature, disintermediation is seen as a trend that is strengthened by increased market transparency, which also intensifies competition. Innovative information aggregators facilitate comparison in the purchasing process. Others proactively monitor supplier activity and make the information available, thus making it easier for retailers to connect directly with manufacturers. The consequence is **disintermediation**, as retailers are able to go direct to manufacturers and manufacturers are able to go direct to consumers. Greater transparency thus enables the deconstruction of the value chain and the entry of new competitors. The most likely result is reduced margins, as intermediaries are caught between product costs and competitors, where customers in weak markets are unwilling to accept price increases (Elms 2013).

This is the common view, which does not, however, take account of the fact that a decline in wholesaling due to disintermediation cannot be perceived in statistical indicators. There are indeed some single areas of wholesale where a decrease in employment may be related to more competition from the Internet – most notably in NACE 46.43, wholesale of electrical household appliances.

Altogether, however, wholesale has recovered after the crises of 2008 and 2010; employment in 2013 is about the same level as employment in 2008, turnover in 2013 – after a decline in 2009, has recovered to slightly above the 2008 level, and the number of enterprises has risen (see this report).

For the purposes of this project, we now present empirical analyses in the literature which try to explain why wholesaling as a sector seems unaffected, despite all the prophecies of doom.

What we have found are studies of sub-sectors of wholesale and retail, e.g. travel agencies, pharmaceuticals, etc. These studies attempt to explain why disintermediation may sometimes not attain the speed expected – or may even result in re-intermediation after a trial period. Although the particular sub-sectors are not at the focus of our study here, we may derive general arguments and discussions from them which are also relevant in the context of this project. The main discussion points are summarised below.

What counteracts disintermediation? On the whole, disintermediation processes are counteracted by associated developments that partly or wholly compensate each other: Buhalis and Kaldis (2008) observe for the markets of hotels and travel agencies that on the one hand, providers now have the opportunities and tools to promote their products direct to the consumers, thereby reducing their dependence on intermediaries (disintermediation). On the other hand, a wide range of intermediaries have emerged (re-intermediation), enabling providers to extend their reach and to promote their services globally (Buhalis and Kaldis 2008). Traditional intermediaries have also introduced websites to gain from the opportunities of the internet, all with the objective of transacting business directly with the customer. They have also established electronic links with other players, such as internet portals and complementary suppliers, feeding them with content and products and supporting a B2B2C marketplace. But also pure electronics intermediaries have emerged to provide a 'one-stop shop' for consumers, hence propelling re-intermediation (Buhalis and Kaldis 2008).

What are the advantages of different distribution channels? Amrouche and Yan (2015) discuss why a manufacturer should bother to use two distribution channels at the same time – traditional wholesalers and retailers plus the internet – particularly considering the various advantages of the internet, like accessibility, fast response to consumers, low distribution costs, quick shipping, etc. On the one hand, using only the internet may have many advantages, but it is not obvious at the moment that the internet will perform all the functions of traditional stores, like building brand and product awareness. On the other hand, using only traditional distribution channels robs the manufacturer of all the possibilities of the internet technologies. Hence the conclusion of Amrouche and Yan (2015): manufacturers have to engage in active channel management and have to make strategic decisions in order to avoid frustration resulting from channels cannibalising each other.

Not all products are equally suited to be sold online. Product compatibility with the web is therefore a key characteristic that impacts on the decisions on how to sell and purchase products (Amrouche and Yan 2015). It is a particular feature of traditional intermediaries that there is human interaction between customers and, for example, travel agencies (Law et al. 2015). The need for interaction is particularly salient in certain customer segments and for certain products, especially multi-faceted complex products and services, which need consultation services (Law and Wong 2003; Grønflaten 2009; Del Chiappa 2013; Law et al. 2015).

Fairness and the internet? The pharmaceutical industry is characterised by several developments: in the United States there are large pharmacy chains, such as CVS Pharmacy, Walgreens and Rite Aid, that are now developing their own warehouses and buying direct from manufacturers, thus bypassing the wholesalers. Secondly, the increase of mail-order pharmacies, where consumers buy direct from the

manufacturers, also poses challenges to wholesalers. Thirdly, pharmaceutical manufacturers are trying to bypass the wholesalers by using third-party logistics companies.

These trends are putting pressure on wholesalers. But fairness is a constant issue in the pharmaceutical industry. A study by Jambulingam et al. (2009) confirms the importance of both procedural and distributive aspects of fairness on the part of pharmaceutical wholesalers, as perceived by the pharmacies. Each aspect of fairness plays a more prominent role in fostering a particular type of trust, which, in turn, leads to loyalty.

Kumar et al. (1995) tested the concept of fairness in the marketing channels literature in the automotive dealer (buyer)–manufacturer (supplier) context. This research has shed new light on the important role that distributive and procedural fairness plays in channel relationships. Kumar et al. (1995) defined distributive fairness as ‘a firm’s comparison of its actual outcomes to those outcomes the firm deems it deserves’. Procedural fairness refers to ‘the buyer’s perception of the fairness of the supplier’s procedures and processes in relation to its buyers’. The fairness of a party’s procedures and policies is assessed by the following six factors: (1) the willingness of a partner to engage in two-way communications (bilateral communication); (2) treating partners equitably by offering equitable opportunities (impartiality); (3) allowing a decision to be appealed at a higher level in a company (refutability); (4) providing partners with a coherent rationale of its policies and procedures (explanation); (5) being aware of the conditions under which the partners operate (familiarity or knowledgeability); and (6) treating partners with respect (courtesy) (Kumar 1996; see also Jambulingam et al. 2009: 4).

Is the literature on disintermediation balanced? Despite the existence of literature pertinent to disintermediation, two apparent research gaps can still be identified. First, the recent literature on disintermediation in hospitality and tourism is overwhelmed by the perspectives of consumers (Grønflaten 2009; Del Chiappa 2013; Law et al. 2015). This leads to the conclusion that scholarly attention on the perspectives of suppliers and intermediaries over disintermediation is limited (Law et al. 2015: 435).

## 7.2. E-COMMERCE

Another important argument that may explain why disintermediation does not take place is that wholesale firms themselves already generate considerable turnover from e-commerce. In the following, we present data on online selling in the wholesale and retail sectors. The data come from the e-commerce statistics of Eurostat and are the result of a joint survey by national statistical offices in Europe on ‘ICT usage and e-commerce in enterprises’. The data include only firms with 10 or more persons employed.

E-commerce is defined here as the trading of goods or services over computer networks such as the internet. It can be divided into e-commerce sales (e-sales) and e-commerce purchases (e-purchases) according to the way in which an enterprise receives or places orders (Eurostat 2015).

Specific methods for e-sales enable the ‘sales process’ to take place in a faster and more efficient manner. These methods can be broadly divided into web sales and electronic data interchange (EDI)-type sales, referring to the way in which customers – private or business – place orders for the products

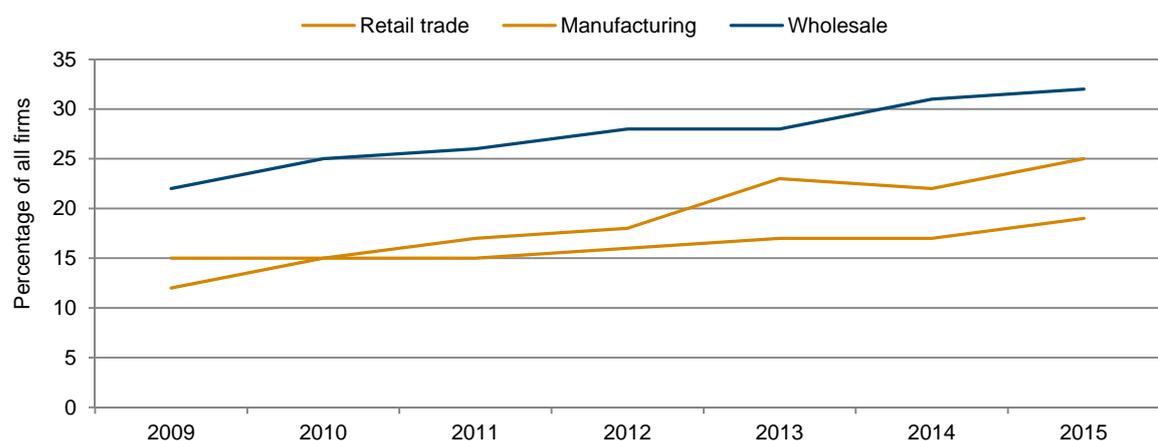
that they wish to purchase. Therefore, for the survey on 'ICT usage and e-commerce in enterprises', respondents were asked to state whether they received orders via a website (web sales) or in a format that allowed automated processing (EDI-type sales) using EDI or Extensible Markup Language (XML) format, for example (Eurostat 2015).

Figure 48 shows the share of firms in different sectors which have received orders over the internet or other computer networks. It gives a first indication of why disintermediation does not take place to the extent expected: increasing proportions of firms sell their products via the internet – in manufacturing as well as in wholesale and retail. The share of firms in wholesale which are active in e-commerce is even larger than in manufacturing and retail trade.

This is also confirmed by national statistics. A report by the UK Office of National Statistics (ONS 2015) shows that the bulk of the UK's e-commerce turnover – GBP 227 billion out of GBP 573 billion – is generated by the wholesale sector. This is considerably more than e-commerce turnover by manufacturing (GBP 152 billion) and retail (GBP 36 billion).

The increase in e-commerce seems to take place in parallel in the different sectors. And probably further increases in sales via the internet are possible in manufacturing, wholesale and retail without the sectors cannibalising each other. The time span covered by the figure is roughly the same period as consumers have accessed the internet via wireless devices, which is certainly a powerful driver of sales via the internet in general.

**Figure 48 / Share of enterprises which have received orders via computer networks in different sectors, EU-28, 2009–2015**

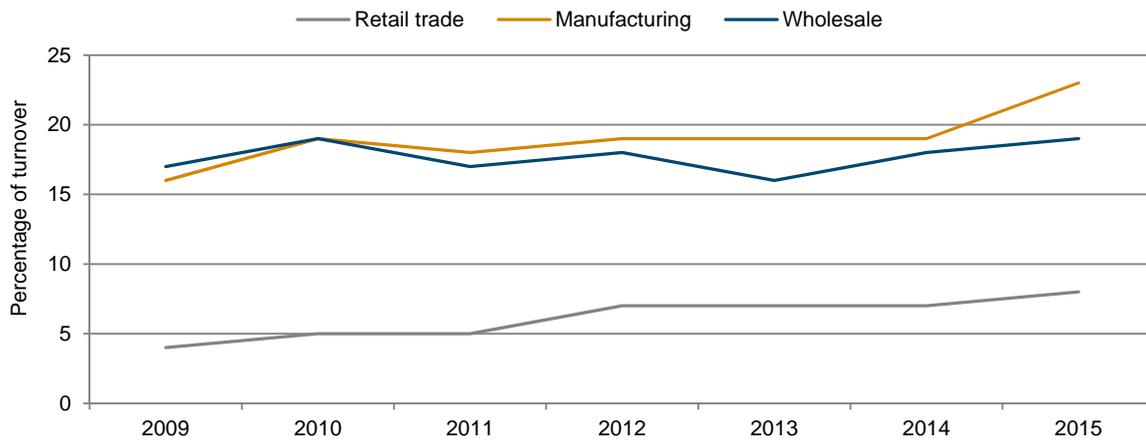


Source: Eurostat, e-commerce statistics.

Wholesale firms in the EU-28 already gain considerable economic benefit from e-commerce, as can be seen from Figure 49. Wholesale firms with 10 or more persons employed generate on average 19% of their turnover from e-commerce; this is only slightly less than the share for manufacturing firms. Compared to retail trade, wholesale seems to be more advanced in terms of e-commerce utilisation, maybe also because the ICT readiness of firms – compared to private households – is higher.

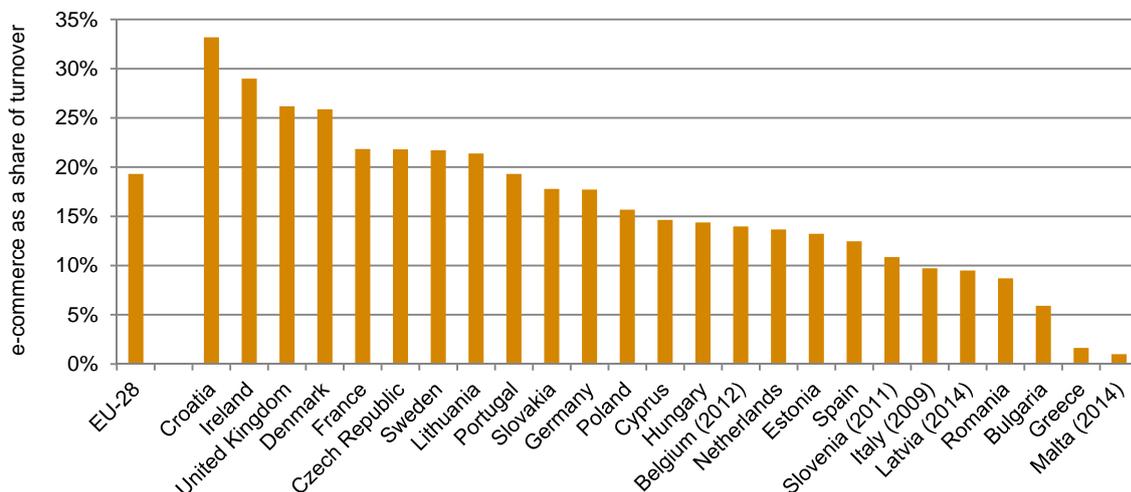
We can further break down e-commerce turnover in wholesale firms by country (Figure 50). Surprisingly, it is not innovation leaders like Sweden or Germany that lead the rankings, but Croatia and Ireland, while Greece and Malta take up the rear.

**Figure 49 / Total turnover from e-commerce by enterprises in different sectors, EU-28, 2009-2015**



Source: Eurostat, e-commerce statistics.

**Figure 50 / Total turnover from e-commerce in wholesale firms at country level, E-28, 2010 and 2015**



Source: Eurostat, e-commerce statistics.

To sum up, disintermediation seems to be the exception so far in European wholesale – which does not mean, however, that it does not happen in particular areas of the sector. Aggregate employment in wholesale is stable, and there is also some indication that wholesalers themselves are active in e-commerce. Moreover, the literature provides evidence that it is important for producers to employ diverse distribution channels, and not all products are equally suited to being sold online.

### 7.3. INNOVATION ACTIVITIES AND SKILLS IN WHOLESALE TRADE

Innovation is commonly regarded as a key driver of economic growth. For a long time, economists thought that innovation happens only in manufacturing, and they kept services out of the focus of innovation studies. However, in recent decades, services have become a performer of R&D and innovation itself (OECD 2006; Rubalcaba et al. 2008). The literature suggests that innovation in trade and other service sectors depends less on formal R&D, and more on design and other 'soft' innovation activities, and is also much more driven by the implementation of external technologies, including information technology (Miles 2005). Thus, embodied knowledge is a key driver of innovation in the service sector (Hauknes and Knell 2009).

In the following, we present results from the Community Innovation Survey (CIS) 2012 to characterise innovation in wholesale in terms of structure, input activities and innovation outputs. Where suitable, we compare wholesale to the manufacturing sector, in order to be able to evaluate where the sector stands out or falls behind.

What exactly is innovation in wholesale trade? The Oslo Manual, which is the methodological basis for the CIS, states that new or improved products on offer are 'generally not a product innovation for the wholesaler, ... However, if such a firm begins to deal with a new line of goods (i.e. types of goods that the firm has not previously sold) then this activity is to be considered a product innovation, as the firm is offering a new service' (OECD 2005: 57).

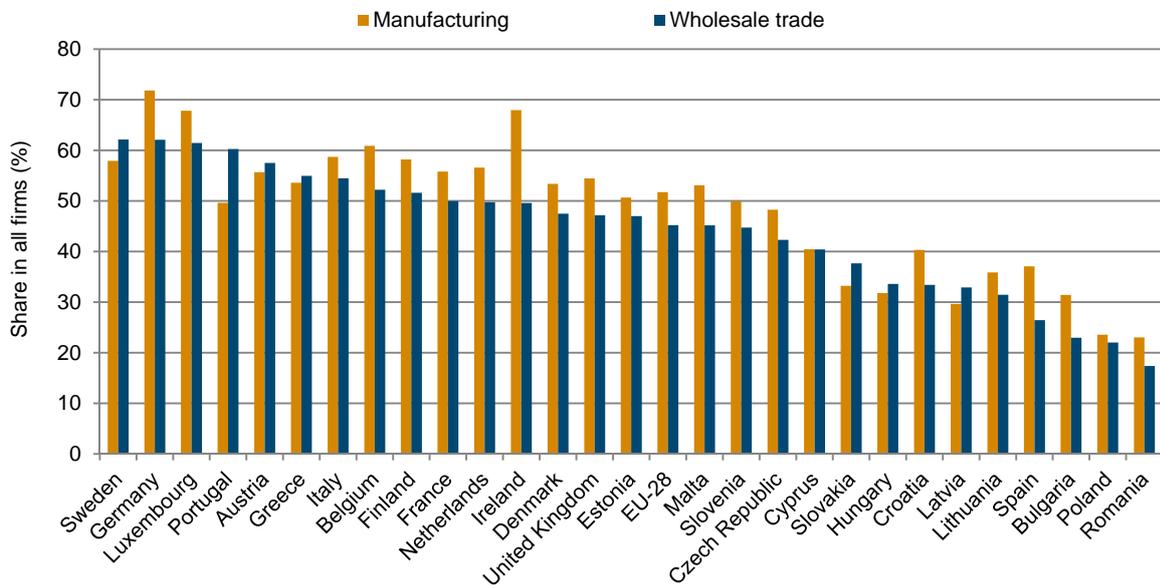
In addition to product innovation, improvements in the internal processes through new information technologies are one of the most important fields for innovation in wholesale firms. Examples are the introduction of e-commerce services in a wholesale firm, or electronic data exchange with key clients and suppliers, new inventory management systems based on radio frequency identification (RFID), etc. A new potential field for innovation in wholesale firms may be data analytics and 'big data'. But we may also find service innovations in wholesale firms that aim to satisfy the need of clients for after-sales services, training or consultancy services. The design and marketing of private-label products for their clients is another area of innovation activity among wholesale firms.

The CIS issues data by type of innovator, economic activity and size classes. The survey is currently carried out every two years across the EU, some EFTA countries and some EU candidate countries.

Figure 51 provides us with the shares of innovative firms per country in wholesale and manufacturing. Sweden and Germany are on top, both with 62% of all firms in wholesale being innovative, followed by Luxembourg and Portugal. Germany is also on top in manufacturing, with 72% of firms being innovative, but here it is followed by Luxembourg and Ireland, both with 68% of firms in manufacturing being innovative. The lowest shares of innovative firms can mostly be found in new Member States, plus Spain. In most countries, the share of innovators is higher in manufacturing than in wholesale. However, the differences are too small to find a general lack of innovativeness in wholesale.

In most countries we see a rather similar level of innovation activity in manufacturing and in wholesale, which leads to the conclusion that the level of innovation activities in both sectors is a result of country-wide factors, such as the level of market opportunities, skill levels or the general attitude towards technology, rather than being driven by sector-specific issues.

**Figure 51 / Innovative firms in manufacturing and wholesale as a share of total firms per sector, different EU Member States, 2010–2012**



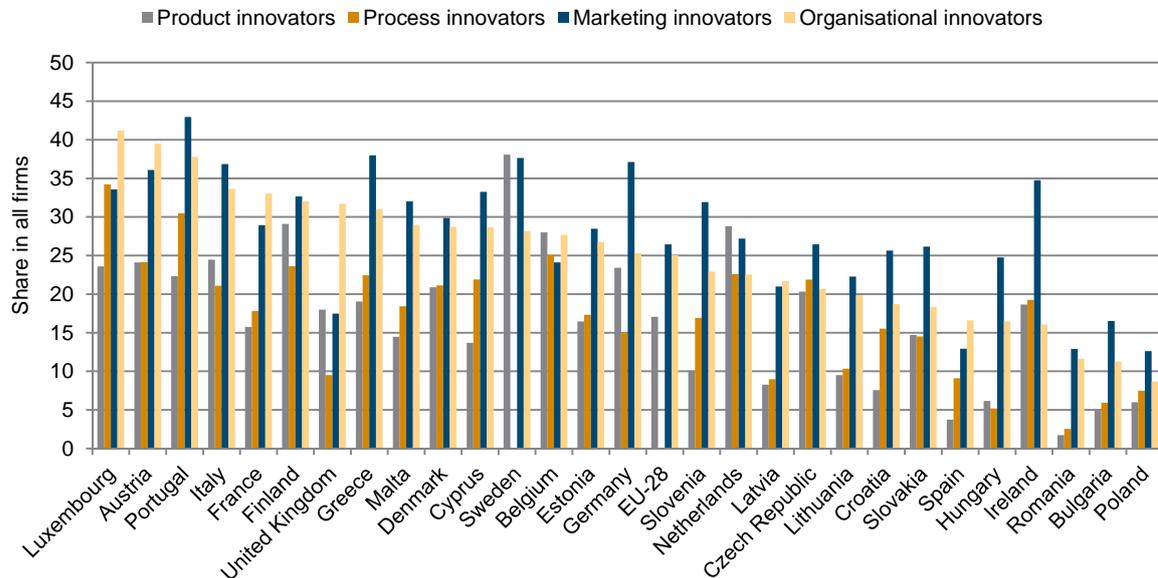
Source: Eurostat CIS 2012 (inno\_cis8\_type), own calculations.

In Figure 52 we can see the distribution of types of innovators in wholesale. There are four types of innovators – product, process, organisational and marketing innovators – plus combinations of all four types. In general, it is difficult to distinguish between different forms of innovation in services, because the product – for example a consultation – is often also the process, and many products are tailored to the needs of the customer, such as consultancy services. This makes it difficult to say when a service is new. In the case of trade services, the OECD (2005) also points to the fact that the introduction of a new product in the range of goods sold by a trade firm is not an innovation; rather it would be a new way of selling these products.

In most countries, the highest share of firms engaged in innovation in wholesale is concerned with marketing innovation, followed by organisational innovation. As these two are, by definition, the two forms of non-technological innovation, we may say that innovation in wholesale is predominantly non-technological. Technological innovation in wholesale, in turn, is in most countries dominated by process innovations. Product innovation in wholesale shows the lowest share in the majority of countries.

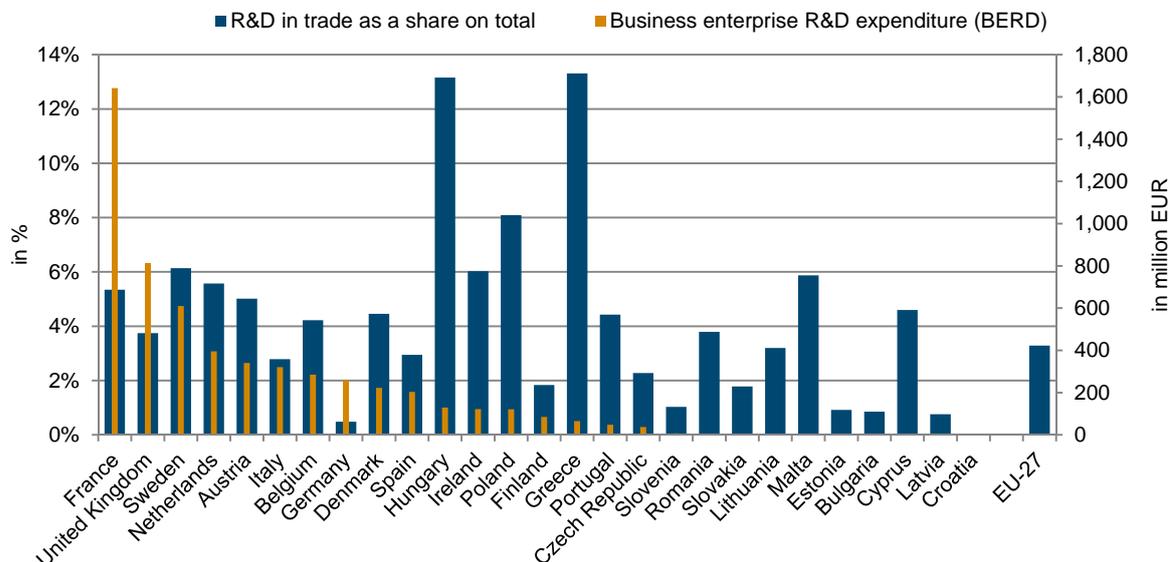
By contrast, in manufacturing (not depicted here) the significance of product innovation is increasing, although in only five countries (the UK, Germany, Sweden, the Netherlands, the Czech Republic) product innovators account for the highest proportion of innovators – over the EU-28 countries the share of product innovators equals the share of organisational innovators. Instead, in wholesale across the EU-28 countries (Figure 52), the share of marketing and organisational innovators is well above product innovators (data for process innovators not available for EU-28).

**Figure 52 / Types of innovators as a share of all firms in wholesale in different EU Member States, 2010–2012**



Source: Eurostat CIS 2012 (inno\_cis8\_type), own calculations.

**Figure 53 / R&D expenditure in wholesale and retail trade in million EUR and as a share of total in different EU Member States, 2010–2012**

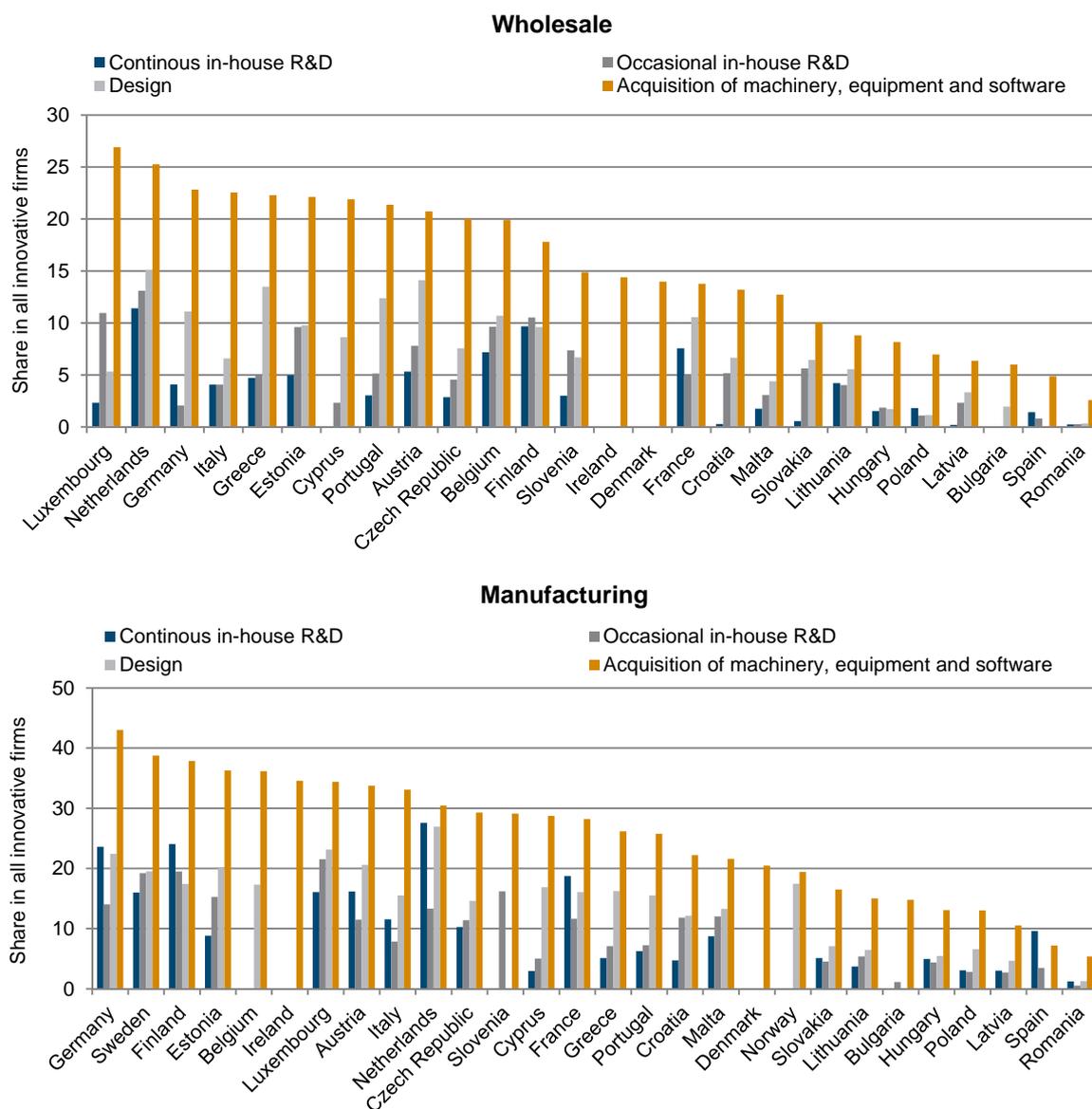


Source: Eurostat [rd\_e\_berdindr2], own calculations.

Considering inputs for innovation, Figure 53 gives an overview of R&D expenditure in wholesale and retail trade combined (separate data for the two sectors is not available). It shows that business enterprises' R&D expenditure in absolute terms is highest in France, followed by the United Kingdom, Sweden, the Netherlands and Austria. Considering R&D expenditure in wholesale as a share of total

business R&D expenditure, Greece, Hungary and other countries with relatively small total business R&D expenditure stand out most. This may be explained by the fact that subsidiaries of foreign multinational firms in these countries are registered as wholesale if they have no production activities in these countries. As a consequence, their R&D activity is also counted as R&D in trade.

**Figure 54 / Firms with different types of innovation input types as a share of total firms in wholesale and manufacturing, EU Member States, 2010–2012**



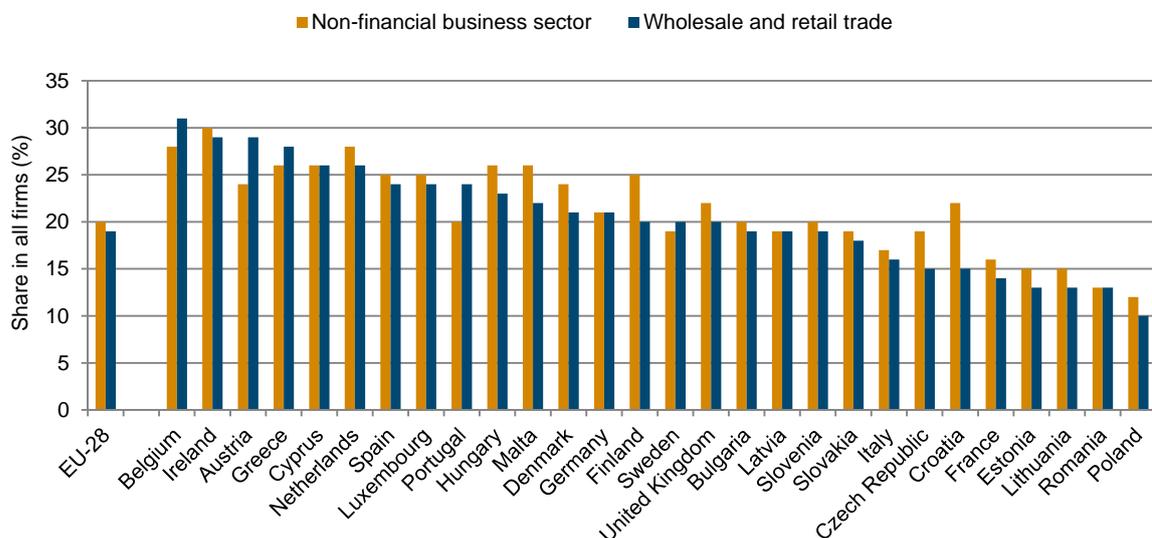
Source: Eurostat CIS 2012 (inno\_cis8\_exp), own calculations.

Innovation activities are a wider notion of input to innovation, as they capture more than R&D. Figure 54 shows the proportion of firms engaged in different forms of innovation activities and compares wholesale to manufacturing. These innovation activities include permanent and occasional R&D, design, and the acquisition of external technology in the form of machinery, equipment or software.

Apparently, the basic distribution of innovation activities is similar; as in all countries without exception in wholesale, as well as in manufacturing, the most frequent innovation activity is the acquisition of machinery, equipment and software. By contrast, in manufacturing, the proportion of firms engaged in continuous or occasional R&D activity is a lot higher than in wholesale. However, especially in wholesale, design activities are also an essential input for innovation. In only five countries (Finland, Slovenia, Luxembourg, Hungary and Poland) is design not the second most frequent innovation activity in wholesale firms. This confirms the literature that design plays an important part in the innovation processes of service firms.

Besides R&D, external knowledge and machinery, another crucial factor for innovation in services are skills – even more so in the service sector, where the production of services depends crucially on the employees. Unfortunately, the CIS used here does not provide data on investment in the skills of employees. However, we can rely on data provided by Eurofound (2014). According to Eurofound, the majority of employees in wholesale believe that their present skills correspond well with their duties. In this respect, there are no differences between a wholesaler and the average firm in the business sector. Moreover, the share of employees who report having received training does not differ from the EU-28 average.

**Figure 55 / Share of enterprises employing ICT/IT specialists in retail and wholesale trade and the non-financial business sector, EU-28, 2015**



Source: Eurostat Information Society Statistics (isoc\_ske\_itspen2), own calculations.

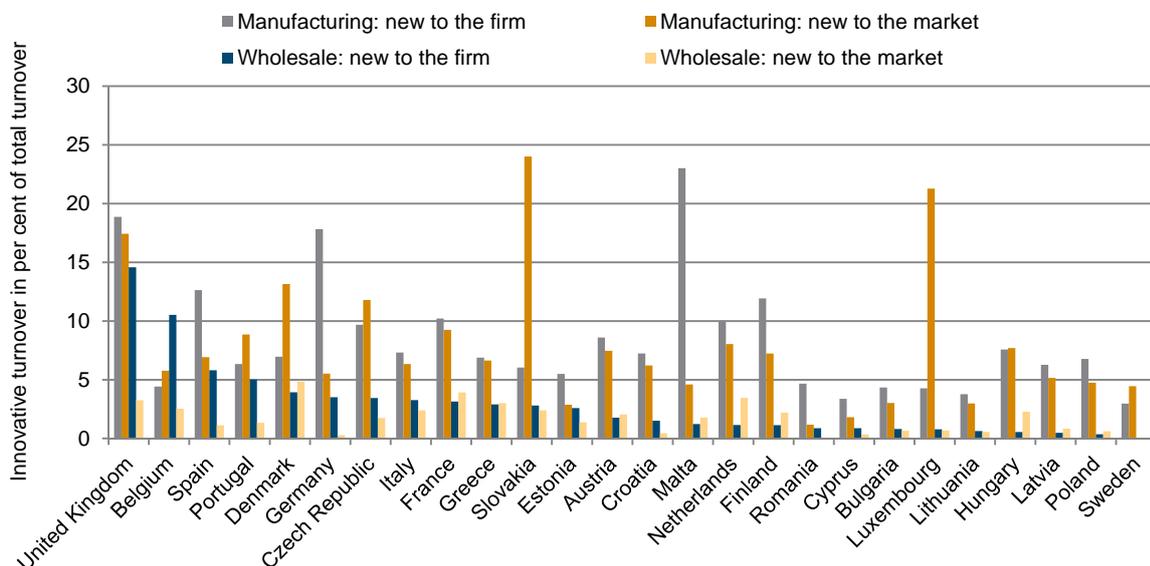
It is, however, clear that skills requirements will further increase in the future. The range of skills required in wholesale is affected by progress in the diffusion of e-commerce and other information and communication applications. Traditional skills like managing inventories, negotiating orders, managing buyer and seller relationships, as well as skills in logistics, will have to be complemented by new skills in ICT (Oxford Institute of Retail Management 2014: 26).

The following figure shows that retail and wholesale firms are aware of the need to develop these skills: it reveals the share of enterprises that employed ICT/IT specialists. Unfortunately, there are no separate data available for wholesale. Here, the trade sector is on a par with the business sector. Leading countries within Europe are Belgium, Ireland, Austria and Greece, which are also among the countries with the most innovative wholesale sectors.

We now turn to the economic returns to innovation. There are strong differences in innovation output across countries, in terms of turnover from products new to the firm as well as in terms of turnover from market novelties (Figure 56). In very small countries, this may be due to only a handful of firms with very high innovative turnover, which raise the average. However, readers should note that the indicator is only available for innovative firms. If we apply it to all firms in an economy, the value would decrease according to the share of innovative firms in the country.

In general, manufacturing firms generate higher economic returns than wholesale firms in both categories, which reflects the higher technological opportunities, but also better conditions for appropriating the returns to innovation in manufacturing (Cohen 2010). The UK is the country where wholesale firms can reap the highest benefits from innovation. Eastern European countries have the lowest values, which may be related to the low innovation inputs these countries exhibited in the previous figures.

**Figure 56 / Turnover in new products as a share of total turnover, EU Member States, 2010-2012**



Source: Eurostat CIS 2012 (inno\_cis8\_turnover), own calculations.

To sum up, there are lots of innovative firms in wholesale, although in most countries the share of innovators is higher in manufacturing than in wholesale. Differences between the two sectors are too small to conclude that wholesale is sluggish in terms of innovation. Wholesale firms are mainly engaged in non-technological forms of innovation, which correspond to innovative behaviour in other service sectors. Marketing innovation is the predominant form of innovation, followed by organisational

innovation. The most frequent innovation activity is the acquisition of machinery, equipment and software; less prevalent is continuous or occasional R&D activity, which is more widespread in manufacturing. In particular, design activities are an essential input for innovation in wholesale. The economic returns to innovation in wholesale lie below those of manufacturing firms. In general, manufacturing firms generate higher economic returns from products new to the market and innovations new to the firm.

#### 7.4. TANGIBLE INVESTMENT IN WHOLESALE TRADE

We saw in the previous section that investments in machinery and equipment constitute an important part of the innovation strategies of wholesale firms. Thus, in this section we take a closer look at tangible investment.

There is a tendency in the literature to regard service industries as less capital intensive and less investment intensive than manufacturing. The data for wholesale services support this assumption. The total value of tangible investment per person employed in wholesale is smaller than in manufacturing (around EUR 4,800 vs. EUR 7,200 in manufacturing – second column in the table below), but considerably higher than in retail trade (EUR 2,900). Total tangible investment in wholesale was about EUR 50 billion in 2013; about the same amount is invested in retail trade.

The gaps between the sectors are higher in investment per person employed than in investment per value added, which points to the higher labour productivity in manufacturing. Another difference between manufacturing and the two trade sectors lies in the components of investment. As can be seen from the table, manufacturing invests less in buildings and more in machinery; this can be explained by the greater need in trade for space to present and store goods.

**Table 12 / Tangible investment in wholesale trade, retail trade and manufacturing, EU-28, 2013**

Sector	Total (million EUR)	Investment per person employed (1,000 EUR)	Investment/value added (%)	Share of land and buildings in total tangible investment	Share of machinery and equipment in total tangible investment
Wholesale	49,579	4.8	8.9%	34%	66%
Retail	53,920	2.9	11.9%	48%	52%
Manufacturing	221,000	7.4	13.6%	20%	80%

Note: Ireland, France, Latvia, Malta and Sweden were taken out of the split of the composition of investment because no data were available.

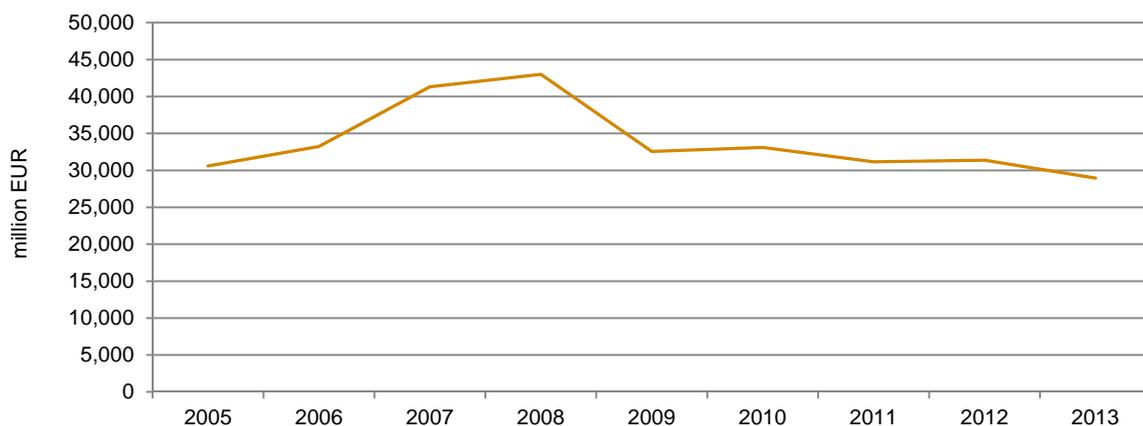
Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2).

Unfortunately, the data do not include information on investment in intangible goods, such as software or licences. This would give additional information on the importance of information and communication technologies in wholesale, which should be high, given the importance of e-commerce in this sector. Information on software investments, however, is only available for the whole trade sector.

From 2009 to 2013, tangible investment in wholesale decreased in the EU-28 by 0.2%. From 2012 to 2013 the volume of investment decreased by 3.5%. For the years before 2009, data for a number of countries are missing, and so it is difficult to say how investment evolved across the EU. We have calculated a value for tangible investment in wholesale for 19 EU Member States. Data are not available for Belgium, Croatia, Cyprus, France, Ireland, Malta, the Netherlands, Sweden and the UK, and so these countries are missing.

The data show a sharp increase in tangible investment for the 19 countries from 2005 and 2008; the years following 2008 are characterised by a steady decrease in investment levels. There was a sharp decrease from 2008 and 2009, followed by a more moderate decline in the years 2010–2013. Overall, based on the sample of 19 EU Member States, investments in wholesale in 2013 were still considerably lower than before the crisis. So, wholesale suffers from the same low investment levels as manufacturing.

**Figure 57 / Tangible investment in wholesale trade 2005–2013, 19 EU Member States, million EUR**



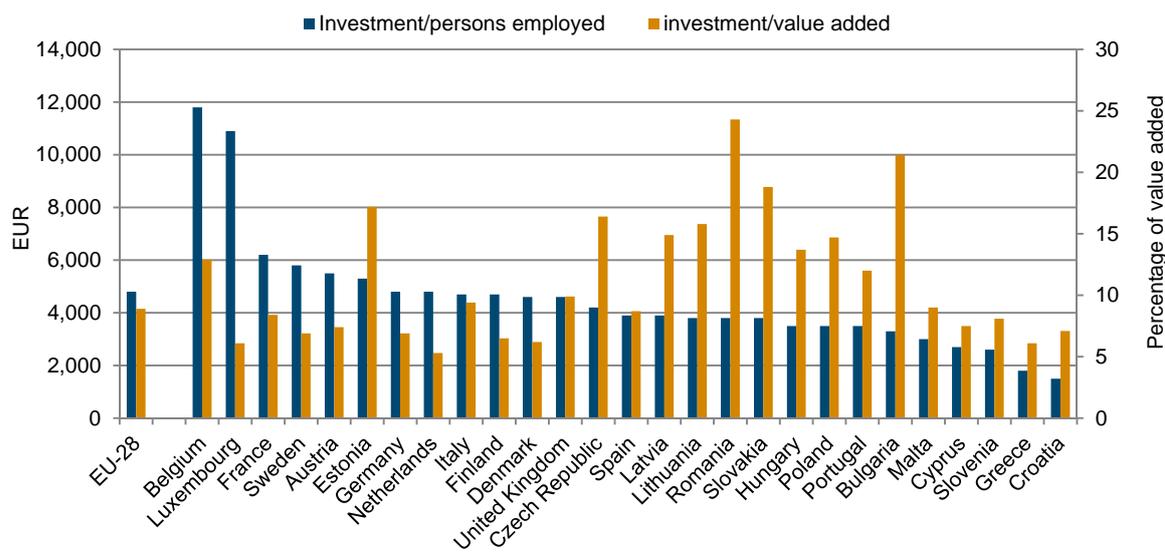
Note: No data for Belgium, Croatia, Cyprus, France, Ireland, Malta, the Netherlands, Sweden and the UK.  
Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2).

Figure 58 below illustrates differences between the EU Member States in tangible investment by wholesale firms. In terms of investment per person employed, the leading countries are Northern and Western European countries, including Belgium, Luxembourg, France and Sweden, while Southern European countries show the lowest investment propensities. This ranking is largely consistent with the ranking for the same indicator for manufacturing, and so we may assume that it resembles the overall investment climate of the country, rather than specific factors for wholesale.

A different picture emerges when we look at tangible investment per value added. Here, the leading countries are Middle and Eastern European Member States, including Romania, Bulgaria and Slovakia. The differences between the two measures reflect differences in personnel intensity and labour productivity between EU Member States. Estonia is the only country that ranks in the top 10 countries on both measures. Again, the ranking is consistent with the ranking for the same indicator for manufacturing, and so we may assume that it also reflects general factors to a considerable degree, rather than specific factors for wholesale.

In absolute terms, the largest tangible investment in wholesale can be found in Germany (EUR 8.7 billion), France (EUR 6.6 billion) and the UK and Italy (EUR 5.4 billion apiece). This is in line with the absolute number of persons employed in wholesale trade in these countries.

**Figure 58 / Tangible investment in wholesale trade in EUR per person employed and percentage of value added, 2013, EU-28 and individual Member States**



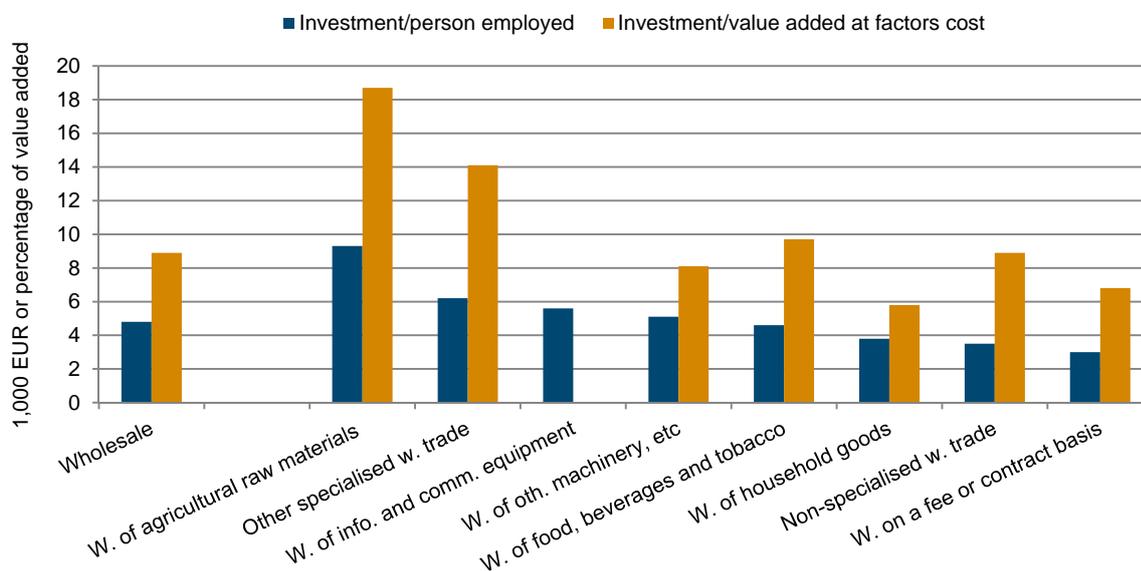
Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2).

At the level of wholesale sub-sectors, investment activity is dominated by NACE 46.7, other specialised wholesale, which accounts for EUR 13.9 billion of tangible investments, or 28% of total tangible investment in the wholesale sector. NACE 46.7 includes wholesale activity focused on energy and industrial raw materials, and so the high investment may reflect the need for storage capacity for oil, iron ore, etc.

Other important sub-sectors for investment are NACE 46.3 (wholesale of food, beverages and tobacco; EUR 8.2 billion), NACE 46.4 (wholesale of household goods; EUR 8.9 billion) and NACE 46.6 (wholesale of machinery; EUR 6.8 billion). All other sub-sectors together account for around 25% of total tangible investment in wholesale.

In relative terms, we see the highest investment intensities (investment as a percentage of value added) at sub-sector level in NACE 46.2, wholesale of agricultural raw materials. The highest investment intensity, however, does not convert into the highest labour productivity, as can be seen from section 5.1. NACE 46.2 has only average labour productivity, compared to other wholesale sub-sectors. We see the lowest investment intensity in NACE 46.1, wholesale on a fee or contract basis, a sector dominated by small or one-person firms.

**Figure 59 / Tangible investment in sub-sectors of wholesale trade in EUR per person employed and as a percentage of value added, EU-28, 2013**



Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2).

Altogether, the differences between sub-sectors in investment per person employed are slightly smaller than in investment per value added. Differences in investment intensities for the wholesale sector between countries are larger than between sub-sectors. The lowest value for investment per person employed at the country level is 31% of the value for the EU-28, while the corresponding value at the sub-sector level is 63% of the EU-28 value. The largest country value is 246% of the value for the EU-28, and 210% at the sub-sector level.

## 7.5. SUMMARY

Wholesale is a highly innovative sector of the European economy. Compared to manufacturing, there is no lack of innovative firms in wholesale. However, wholesale firms are less engaged in R&D and more often employ external technologies in their innovation projects. The economic returns to innovation in wholesale are below those of manufacturing firms.

An important part of innovation in wholesale are new information technologies. There is evidence that wholesalers themselves are very active in e-commerce, which may also explain why we see no (or only little) disintermediation in employment figures.

Expenditure on tangible investment such as buildings, machines or transport equipment dropped considerably in wholesale after the crisis, and has not yet recovered. On average, the wholesale sector spends less per employee on tangible investments than manufacturing, but considerably more than retail trade. Investment intensities are highest in wholesale of agricultural products.

## 8. Sectoral value chains in wholesale

This section considers the role of wholesale trade from an input-output perspective. In this approach, wholesale activities are an additional cost which a purchaser of products (like a firm buying intermediates from other firms) has to bear. This is reported in the supply and use framework as part of the difference between the purchase of a product in 'basic prices' and in 'purchasers' prices'; the latter include trade and transport margins and taxes, less subsidies on products. Having this information available (for each industry purchasing products from its own and other industries) one can investigate the size of the trade and transport margins (and within that the size of wholesale trade) as a cost item in the production process of each individual industry. In this section we explain in more detail how this information can be exploited, and provide a summary of the results across countries and over time indicating the role and magnitude of wholesale in industrial value chains. The results are based on the World Input-Output Database (WIOD), which allows light to be shed on these aspects of the role and importance of wholesale trade, and on the results derived from the Eurostat Structural Business Statistics (SBS) used in section 8.6.

### 8.1. THE CONCEPT OF SECTORAL VALUE CHAINS

The input-output (IO) framework provides a detailed picture of inter-industry relationships. IO data show the composition of the supply and use of goods and services for production purposes, as well as the absorption of products as final demand (private consumption, government consumption, gross fixed capital formation and exports) and components of value added (compensation of employees, gross operating surplus). For a proper understanding of how this can be done, one needs to have some knowledge of the information given in the supply and use tables, as well as of the concept of basic and purchasers' prices. In general, the IO framework consists of a set of tables:

- › The supply tables in basic prices, including a conversion into purchasers' prices, provide a detailed picture of the supply of goods and service products by domestic industries (in basic prices) and imports. It can be used to derive the (domestic) production of characteristic and secondary products in basic prices. Normally two columns are added: a column of taxes less subsidies, and a column of trade and transport margins, converting the supply in basic prices into supply in purchasers' prices.
- › The use tables in purchasers' prices provide information on the intermediate use of products by industry and final use (consumption, gross capital formation and exports). Prices in these tables are expressed in purchasers' prices. This means that, for example, the delivery of a product in a specific industry includes trade and transport margins and net taxes. The use tables also include the components of value added generated by industries in the domestic economy.
- › Valuation tables provide information on the magnitude of the 'trade and transport margins' and net taxes on products (taxes less subsidies) allowing the use table in purchasers' prices to be converted into a use table in basic prices; the transactions reported in the basic price tables therefore do not

include trade and transport margins. However, these are reclassified as inputs of trade and transport services.

- › Finally, the symmetric input-output tables are derived from two sets of tables, the supply table and the use table in basic prices. These IO tables are organised either product-by-product or industry-by-industry.

For the following analysis, it is important to understand the role of wholesale in the IO framework and how trade and transport margins are implemented. Looking at wholesale trade in the IO framework is different from other industries/products due to the different price concepts applied. While transactions in basic prices do not include trade margins, purchasers' prices do, and the difference is mapped in the so-called 'trade margins' valuation matrices. Thus, one gets different pieces of information about wholesale trade services depending on which tables are looked at (see Box 1 for technical details).

#### **BOX 1 / TECHNICAL BOX: ACCOUNTING OF TRADE AND TRANSPORT MARGINS IN THE SUPPLY/USE AND INPUT-OUTPUT FRAMEWORK**

Trade and transport services in the supply/use and input-output framework need to be treated in a special way: first, one needs to avoid recording goods used in other industries as having been bought from the wholesale (or retail) trade sector itself, as this would lead to most products being reported as sourced from trade sectors, whereas one aims to assign the product used to the delivering industry. Thus goods purchased and sold by wholesalers are not counted as intermediate goods. Wholesalers and retailers are treated as supplying services, and their output is measured by the total value of the trade margins realised on the goods they purchase for resale (Eurostat 2008: chapter 6).

Second, the trade (wholesale and retail) and transport services are accounted in such a way that the services associated with the delivery of the product are taken into account as the difference between producers' and purchasers' prices. Thus, this is related to the use of various price concepts: (i) basic prices, (ii) purchasers' prices and (iii) producers' prices. The relationship between these is as follows:

Basic prices

+ (taxes on products (excluding VAT) - subsidies on products)

= Producers' prices

+ trade and transport margins

+ non-deductible VAT

= Purchasers' prices

In the following, we use information from the supply table, the use table at purchasers' prices and basic prices, the trade and transport margins matrix, and the symmetric input-output table to shed light on the role of wholesale trade in economic systems. One should, however, bear in mind that the data are partly constructed (extrapolated from existing information) and that valuation matrices are partly constructed in the process of generating supply and use tables for the WIOD project (Dietzenbacher et al. 2013); thus the results discussed below are informative, but need to be interpreted with care.<sup>3</sup>

<sup>3</sup> National statistical offices have only recently partly reported valuation matrices in the supply and use and input-output framework.

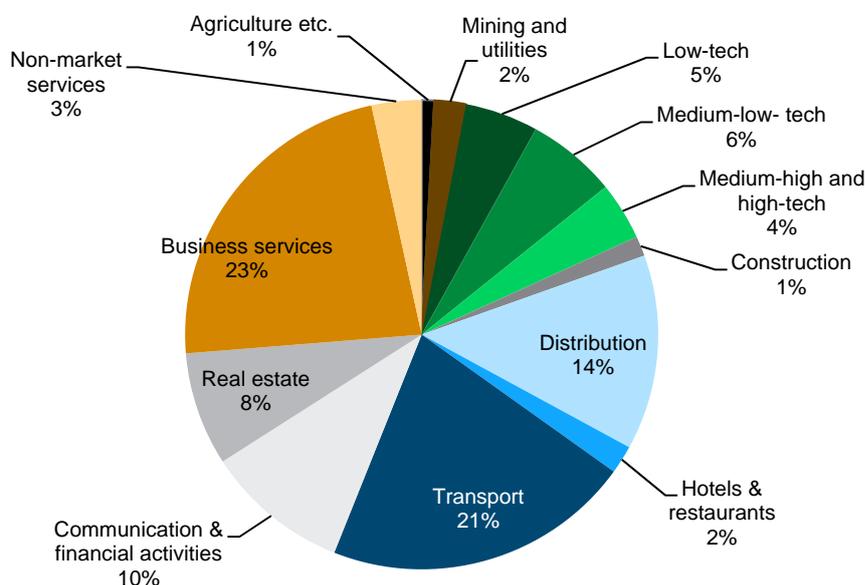
## 8.2. INPUT AND OUTPUT STRUCTURE OF THE EU-27 WHOLESALE SECTOR

We first take a glance at the wholesale sector itself, i.e. considered as an industry, not a product, and analyse its input and output structure in more detail. This structure is represented by the cost and sales structure of the sector – or, put differently, the direct linkages with the upstream and downstream sectors of the wholesale industry.

Considering first the **input side of the EU-27 wholesale sector ('cost structure')**, one can distinguish between total intermediate consumption and value added. The output of the wholesale sector amounted to USD 1,610 billion in 2011, of which intermediate inputs accounted for 47% and value added for 51% (the rest is due to taxes less subsidies). Thus, value added takes a larger share than intermediates, as is typical of service sectors in comparison to manufacturing sectors.

Figure 60 shows the input structure for total intermediate inputs at an aggregated level. One finds that the main inputs for the EU-27 wholesale sector are business services (23%) and transport services (21%). Other main inputs include manufacturing (15%, of which 5% involves low tech, 6% medium-low tech and 4% medium-high and high-tech inputs), communication and financial services (10%) and real estate (8%). Distribution takes a share of 14%, but includes own supply (wholesale), which accounts for 10%.

**Figure 60 / EU-27 wholesale sector: input structure of total intermediate consumption, 2011**



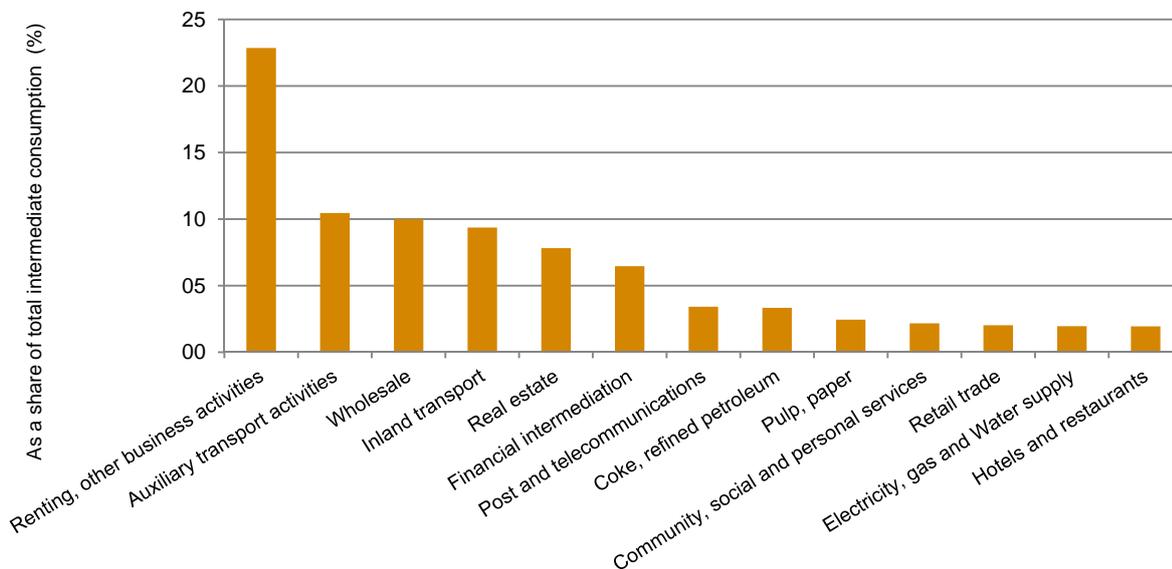
Notes: Data do not include products for resale. Total intermediate consumption includes own supply/own use of the wholesale sector.

Source: WIOD input-output tables, own calculations.

More disaggregated data for the largest inputs (accounting for 84% of total intermediate consumption) are presented in Figure 61. Again, one finds large shares for business services (NACE 71-74 – renting of machinery and other business activities) with 23%, followed by other supporting and auxiliary transport activities (NACE 63) with 10%. Own supply of the wholesale sector is followed by inputs of

inland transport (9%), real estate activities (8%) and financial intermediation (6%). The remaining inputs have shares of around or below 3% of total intermediate consumption.

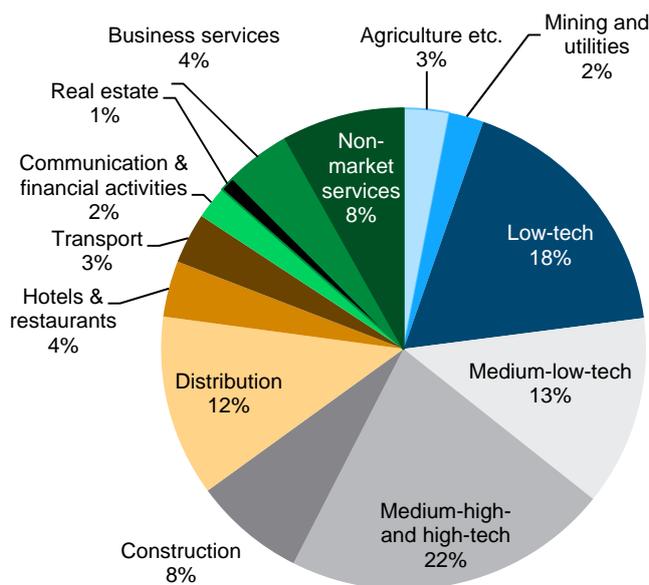
**Figure 61 / EU-27 wholesale sector: main inputs, 2011**



Note: Data do not include products for resale. Total intermediate consumption includes own supply/own use of the wholesale sector.

Source: WIOD input-output tables, own calculations.

**Figure 62 / EU-27 wholesale sector: output structure of total intermediate supply, 2011**



Note: Data do not include products for resale. Total intermediate consumption includes own supply/own use of the wholesale sector.

Source: WIOD input-output tables, own calculations.

Overall, intermediate inputs are mostly sourced from domestic sources (i.e. within the EU-27) and less from outside the EU (EU-extra). Only 8% of total intermediate goods were imported in 2011 (4% of total output), while 92% came from within the EU.

Turning now to the **output side of the EU-27 wholesale sector ('sales structure')** a closer look at the structure of intermediate supply is offered by Figure 62. About 52% of wholesale services are supplied to manufacturing industries, of which 22% go to medium-high and high-tech industries, 18% to low-tech industries and 13% to medium-low-tech industries. Some 8% go to construction and to non-market services. Distribution again includes own use of wholesale, with 8%.

### 8.3. THE ROLE OF WHOLESAL TRADE IN THE INPUT-OUTPUT FRAMEWORK

Using information from the supply tables, one can first consider the role of wholesale services (CPA 51)<sup>4</sup> as part of the activities of individual industries – for example, the supply of wholesale services by the chemical or any other industry as part of the 'non-characteristic product'. One can see that the share of wholesale trade activities as a percentage of gross output of the manufacturing industries and construction is rather low, at slightly above 1%.

Again these shares differ across countries, from more than 3% in Belgium to less than 1% in a few countries (the lowest share for all countries reporting non-zero values is for Portugal, at about 0.6%). Thus, the supply of wholesale trade services by individual industries other than wholesale is generally low and is not further considered in detail. However, it is important to note here that wholesale trade activities which are provided 'in-house' are not captured by these numbers.

The second issue addressed is how much trade and transport margins (which include wholesale trade margins) contribute to the overall value of goods supplied in an economy in purchasers' prices. This information can be retrieved from the valuation columns in the supply table. The goods provided domestically in basic prices – i.e. the goods supplied by the individual industries plus imports plus trade and transport margins (including the wholesale trade margins) and taxes less subsidies (on products) – equal the value of products available in an economy in purchasers' prices. Considering manufacturing products (CPA15 to CPA37), the total trade and transport margins account for about 15% of the total supply (=use) of manufacturing products in purchasers' prices and are therefore not negligible. This share has remained fairly stable (at around 15%) over time.<sup>5</sup> However, there are large differences across countries. These shares range from about 25% in Greece to less than 10% in Hungary and the Czech Republic (see the figure below).

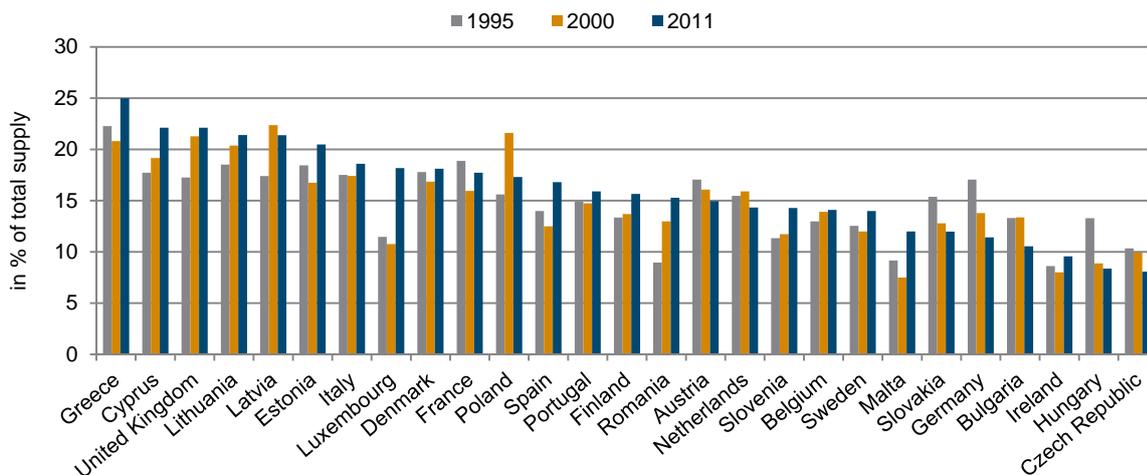
From another perspective – the use side – industries are users of trade and transport services, including wholesale trade services. As such, wholesale services might constitute an important input in the production processes of various industries which are accounted for as a (direct) cost item in these industries' production. Considering an individual industry, these trade and transport costs are included in

<sup>4</sup> CPA refers to the 'Statistical Classification of Products by Activity in the European Economic Community'. This is a classification of goods and corresponds to the NACE: for example NACE 46, wholesale trade, corresponds to CPA 46, wholesale trade services.

<sup>5</sup> These numbers are calculated from WIOD supply tables as the share of trade and transport margins for manufacturing products CPA15-CPA37 as a percentage of total supply in purchasers' prices of these products.

the value of intermediates that an industry purchases for its production and are reported as an item for inputs of wholesale services in the use table in basic prices. As explained above, to make the use of trade and transport services explicit, one has to net out these costs from the value of the purchased product (in purchasers' prices) and report these as trade and transport services that the industry purchases for its production.

**Figure 63 / Share of trade and transport margins in manufacturing products, in % of total supply in purchasers' prices**



Source: WIOD supply tables; own calculations.

This is done when transforming the use table in purchasers' prices into the use table in basic prices.<sup>6</sup> In basic prices, the costs of the purchase of a specific product by an industry are then the actual costs of that product, whereas the trade and transport services (to provide this product to the buyer) are reported as costs of trade and transport services. In the conversion into basic prices, the trade and transport margins are split into inputs from trade (wholesale and retail) and various transport activities; this allows one to proxy the costs for wholesale trade.

How big, then, are these costs of trade and transport margins – the amount of trade and transport services used by different industries – in the overall economy and in the manufacturing industries (plus construction) in particular? Calculating the share of wholesale trade activities as a percentage of total gross output of all industries in the EU-27, one finds that about 5% of total costs are due to wholesale trade. When considering manufacturing industries and construction only, this share is again about 5%.<sup>7</sup> Furthermore, these shares have remained quite constant over time.

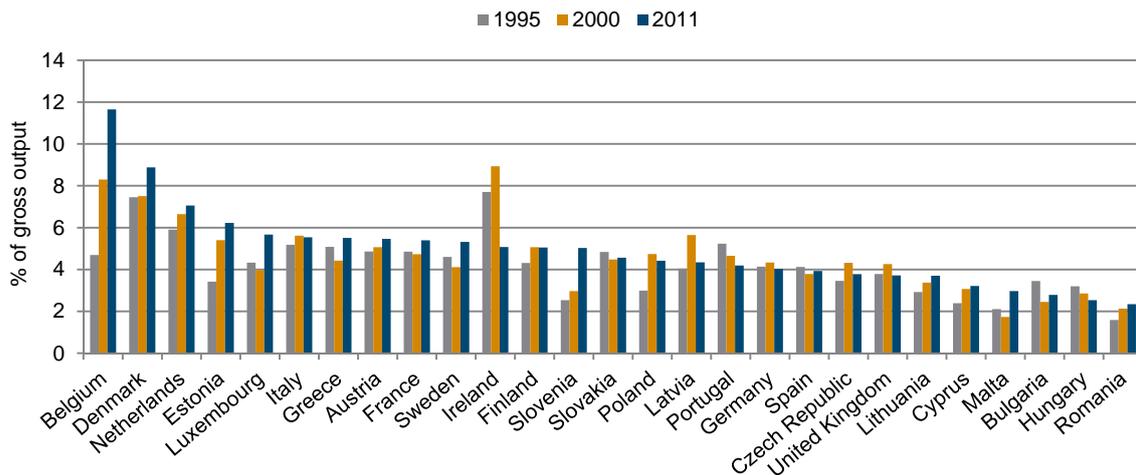
With respect to individual countries, one again finds significant differences, however. The share of wholesale services in total costs (in manufacturing and construction) ranges from almost 12% in Belgium to 8% in Denmark and to slightly above 2% in Bulgaria, Hungary and Romania (Figure 64). This share has increased in most countries (the strongest gains are in Belgium and Slovenia), but has decreased in a couple of countries. Therefore, no common trend of a general increase or decrease in wholesale

<sup>6</sup> Additionally, in basic prices taxes less subsidies (on products) are taken out.

<sup>7</sup> Compared to the share of 15% stated above one has to note that here only wholesale trade cost shares are considered.

intensity can be observed. There could be various reasons for the changes – like changes in the structure of industry, longer supply chains, relative price changes of intermediate inputs – which are difficult to disentangle and require country-specific assessments.

**Figure 64 / Share of wholesale services costs in manufacturing and construction, in % of gross output**



Note: For Belgium, wholesale and retail is reported together from 2000; therefore shares from the period before have been used to adjust wholesale shares in gross output in 2000 and 2011.

Source: WIOD use tables; own calculations.

A third indicator, which shows the importance of trade and transport, is the difference between the prices of intermediate inputs valued in basic versus purchasers' prices (e.g. expressed as a percentage of basic prices) and the magnitude of trade and transport margins therein. This can be derived by using information from basic price tables and the valuation matrices for trade and transport margins. Thus the question is how much cost an industry has to bear in addition to the purchase of intermediate goods for trade and transport services.

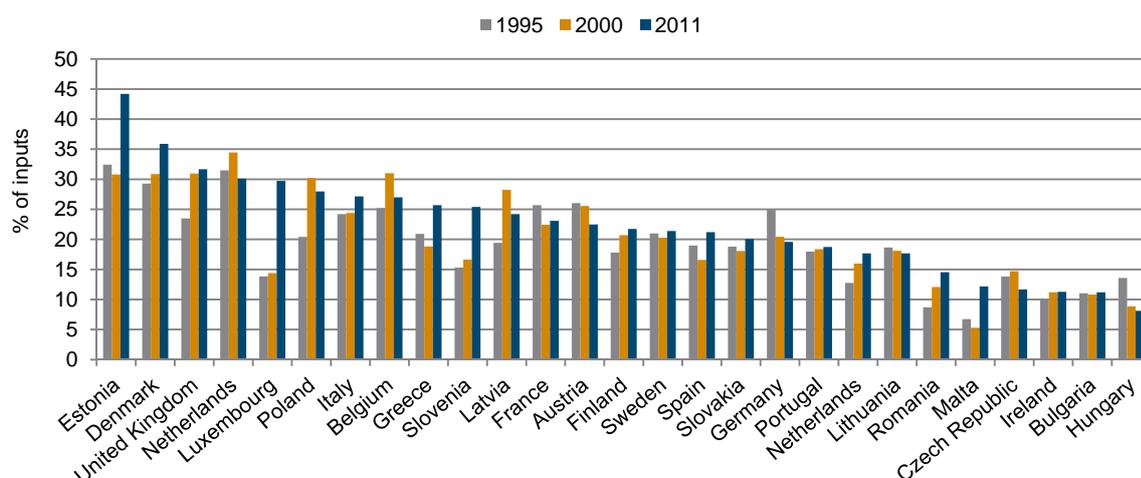
For the total EU-27, costs of trade and transport margins add almost a quarter to inputs in basic prices. The magnitude of trade and transport costs as a percentage of basic prices, i.e. costs of trade and transport services additional to the purchase of the intermediates (in basic prices), amounts to almost a quarter of the basic price costs (when considering manufacturing and construction industries and their inputs of product categories CPA 01–CPA 37, i.e. agriculture, mining and manufacturing inputs).<sup>8</sup>

Unfortunately, it is not possible to split wholesale services costs out of the trade and transport margins reported in the trade and transport valuation matrices. However, one can give an indication of how important wholesale trade is in this respect. The share of wholesale costs (CPA 51) in total margins (i.e. products CPA 50–63 are wholesale and retail trade and transport services) is about 50%. This would suggest that wholesale trade services account for about 12% of total intermediate inputs in basic prices.

<sup>8</sup> This share is calculated as the sum of trade and transport margins provided in the valuation matrices as a percentage of inputs in basic prices (taken from the use tables in basic prices).

Figure 65 presents these shares for the individual Member States. Again there are relatively large differences. These range from about 30% in Estonia and Denmark to about 10% in the Czech Republic, Ireland, Bulgaria and Hungary. Finally, the shares of wholesale trade in total margins in the individual Member States generally range from about 40% to 60%, indicating that roughly half of the shares presented in Figure 65 are due to wholesale trade.

**Figure 65 / Share of trade and transport margins of intermediate inputs (CPA 01–CPA37) in manufacturing industries and construction, % of inputs in basic prices**



Source: WIOD use tables; own calculations.

The numbers presented in the three previous figures shed different lights on the role of magnitudes of wholesale trade in the supply and production of output. These are not unrelated, of course, as they are dependent on the overall magnitudes of trade and transport margins. Therefore, the ranking of countries in these three graphs is correlated, though it is not identical (as numbers also depend on other things, like industry structures, magnitude of retail and transport services, prices of other intermediates, etc., which cannot be sorted out in detail).

### 8.4. WHOLESALE TRADE IN SELECTED VALUE CHAINS

In the following, five industries have been selected, and the role of wholesale trade in their ‘value chain’ is considered in more detail. These five industries are food and beverages (NACE Rev. 1 15t16), Textiles (NACE Rev. 1 17t18), Machinery (NACE Rev. 1 29), Transport equipment (NACE Rev. 1 34t35) and Construction (NACE Rev. 1 F); the industry dimensions are selected in accordance with the WIOD data. The questions addressed are: which are the important upstream and downstream sectors in the respective value chains? Where are the costs and value added generated? And – in particular – what is the role of wholesale trade in these?

A first look at the relevance of the wholesale sectors as an input into the production process of the respective industries’ value chains is provided by considering the (direct) cost shares of all inputs (including primary factor income, i.e. value added), which together sum up to the value of gross output of these industries. This information – now taken from the input-output table – is provided in Table 13

below. The table includes intermediate goods sources from other firms of the own industry as well as from other industries. We have separated inputs according to their source into intra-EU inputs (sourced within all 27 EU countries) and extra-EU inputs (sourced from outside the EU).<sup>9</sup>

**Table 13 / Cost shares for EU-27 of selected industries in % of gross output, 2011**

	Food and beverages	Textiles	Machinery	Transport equipment	Construction
<b>Intra-EU</b>					
Agriculture, etc.	16.9	0.9	0.0	0.0	0.2
Mining and utilities	2.2	2.7	1.4	1.1	1.0
Low tech	14.7	16.6	1.2	1.5	2.3
Medium-low tech	3.5	2.5	16.8	13.8	12.3
Medium-high and high tech	1.8	4.9	16.8	28.5	3.6
Construction	0.5	0.7	0.5	0.4	16.6
Distribution, etc.	8.1	9.5	5.3	6.3	5.3
Wholesale	6.4	7.0	4.1	4.4	2.6
Transport and communication	3.9	3.6	2.6	2.5	1.7
Business services	7.8	6.8	7.5	6.8	7.7
Non-market services	0.5	0.3	0.4	0.5	0.3
<b>Extra-EU</b>					
Agriculture, etc.	2.3	0.1	0.0	0.0	0.0
Mining and utilities	0.1	0.1	0.1	0.1	0.3
Low tech	1.3	5.3	0.1	0.3	0.2
Medium-low tech	0.4	0.3	2.0	1.7	1.1
Medium-high and high tech	0.3	1.4	3.4	4.9	0.8
Construction	0.0	0.0	0.0	0.0	0.1
Distribution, etc.	0.2	0.2	0.2	0.2	0.2
Wholesale	0.3	0.3	0.2	0.2	0.1
Transport and communication	0.3	0.3	0.3	0.3	0.1
Business services	0.7	0.5	0.6	0.5	0.6
Non-market services	0.0	0.0	0.0	0.0	0.0
Total intermediates	72.3	64.0	63.4	74.1	57.2
Value added	27.7	36.0	36.6	25.9	42.8
Gross output	100.0	100.0	100.0	100.0	100.0

Source: WIOD input-output tables; own calculations.

This table indicates that the (direct) domestic cost share of wholesale services in gross output of industry food and beverages is 6.4%. The share of wholesale trade in textiles is of similar magnitude, whereas the share of machinery and transport equipment is lower, at around 4–4.5%, and construction is only 2.6%.

The contribution of wholesale to gross output in these value chains can be directly compared to the contribution of other sectors. For the first two value chains, the share of wholesale is comparable to the contribution of business services; for the remaining three value chains, the share is about half that of business services (and even less compared to construction). The cost shares of wholesale trade from sources outside the EU are rather small.<sup>10</sup> This is due to the importance of multinational affiliates, which provide wholesale trade services (but are accounted in the EU, given the definition of GDP by geographic location).

<sup>9</sup> The information provided in this table, i.e. the direct cost share of wholesale trade, is in line with that in Figure 64, which is based on the use table and provides for total manufacturing plus construction.

<sup>10</sup> One should note that this table reports the share of intermediate inputs from extra-EU as a percentage of gross output. In terms of intermediates the share of extra-EU imports is larger; furthermore, these shares do not include imports of final products.

The contribution of wholesale in these value chains is also more important than the contribution of many manufacturing sectors. We have aggregated manufacturing into low tech, medium-low tech, and medium-high and high tech. In monetary terms, food and beverages relies more on wholesale than on contributions from medium-low tech, medium-high and high tech combined. The contribution of wholesale in textiles is about the same as the three aforementioned manufacturing sectors. In machinery and equipment, it is considerably lower. In all five sectors, the contribution of wholesale is larger than that of transport and communication, while it is smaller than other distribution channels (mostly retail).

The diversity and heterogeneity of the importance of wholesale trade for different value chains becomes apparent when we look at the more detailed country level. Table 14 displays the cost shares of wholesale services in gross output of all five industries for all EU countries, distinguishing between domestic, EU and non-EU sources. Across countries and industries, the domestic sourcing of wholesale trade dominates, with the sole exception of Ireland, where non-EU sourcing is most important. We also see that non-EU sourcing is more important than EU sourcing for some countries.

**Table 14 / Cost shares of wholesale trade of selected industries as % of gross output, 2011**

	Food and beverages			Textiles			Machinery			Transport equipment			Construction		
	Domestic	EU	Non-EU	Domestic	EU	Non-EU	Domestic	EU	Non-EU	Domestic	EU	Non-EU	Domestic	EU	Non-EU
Austria	6.0	0.1	0.2	9.0	0.2	0.4	5.1	0.2	0.2	5.0	0.1	0.2	3.1	0.1	0.1
Belgium	9.3	0.1	0.8	8.9	0.3	0.8	6.2	0.3	0.6	8.1	0.2	0.8	3.4	0.1	0.3
Bulgaria	4.7	0.1	0.0	2.6	0.1	0.0	2.4	0.1	0.0	2.5	0.1	0.0	2.3	0.1	0.0
Cyprus	5.2	0.1	0.0	7.1	0.1	0.0	2.2	0.2	0.0	2.9	0.1	0.0	1.9	0.1	0.0
Czech Republic	6.9	0.1	0.0	9.1	0.3	0.0	3.5	0.2	0.0	3.2	0.2	0.0	1.8	0.1	0.0
Germany	4.5	0.1	0.2	7.0	0.2	0.3	2.3	0.2	0.1	2.8	0.1	0.1	2.2	0.1	0.1
Denmark	7.7	0.1	0.5	14.4	0.2	0.9	11.3	0.3	0.7	14.4	0.3	0.9	8.1	0.1	0.5
Spain	5.1	0.0	0.1	7.1	0.1	0.1	3.7	0.1	0.1	4.8	0.1	0.1	1.5	0.0	0.0
Estonia	4.6	0.1	0.0	5.9	0.1	0.0	5.9	0.2	0.0	7.0	0.1	0.0	4.6	0.1	0.0
Finland	6.3	0.1	0.3	7.1	0.2	0.4	3.9	0.1	0.2	4.9	0.1	0.2	4.4	0.1	0.2
France	8.3	0.1	0.3	7.3	0.1	0.3	5.0	0.1	0.2	6.2	0.1	0.2	3.1	0.1	0.1
United Kingdom	4.2	0.0	0.0	6.6	0.1	0.0	3.7	0.1	0.0	4.5	0.1	0.0	1.2	0.0	0.0
Greece	5.8	0.1	0.1	5.5	0.1	0.5	3.5	0.1	0.3	3.0	0.1	1.2	6.4	0.1	0.0
Hungary	2.4	0.1	0.3	3.6	0.3	0.4	1.6	0.2	0.2	1.7	0.2	0.2	2.3	0.2	0.2
Ireland	0.5	0.1	4.1	0.5	0.1	3.9	0.5	0.2	3.7	0.3	0.1	2.7	0.3	0.1	2.1
Italy	8.8	0.0	0.5	7.0	0.1	0.4	5.0	0.1	0.3	5.9	0.1	0.4	2.7	0.0	0.1
Lithuania	4.3	0.1	0.1	2.2	0.3	0.1	3.8	0.2	0.1	4.0	0.1	0.1	2.8	0.1	0.1
Luxembourg	7.2	0.3	0.4	9.0	0.4	0.5	8.5	0.3	0.5	6.8	0.4	0.4	3.1	0.2	0.1
Latvia	7.0	0.1	0.1	5.7	0.2	0.1	3.7	0.2	0.1	3.6	0.1	0.1	2.5	0.1	0.0
Malta	3.2	0.1	0.0	7.9	0.1	0.0	2.1	0.2	0.0	1.0	0.1	0.0	2.0	0.3	0.0
Netherlands	9.4	0.1	0.1	10.2	0.1	0.0	8.2	0.1	0.0	8.8	0.1	0.0	5.1	0.1	0.0
Poland	5.5	0.1	0.1	5.8	0.1	0.1	4.2	0.1	0.1	6.4	0.1	0.1	3.4	0.1	0.2
Portugal	5.8	0.1	0.3	5.5	0.1	0.3	3.3	0.2	0.2	4.1	0.1	0.2	1.8	0.0	0.1
Romania	3.3	0.1	0.0	2.2	0.2	0.0	1.8	0.2	0.0	2.0	0.1	0.0	1.1	0.1	0.0
Slovakia	6.6	0.1	0.1	6.4	0.2	0.1	6.5	0.2	0.1	5.1	0.1	0.1	2.8	0.1	0.0
Slovenia	6.6	0.1	0.2	4.8	0.2	0.2	4.5	0.2	0.2	5.8	0.2	0.2	3.1	0.1	0.1
Sweden	5.7	0.1	0.2	5.3	0.1	0.2	4.7	0.1	0.2	4.2	0.1	0.2	2.8	0.1	0.1

Source: WIOD input-output tables; own calculations.

Across all five value chains, we find quite large domestic wholesale cost shares for Denmark, the Netherlands, Luxembourg and Belgium. Together with these countries, the following countries are above

the EU-27 average (by more than 1 percentage point) in terms of wholesale trade shares in the food value chain: France and Italy; in the textiles value chain: Austria and the Czech Republic; in the machinery value chain: Austria, Estonia and Slovakia; in the transport equipment value chain: Estonia, France, Italy, Poland and Slovenia; and in the construction value chain: Estonia, Finland and Greece.

To summarise, wholesale trade accounts for a non-negligible part of inputs (costs) in the production process of the five value chains analysed. In three of them, the total contribution of wholesale accounts for between 6% and 10% of total intermediates sourced in these industries and for 3–7% of total gross output. The share tends to be higher in the two low-tech value chains of food and beverages and textiles, and is lowest in construction.

**Table 15 / Cost shares of wholesale trade for EU-27 in 2011, in %**

	Food and beverages	Textiles	Machinery	Transport equipment	Construction
Cost share of wholesale trade in % of intermediates	9.3	11.4	6.7	6.2	4.8
Cost share of wholesale trade in % of gross output	6.8	7.3	4.2	4.6	2.8

Note: Includes domestic and foreign cost shares.

Source: WIOD; own calculations.

**Table 16 / Value added creation along five value chains of EU-27 in 2011, as % of total**

	Food and beverages	Textiles	Machinery	Transport equipment	Construction
<b>Intra-EU</b>					
Agriculture, etc.	10.9	0.8	0.2	0.2	0.4
Mining and utilities	2.7	2.7	2.1	2.1	2.0
Low-tech	33.9	43.9	1.4	1.7	1.8
Medium-low-tech	2.7	2.0	9.3	9.0	7.0
Medium-high- and high-tech	2.2	3.1	44.9	38.1	2.8
Construction	0.8	0.9	0.8	0.8	51.8
Distribution, etc.	10.0	10.3	7.4	9.1	7.3
Wholesale	5.6	5.6	4.0	4.7	3.0
Transport and communication	4.9	4.5	3.7	4.1	3.0
Business services	12.6	11.0	11.5	12.3	11.1
Non-market services	1.0	0.7	0.8	0.9	0.7
<b>Extra-EU</b>					
Agriculture, etc.	2.6	1.0	0.2	0.3	0.2
Mining and utilities	2.2	2.5	2.9	3.0	2.3
Low-tech	0.9	3.1	0.5	0.7	0.4
Medium-low-tech	0.8	0.9	2.3	2.6	1.3
Medium-high- and high-tech	1.0	1.7	2.6	3.7	1.1
Construction	0.1	0.1	0.1	0.1	0.1
Distribution, etc.	1.0	1.1	1.1	1.3	0.7
Wholesale	0.9	1.0	0.9	1.1	0.6
Transport and communication	1.1	1.2	1.1	1.3	0.8
Business services	2.1	2.0	2.2	2.6	1.7
Non-market services	0.1	0.1	0.1	0.1	0.1

Source: WIOD; own calculations.

An alternative way of viewing a value chain is to consider it as the sum of all primary inputs and respective factor incomes generated in all production stages for the provision of the final product. In other words, a value chain can be defined as the total income generated directly and indirectly at all production stages to deliver the final product. This also includes the intermediate goods that the

upstream sectors need for the production of their products, which in turn are the inputs for the five sectors we investigate in this chapter. This calculation is based on the Leontief inverse and the vector of final demands (see Table 16).

In this factor income perspective, we find similar shares for wholesale as in the cost perspective discussed above, which were between 6% and 7% in food and beverages and textiles and 2.6% in construction. This confirms the finding that wholesale trade plays (at least in some cases) a non-negligible role in the respective value chains, which are therefore of similar magnitude to the direct costs shares. However, there are also considerable differences between the cost and the factor income perspective. For example, the share for business services of food and beverages in the factor income perspective is much larger (12.6%) than in terms of direct cost share (7.8%); we find the same for manufacturing industries, while for agriculture the share is lower. This is due to the fact that the goods that the upstream sectors need for the production of intermediate goods are included in their incomes.

## 8.5. TRADE AND TRANSPORT MARGINS ALONG THE VALUE CHAINS

A second way of assessing the role and importance of wholesale trade in production processes along value chains is to consider the difference between the prices of intermediate inputs evaluated in purchasers' and basic prices (see also Figure 65 above), using also information from the valuation matrices. Unfortunately, however, the valuation matrices are only reported (or calculated) for trade and transport margins together.

**Table 17 / Shares of wholesale trade in margins products for EU-27 in 2011, in %**

CPA	Description	Food and		Transport		Construction
		beverages	Textiles	Machinery	equipment	
50	Trade, maintenance and repair services of motor vehicles and motorcycles; retail sale of automotive fuel	8.4	8.9	8.7	8.8	8.5
51	Wholesale trade and commission trade services, except of motor vehicles and motorcycles	48.3	46.1	48.0	48.1	49.3
52	Retail trade services, except of motor vehicles and motorcycles; repair services of personal and household goods	35.4	36.0	36.4	37.7	35.6
60	Land transport; transport via pipeline services	7.5	8.6	6.5	5.0	6.2
61	Water transport services	0.3	0.3	0.2	0.2	0.2
62	Air transport services	0.0	0.0	0.0	0.0	0.0
63	Supporting and auxiliary transport services; travel agency services	0.2	0.1	0.2	0.2	0.2
	Total	100	100	100	100	100

Source: WIOD; own calculations.

Table 17 therefore first provides an overview of the relevance of the wholesale sector, compared to all other sectors where inputs to other sectors are reported as margins, i.e. retail trade and transport. According to this table, wholesale trade accounts for about 50% of all margins related to trade and transport, which is taken as a benchmark when interpreting the next results.

Using the valuation matrices for trade and transport margins and taxes less subsidies, it is possible to calculate the share of trade and transport margins as a share of basic prices – i.e. the additional costs are caused by trade and transport (Table 18).<sup>11</sup> Table 18 indicates that trade and transport margins account for a large share of the difference between basic and purchasers' prices. The unweighted average amounts to between 30% and 35% for the five industries considered. Given that wholesale trade accounts for around half of total transport and trade margins, these figures suggest an additional cost of about 15–17% on top of the purchase in basic prices due to wholesale trade services.

**Table 18 / Trade and transport margins in % of basic prices by product for EU-27, 2011**

CPA	Description	Food and		Transport		
		beverages	Textiles	Machinery	equipment	Construction
1	Products of agriculture, hunting and related services	28	36	39	27	27
2	Products of forestry, logging and related services	64	34	23	54	22
5	Fish and other fishing products; services incidental of fishing	64	.	0	21	22
10	Coal and lignite; peat	8	7	7	14	6
11	Crude petroleum and natural gas, etc.	53	27	106	79	10
12	Uranium and thorium ores	.	.	.	.	.
13	Metal ores	10	13	11	4	13
14	Other mining and quarrying products	29	29	24	34	29
15	Food products and beverages	44	45	52	54	46
16	Tobacco products	56	450	78	150	59
17	Textiles	45	47	54	57	58
18	Wearing apparel; furs	85	74	93	88	100
19	Leather and leather products	78	63	74	65	76
20	Wood and products of wood and cork (except furniture), etc.	31	25	27	24	29
21	Pulp, paper and paper products	30	27	27	26	29
22	Printed matter and recorded media	32	37	31	29	31
23	Coke, refined petroleum products and nuclear fuels	9	12	8	7	11
24	Chemicals, chemical products and man-made fibres	36	37	38	40	38
25	Rubber and plastic products	21	23	21	17	22
26	Other non-metallic mineral products	33	31	32	33	33
27	Basic metals	13	17	13	12	13
28	Fabricated metal products, except machinery and equipment	17	16	15	14	16
29	Machinery and equipment n.e.c.	25	26	20	20	26
30	Office machinery and computers	52	45	50	31	45
31	Electrical machinery and apparatus n.e.c.	26	21	20	19	22
32	Radio, television and communication equipment and apparatus	35	28	26	31	43
33	Medical, precision and optical instruments, watches and clocks	39	40	59	42	44
34	Motor vehicles, trailers and semi-trailers	38	37	30	21	46
35	Other transport equipment	16	13	18	10	14
36	Furniture; other manufactured goods n.e.c.	67	64	81	66	73
37	Secondary raw materials	17	28	8	18	14
40	Electrical energy, gas, steam and hot water	1	0	0	0	1
41	Collected and purified water, distribution services of water	0	0	0	0	0
45	Construction work	0	0	0	0	0

Source: WIOD SUTs; own calculations.

Finally, Table 19 indicates the products for which these wholesale services are relevant. For example, in the food and beverages industry almost 40% of trade and transport services margins are spent on purchasing goods from the agricultural sector, and 45% are due to intra-industry flows. For the textiles

<sup>11</sup> This table reports only the shares for purchases of intermediates of commodities which are the users of trade and transport services.

industry, trade and transport margins are mostly spent on purchasing wearing apparel, leather and chemicals. An analogous interpretation holds for the other industries; these numbers mostly reflect the sourcing structure of intermediate products.

**Table 19 / Trade and transport margins in % of total margins by product for EU-27, 2011**

		Food and beverages	Textiles	Machinery equipment	Transport Construction	
1	Products of agriculture, hunting and related services	38	2	0	0	1
2	Products of forestry, logging and related services	0	0	0	0	0
5	Fish and other fishing products; services incidental of fishing	2	0	0	0	0
10	Coal and lignite; peat	0	0	0	0	0
11	Crude petroleum and natural gas, etc.	0	0	0	0	0
12	Uranium and thorium ores	0	0	0	0	0
13	Metal ores	0	0	0	0	0
14	Other mining and quarrying products	0	0	0	0	4
15	Food products and beverages	46	1	0	0	0
16	Tobacco products	0	0	0	0	0
17	Textiles	0	57	0	2	1
18	Wearing apparel; furs	0	17	0	0	1
19	Leather and leather products	0	2	0	0	0
20	Wood and products of wood and cork (except furniture), etc.	1	0	1	1	10
21	Pulp, paper and paper products	3	1	1	0	1
22	Printed matter and recorded media	1	1	1	0	1
23	Coke, refined petroleum products and nuclear fuels	0	0	0	0	2
24	Chemicals, chemical products and man-made fibres	2	12	4	4	4
25	Rubber and plastic products	2	1	5	6	8
26	Other non-metallic mineral products	2	0	1	2	35
27	Basic metals	0	0	11	7	3
28	Fabricated metal products, except machinery and equipment	1	1	19	9	13
29	Machinery and equipment n.e.c.	1	2	36	6	6
30	Office machinery and computers	0	0	1	0	0
31	Electrical machinery and apparatus n.e.c.	0	0	8	5	8
32	Radio, television and communication equipment and apparatus	0	0	4	2	2
33	Medical, precision and optical instruments, watches and clocks	0	0	3	3	1
34	Motor vehicles, trailers and semi-trailers	0	0	3	45	0
35	Other transport equipment	0	0	0	5	0
36	Furniture; other manufactured goods n.e.c.	0	1	2	3	2
37	Secondary raw materials	0	0	0	0	0
40	Electrical energy, gas, steam and hot water	0	0	0	0	0
41	Collected and purified water, distribution services of water	0	0	0	0	0
45	Construction work	0	0	0	0	0

Source: WIOD SUTs; own calculations.

## 8.6. ANALYSIS OF FIVE WHOLESALE SUB-SECTORS IN DETAIL

As a second approach, one can look at the main actors in the five sectoral value chains and their relevant economic characteristics. This will be done by analysing the wholesale trade sub-sectors relevant to the five aforementioned industries in more detail, by drawing on information from the Eurostat SBS Database. In addition, we use Orbis data to identify the main actors in each of these detailed wholesale trade sectors.

These five wholesale trade sectors include: sale of motor vehicles (NACE 45.1), wholesale of food, beverages & tobacco (NACE 46.3), wholesale of clothing and footwear (NACE 46.42), wholesale of other machinery, equipment and supplies (NACE 46.6) and wholesale of construction material, plumbing and heating equipment (including two sub-sectors: 46.73 Wholesale of wood, construction materials and sanitary equipment and 46.74 Wholesale of hardware, plumbing and heating equipment and supplies). Table 20 provides the main indicators for these five sub-sectors for the EU-28; Table 21 gives some derived structural indicators.

**Table 20 / Main structural indicators – five wholesale sub-sectors, EU-28, 2013**

Sector	No. of enterprises	Turnover	Value added	Gross op. surplus	Gross investment	Employment in 1,000
		million EUR	million EUR	million EUR	million EUR	
<b>45.1 Sale of motor vehicles</b>	206,684	715,332	67,781	22,417	9,153	1,454
<b>46.3 W. of food, beverages and tobacco</b>	211,023	986,231	85,236	36,477	8,222	1,786
<b>46.42 W. of clothing and footwear</b>	61,021	132,652	22,992	11,776	1,454	366
<b>46.6 W. of other machinery, equipment and supplies</b>	170,648	462,037	84,660	29,081	6,814	1,335
<b>46.73 &amp; 46.74 W. of construction material, plumbing and heating equipment</b>	159,662	391,981	60,639	18,524	6,208	1,368

Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

**Table 21 / Main derived structural indicators – five wholesale sub-sectors, EU-28, 2013**

Sector	Apparent productivity	Wage-adjusted productivity	Profitability	Investment per person	Firm size
	1,000 EUR	%	%	1,000 EUR	p.p. per firm
<b>45.1 Sale of motor vehicles</b>	47	133	3.1	6.3	7.0
<b>46.3 W. of food, beverages and tobacco</b>	48	160	3.7	4.6	8.5
<b>46.42 W. of clothing and footwear</b>	63	183	8.9	4.0	6.0
<b>46.6 W. of other machinery, equipment and supplies</b>	63	141	6.3	5.1	7.8
<b>46.73 &amp; 46.74 W. of construction material, plumbing and heating equipment</b>	44	132	4.7	4.5	8.6

Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

Looking first at the importance of individual sub-sectors in terms of employment, wholesale of food employed the largest number of persons – nearly 1.8 million. Sale of motor vehicles, wholesale of machinery and construction material all have about 1.4 million persons employed, while the figure for wholesale of clothing is comparatively small (370,000 persons). In terms of value added, wholesale of food and wholesale of machinery generate the highest values (EUR 85,000 million), followed by the sale of motor vehicles and wholesale of construction material, while again the sub-sector wholesale of clothing is the smallest (EUR 23,000 million).

The largest number of enterprises can be found in wholesale of food (211,000), as well as in the sale of motor vehicles (207,000). The figures are slightly smaller for wholesale of other machinery (170,000)

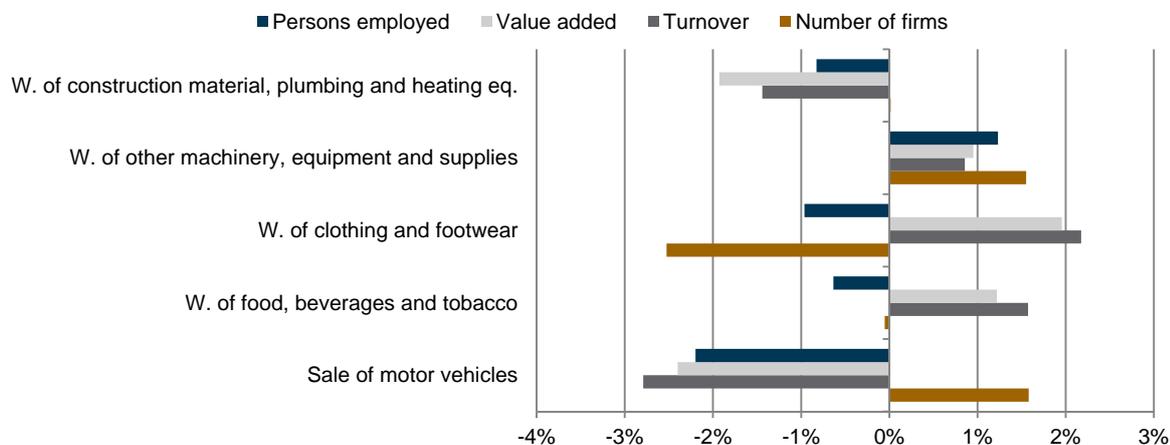
and wholesale of construction material (160,000), and again the smallest number is found in wholesale of clothing (61,000). With regard to firm size (persons employed per firm), we find the largest firms in wholesale of construction material and also wholesale of food, employing on average 8.5 people; the smallest in wholesale of clothing, with an average of six people. Still this is above the average of aggregated wholesale (NACE 46) with 5.7 persons per firm.

Regarding apparent labour productivity (gross value per person employed), this is exceptionally high in wholesale of clothing and of machinery, both with EUR 63,000 per person. The other three sub-sectors exhibit productivity levels below that of aggregated wholesale, which has a value of EUR 54,000 per person. The lowest productivity level is measured for wholesale of construction material, at EUR 44,000 per person. Looking at wage-adjusted labour productivity, wholesale of clothing still exhibits the highest value (183%), now followed by wholesale of food (160%).

Profitability (gross operating surplus rate) differs considerably across sub-sectors. The highest value is found for wholesale of clothing (8.9%), which is more than double that of aggregated wholesale (3.6%). Wholesale of machinery also shows a high profitability (6.3%), and wholesale of construction material (4.7%) is still above the aggregated wholesale figure. The profitability of wholesale of food is comparatively low (3.7%), and that of sale of motor vehicles is the lowest (3.1%). Investment per person was highest in sale of motor vehicles in 2013 (EUR 6,300 per person) and lowest for wholesale of clothing (EUR 4,000 per person). The other three sub-sectors lay in between.

Looking at trends over the period 2008–2013 in Figure 66, we can see that wholesale of construction material and sale of motor vehicles exhibited negative annual growth rates for employment, value added and turnover during this period, still in the aftermath of the global financial crisis. Actually, sale of motor vehicles was most negatively affected. In contrast, value added and turnover grew in the other three sub-sectors, particularly in wholesale of clothing (about 2% annually). However, employment increased only in wholesale of machinery, but declined in wholesale of clothing and of food. Overall, productivity rose only in the latter two sub-sectors.

**Figure 66 / Average annual growth rate of value added and employment in five selected wholesale sub-sectors, EU-28, 2008–2013**



Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

Summarising the information for the individual sub-sectors, we find the following characteristics:

- › The sub-sector **sale of motor vehicles (NACE 45.1)** employs about 1.4 million people and generates a value added of EUR 68,000 million. A comparatively large number of companies exist in this sub-sector (207,000). Apparent labour productivity is below that of the aggregate wholesale sector. The sub-sector shows the lowest profitability rate of 3.1%. In 2013, investment per person was highest in this sub-sector (EUR 6,300 per person). Looking at trends between 2008 and 2013, the sub-sector exhibited the largest yearly decline in terms of employment, value added and turnover, as it was still suffering from the global financial crisis.
- › The sub-sector **wholesale of food, beverages and tobacco (NACE 46.3)** is the largest sub-sector of the five selected ones, in terms of both employment and value added. The sub-sector employs 1.8 million persons in the EU-28 and generates value added of EUR 85,000 million. It also exhibits the largest number of companies (211,000). The firm size (persons employed per firm) is among the largest, with firms employing on average 8.5 people. Apparent labour productivity is below that of the aggregate wholesale sector. However, wage-adjusted labour productivity is definitely higher (160%). Between 2008 and 2013, annual growth rates of value added and turnover reached more than 1%. As employment fell, productivity increased in this sub-sector.
- › The sub-sector **wholesale of clothing and footwear (NACE 46.62)** is the smallest sub-sector of the five selected, in terms of both employment and value added. It employs 370,000 persons and creates value added of EUR 23,000 million. It has the smallest number of companies (61,000) and the smallest firm size (persons employed per firm), with firms employing on average six people. Apparent labour productivity (gross value per person employed) is exceptionally high, at EUR 63,000 per person; also wage-adjusted labour productivity is the highest of the five sub-sectors selected. The sub-sector exhibits an especially high profitability rate of 8.9%, which is more than double that of aggregated wholesale (3.6%). Investment per person was lowest in this sub-sector (EUR 4,000 per person). Between 2008 and 2013, annual growth rates of value added and turnover reached about 2%, the highest increase among the five sub-sectors. As employment fell, so productivity increased in this sub-sector.
- › The sub-sector **wholesale of other machinery, equipment and supplies (NACE 46.6)** belongs to the largest sub-sectors in terms of value added, with EUR 85,000 million, and it employs approximately 1.4 million persons. It numbers about 170,000 enterprises. The sub-sector's apparent labour productivity (gross value per person employed) is exceptionally high, at EUR 63,000 per person, and its profitability rate is the second highest (6.3%). Between 2008 and 2013, value added and turnover grew annually. This was also the only sector where employment increased. However, as the growth rate for value added was less than for employment, productivity declined.
- › The sub-sector **wholesale of construction material, plumbing and heating equipment (NACE 46.73 & 46.74)** employs about 1.4 million people and generates a value added of EUR 60,000 million. There are about 160,000 enterprises in this sub-sector. Firm size (persons employed per firm) is among the largest, with firms employing on average 8.6 people. Apparent labour productivity is below that of the aggregate wholesale sector, and is the lowest of the five selected sub-sectors. The profitability rate (4.7%) is still above that of aggregated wholesale (3.6%). Looking at trends between

2008 and 2013, the sub-sector exhibited negative growth rates in terms of employment, value added and turnover, as it was still suffering from the global financial crisis.

Table 26 in the Annex shows the largest companies for the five selected wholesale sub-sectors.

## 8.7. SUMMARY

This section has provided selected evidence on the role and magnitude of wholesale trade in the EU and individual Member States, based on information provided by supply and use and input-output tables. Wholesale services (similar to retail and transport services) are treated as the margins created by these industries to provide products to the user. Various information concerning magnitudes can be derived from the supply and use tables, as well as from the respective valuation matrices.<sup>12</sup>

- › First, the provision of wholesale services by the manufacturing industries as a ‘secondary product’ plays a minor role (as reported in the tables, which do not include in-house provision of such services). Thus, wholesale services are mainly offered by the trade sector. This is another indication that the prediction of disintermediation seems to overstate the actual development, because disintermediation would mean that manufacturing firms or retail trade increasingly compete with wholesale firms in the wholesale market.
- › Second, trade and transport margins account for about 15% of the total supply of manufacturing products in purchasers’ prices. This magnitude has been relatively stable over time; however, significant differences can be observed across countries.
- › Third, wholesale trade accounts for about 5% of total costs (as a percentage of gross output) for manufacturing industries; again this share has been relatively stable over time on average, though differences (both in magnitude and trends) can be observed. Related to this is the fact that about 12% on top of the cost of the purchase of intermediates in basic prices (in manufacturing and construction) can be attributed to wholesale trade.
- › Fourth, these magnitudes also apply to different value chains, though there are some differences in the figures. For example, considering the five selected value chains, the direct cost share of wholesale trade in food and beverages and textiles is about 6–7% of gross output, whereas in machinery and transport equipment it is about 4%; in construction this is about 2.5% (for this industry, however, the share of intermediates in gross output is significantly lower). These figures are similar if we consider value added created along the value chains (i.e. direct and indirect costs).

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<sup>12</sup> These results are based on the WIOD data. It should be noted that more recently some national statistical offices have started to provide use tables in basic prices and the valuation matrices which might be used in further investigations.

## 9. Case study: Wholesale of mining, construction and civil engineering machinery

In order to go behind the highly aggregated figures for the wholesale trade sector we presented in the previous chapters, a case study of the sub-sector 'Wholesale of mining, construction and civil engineering machinery' was requested under the terms of reference. This case study is carried out at the member-state, as well as the EU level. The purpose of the case study is to analyse the characteristics and performance of this sub-sector, its similarities and differences with respect to the aggregate wholesale sector, and the machinery wholesale sector more specifically. In addition, this case study analyses the European and global value chains to which the sub-sector belongs, the upstream and downstream players and the extent of vertical integration. Finally, an assessment is made about the degree of realisation of a single market in this value chain.

### 9.1. DESCRIPTION AND DELIMITATION OF THE SECTOR

For this case study, the sector 'Wholesale of mining, construction and civil engineering machinery' is delimited to sector 46.63 in the NACE rev. 2 classification. That comprises wholesale activities for a wide range of construction, mining and civil engineering machinery, in a variety of sizes, technologies and usage areas, varying from small machines like vibratory plates to heavy equipment like 400-tonne dump trucks. Across countries, there are also differences in machine preferences and in the way distribution is organised. There is a general trend towards increased complexity of machines, with the integration of mechanics, electronics and data communication; this has an impact on the skills level of machine operators and maintenance workers. This heterogeneity of product types (even within companies) makes it difficult to develop a clear picture of this sector.

The machinery is mainly used by construction companies and mining operators, though the latter group is of only minor importance in Europe. Mining – in addition to construction – employs specialised machinery like drilling machines, rock drilling machines, crushing stations, underground loaders and haul trucks. It may therefore come as no surprise that the evolution in the value chain is largely driven by construction activities in Europe.

The different machines can be divided into more than 100 types. According to McKinsey & Company (2016), there are eight large segments in construction and civil engineering machinery; these are summarised in the matrix below.

Most mining, construction and civil engineering machinery is produced in low volumes. Some types are produced in the hundreds of thousands annually (worldwide); others are produced in much lower quantities (from only one to dozens annually). This distinguishes their manufacturers from the car and heavyweight and lightweight commercial vehicles industry, which is characterised by mass production (millions annually per brand). The high-volume machines in the mining and construction machinery industry are generally more commoditised, with higher competition mainly from Asian manufacturers.

**Figure 67 / Categorisation of construction equipment**

<b>Heavy earthmoving equipment</b>	 Dump truck and scraper	Articulated dump truck, rigid dump truck, motor scraper	<b>Concrete equipment</b>	 Concrete pump	Truck-mounted, stationary, truck-mixer concrete pump combination
	 Dozer and grader	Crawler dozer, wheeled dozer, motor grader		 Truck mixer	Standard truck mixer, semi-trailer mixer
	 Loader	Crawler loader, wheeled loader, backhoe loader		 Placing/distribution system	Stationary system, tower system
	 Excavator	Crawler excavator, wheeled excavator		 Batching plant	Horizontal mixing plant, mixing tower
<b>Compact earthmoving equipment</b>	 Excavator	Compact excavator	<b>Civil engineering equipment</b>	 Tunneling	Tunnel boring machine, partial-face excavation, auger boring, etc.
	 Dumper	Wheel dumper, track dumper		 Pipe and cable laying	Pipe layer, trencher
	 Loader	Wheeled loader, skid-steer loader		 Piling	Piling rig (vibrohammer, impact driving system, soil mixing system, etc.)
<b>Road construction and compaction equipment</b>	 Asphalt construction	Road paver, material feeder, screed, roller, slipform paver	<b>Lifting equipment</b>	 Surface drilling	Rotary drill rig, surface top hammer, etc.
	 Asphalt mixing plant	Batch plant, continuous plant, cold mix plant		 Crane	Tower crane, mobile crane
	 Light compaction	Rammer, vibratory plate, roller		 Hoist	Rope hoist, material hoist, personnel and material hoist, transport and work platform
	 Cold milling, stabilizing, recycling	Cold milling machine, cold recycler and soil stabilizer, binding agent spreader, hot recycler		 RTL	Masted, telescopic RTL
<b>Crushing and screening equipment</b>	 Crushing	Stationary crusher (jaw, cone, gyratory, HS, VS impactor), mobile crusher, aggregate plant	<b>Attachments</b>	 Non-hydraulic attachments	Bucket, blade, ripper, fork, bit, etc.
	 Screening	Stationary screen (stratification, free-fall, roller), mobile screens, aggregate plant		 Hydraulic attachments	Auger, grapple, demolition tools, breaker and hammer, etc.

Source: McKinsey & Company (2016).

In contrast to many other value chains analysed earlier in this report, sector NACE 46.63 integrates both wholesale and retail activities in one entity, as this type of machinery is only sold and used in a business-to-business relationship. In this sense, wholesale companies are the only link between the producer of machinery and the end user. Most of the wholesalers in NACE 46.63 are active in selling new and used equipment (dealership) and in the maintenance of the machinery (after sales); often they also integrate rental of the machinery in their activities.

In the NACE classification, there is a dedicated sector NACE 77.32, which specifically addresses the rental and leasing of construction and civil engineering machinery and equipment. Companies in this sector are to some extent similar to those in NACE 46.63 – the topic of this case study (because of the renting activities) – but sector NACE 77.32 will not be considered in this case study. ERA, the European Rental Association, estimates that there were 14,650 rental companies (without operators) in 2011, employing almost 120,000 people. The total size of the EU equipment rental market was estimated to be EUR 23.8 billion in 2015 (ERA 2015). The United Kingdom, France and Germany accounted for almost 65% of the total rental turnover in 2013. The equipment rental market growth is quite similar to the growth of the wholesale of construction and mining equipment.

## 9.2. COMPETITIVENESS OF THE SECTOR

In general, competitiveness within the sector of wholesale of mining, construction and civil engineering machinery is largely driven by the activities of the construction (and mining) industry. Due to the downturn in large infrastructure projects during to the economic crisis of 2008/09, wholesalers of this type of machinery saw their economic performance correspondingly reduced. Typically, the impact was felt most strongly in the Southern EU Member States, such as Greece, Spain and Italy, with considerable losses in employment and economic activity in the sector. The North-Western EU Member States, such as Germany, France, the UK, but also Poland were also affected by the crisis, albeit on a more modest level, but they showed somewhat better recovery results.

Compared to manufacturers of mining, construction and civil engineering machinery, wholesalers were less vulnerable to volatility because of the provision of maintenance and after-sales services. These activities provided a buffer to any immediate downturn in investments. Since machinery of this type are investment goods, with increasing specialisation and technological complexity, they require regular maintenance and repair. Competition from Asian manufacturers has increased in recent years, and has mainly had an impact on the competitive position of European manufacturers. However, wholesalers also feel the impact of increased competition. In the past, second-hand machines were price-competitive compared to new machinery, but cheap new Chinese machinery has meant that exports have shifted more towards Africa. The recent downturn in exports to Russia (because of the trade boycott) and the slowdown in emerging countries are not yet reflected in the figures below, but it is possible that these developments will also negatively influence sales of second-hand machines by wholesalers.

Indicators of economic performance are closely linked to the local presence of large EU sales offices and distribution centres with external trade in parts and machinery within and outside the EU. Particularly for Belgium and the Netherlands, the presence of the EU headquarters of major manufacturers influences their importance in the EU. In the next section, the structure of the European sector in terms of number and size of companies, and their economic performance in terms of value added, turnover, gross operating surplus, labour productivity and price level will be mapped.

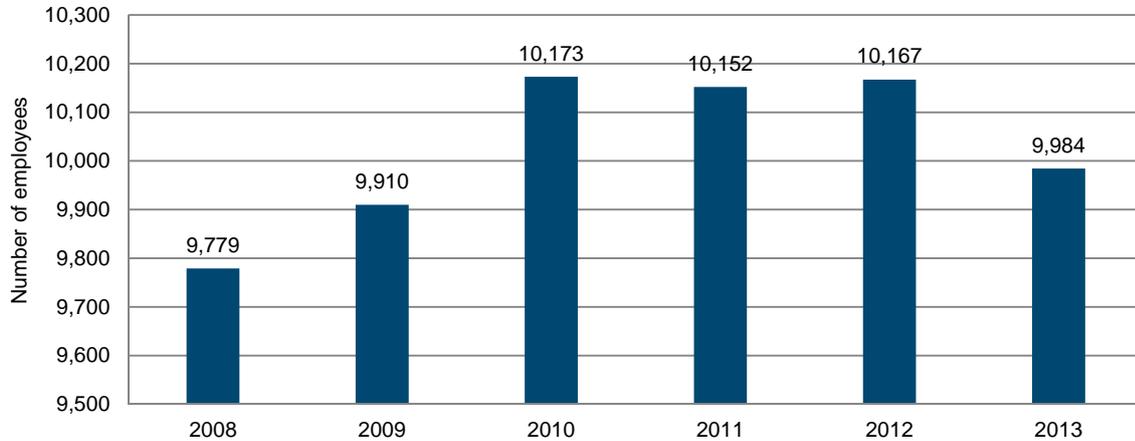
### 9.2.1. Number and size of companies

In total, the sector accounted for approximately 10,000 wholesale enterprises across Europe in 2013;<sup>13</sup> this figure had increased by 2.1% since 2008, thanks to emerging businesses mainly in Poland, Germany and the Netherlands. In terms of total employment, almost 81,000 Europeans were professionally active in wholesale of mining, construction and civil engineering equipment in 2013. In contrast to the modest growth in the number of enterprises, employment in the sector decreased significantly, by almost 12% compared to 2008.

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<sup>13</sup> According to Eurostat Business Statistics data. Orbis data indicate 18,000 enterprises active in the sector but differences can be attributed to varying registration criteria and categorisation.

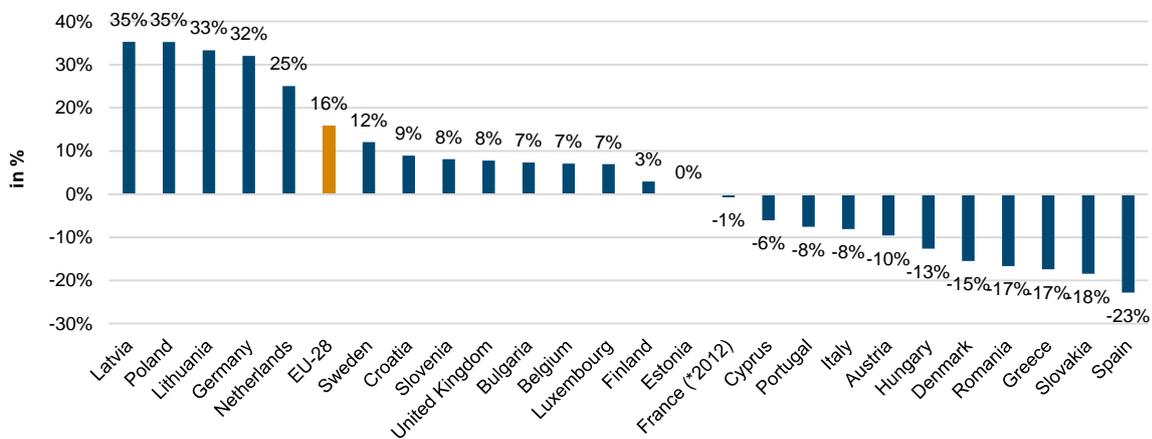
**Figure 68 / Number of employees in the EU-28 (2008–2013) – wholesale of mining, construction and civil engineering machinery**



Source: Eurostat, Structural Business Statistics, own calculations.

This general trend towards more and smaller wholesale organisations, however, masks considerable differences between the EU Member States. Looking at Figure 69 and Figure 70, one can observe that the majority of EU Member States, headed by some Eastern European Member States such as Latvia, Poland and Lithuania, have seen a steady increase in emerging wholesale businesses. This may be linked to the fact that – because of a focus on limiting the downtime of machines – there is a need to have a dense network of service centres, in order to be able to intervene rapidly in case of machine failure. In Eastern European Member States, the increased use of machines (because of an increase in labour costs) and the need for a denser dealer network may be one explanation for the increase in the number of companies. In terms of employment, however, just three countries are responsible for the positive growth seen in the EU (Germany, Belgium and France). This implies that the steady increase in the number of enterprises does not necessarily translate into more employment.

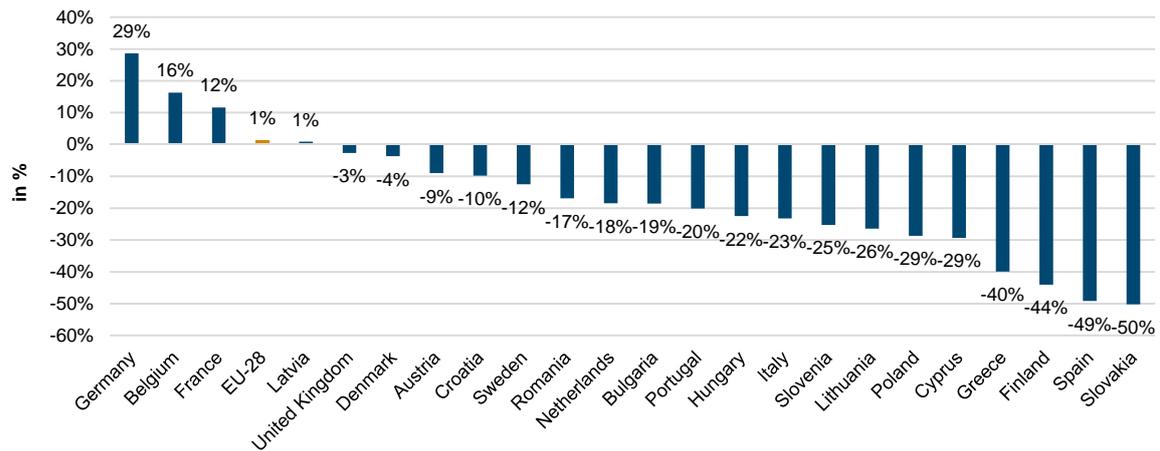
**Figure 69 / Growth in the number of enterprises, wholesale of mining, construction and civil engineering machinery, 2008–2013**



Source: Eurostat, Structural Business Statistics, own calculations.

There are also differences between segments. Segments where larger volumes are traded, like earthmoving equipment, excavators and wheel loaders, tend to increase in scale, while low-volume segments are likely to remain small.

**Figure 70 / Growth in the number of employees, wholesale of mining, construction and civil engineering machinery, 2008–2013**



Source: Eurostat, Structural Business Statistics, own calculations.

Another factor relating to the increase in new, smaller wholesale enterprises is the observed tendency for general contractors to focus increasingly on core activities. This leads to outsourcing of the maintenance and repair of their machines. The higher complexity of machines (more electronics, hybrid power) may also force machine owners to outsource maintenance and repair.

As Figure 70 shows, the Southern European countries (such as Greece, Italy and Spain) have experienced severe losses in terms of employment: almost 50% of the sector workforce in some cases. This can be attributed to the housing crisis and its consequences for construction demand, which drives evolution in the wholesale of mining, construction and civil engineering machinery industry.

In general, Italian wholesalers represent the largest share of European wholesale enterprises, followed by Germany, France, Poland, Spain and the UK. Together, these countries account for half of the total amount of European wholesale enterprises and employ over 70% of the total workforce active in the sector, although considerable differences exist between these countries in terms of the average number of employees per enterprise. Italian wholesalers are generally smaller, employing on average 5.5 people, whereas German wholesalers have on average 15 employees. This may be partly explained by the presence of large dealer groups and the European headquarters of big brands, such as Caterpillar, Hitachi, Komatsu, etc., in Germany, the UK and France (see Table 22 and Table 23). McKinsey & Company also indicate the common presence in Italy of local crane manufacturers, whose core business is more focused on tailor-made machinery, in close partnership (and co-creation) with specific customers to meet their needs or region-specific requirements (McKinsey & Company 2016).

Controlling for the population size of EU Member States, one can observe that the sector is relatively less important (measured by the number of enterprises) in South-Eastern Member States such as Romania, Slovakia, Croatia and Hungary, than in North-Western Member States (see Figure 73). This

may be linked to the lower importance of construction and mining machinery in countries with lower labour costs.

**Table 22 / Ten largest EU firms (number of employees) in wholesale of mining, construction and civil engineering machinery, 2014**

	Company name	Country	Link to manufacturer
1	Zeppelin GmbH	DE	CAT dealer group, also active in Austria, Czech Republic and Slovakia
2	Bergerat Monnoyeur	FR	CAT dealer group, also active in Belgium, Luxembourg, Poland and Romania
3	Hitachi Construction Machinery (Europe) N.V.	NL	EU headquarters of Japanese manufacturer Hitachi
4	Xcmg Europe GmbH	DE	EU headquarters of Chinese manufacturer XCMG
5	Compagnia Generale Trattori C.G.T.	IT	CAT dealer
6	Kiesel GmbH	DE	Hitachi dealer in Germany
7	Swecon Anlaggningsmaskiner AB	SE	Volvo dealer group, also active in Germany and the three Baltic countries
8	Schlueter Baumaschinen GmbH	DE	Komatsu dealer in Germany
9	Palfinger GmbH	DE	German sales and service subsidiary of Palfinger, AT
10	Pon Equipment AB	SE	CAT dealer group, also active in the Netherlands and Denmark

Source: Orbis.

Table 23 below summarises the dealer distribution networks in Europe for four major brands sold in Europe. Belgium and the Netherlands are attractive locations for multinational original equipment manufacturers (OEMs) to host their distribution centre or European (after)sales office. This is because of those countries' central location close to the sea (since heavy machines are largely transported by boat) and probably also because of their attractive fiscal regimes for multinationals. The presence of the European headquarters of Caterpillar, Komatsu and Hyundai in Belgium and Hitachi in the Netherlands is therefore an explanation for the importance in the indicators discussed in this chapter.

It comes as no surprise that Caterpillar, as the largest manufacturer worldwide, has the densest network, often with one large national dealer and a countrywide network of service points. These large independent CAT-dealers are often present in different countries and are easily recognisable as being Caterpillar dealers, since the look and feel of their websites are similar to the corporate CAT website. Most of them only sell, maintain and repair Caterpillar machines. Dealerships are, however, not exclusive, in the sense that more than one dealer can operate in the same country for the same brand.

Volvo dealers are equally easily recognisable and are also dedicated to one brand, while dealers in Komatsu and Hitachi often offer more than one brand in their portfolio and are less recognisable as being Komatsu or Hitachi dealers. The lower the dealers are in the top 50 ranking, the more brands they generally distribute. The largest dealer networks are heavily integrated into the value chains of the large manufacturers, and most of them have already been dealers for over 50 years. On the one hand, this makes them vulnerable; but on the other hand, they have built up know-how and strong relationships with customers, and this makes it difficult to break the partnership.

**Table 23 / Distribution network of the four largest construction and mining machinery brands in Europe**

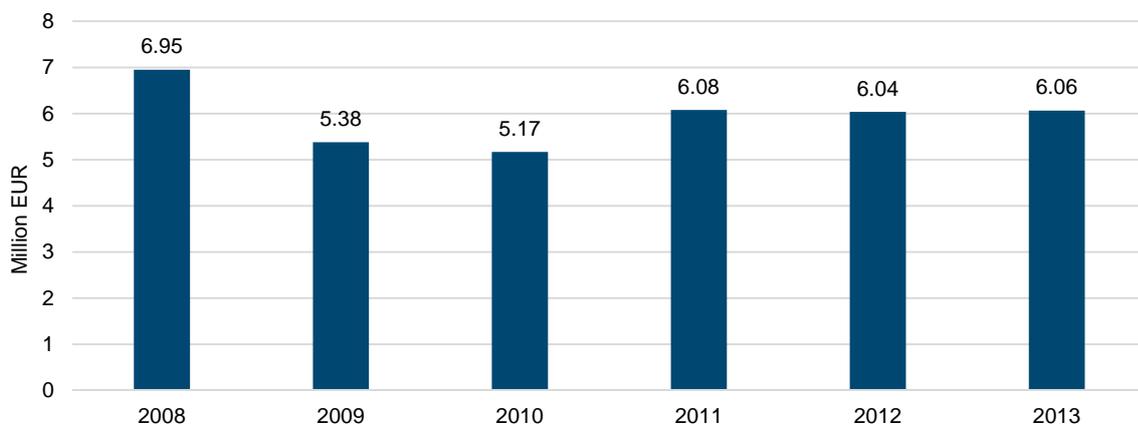
<b>Caterpillar</b>		
European sales headquarters	Caterpillar SARL in Geneva (CH)	
	Caterpillar Distribution Services Europe in Grimbergen (BE)	BE
Major operations	Manufacturing	
	Sales	
	Service	
No. of dealers in major countries	Germany	43 (Zeppelin)
	France	50 (mainly Bergerat Monnoyeur)
	UK	46 (Finning)
	Italy	50 (mainly CGT)
	Spain	27 (Finanzauto)
	Poland	22 (mainly Bergerat Monnoyeur)
	Benelux	15 (Pon Equipment, Bergerat Monnoyeur, ...)
	Sweden	7 (Pon Equipment)
<b>Komatsu</b>		
European sales headquarters	Komatsu Europe International N.V. in Vilvoorde (BE)	
Major operations	Manufacturing	
	Sales	
	Service	
No. of dealers in major countries	Germany	37 (Schlüter Baumaschinen, GP Baumaschinen, ...)
	France	33 (Komatsu France, Mazeau, ...)
	UK	13 (Marubeni-Komatsu, Ernest Doe & Sons, ...)
	Italy	10
	Spain	2
	Poland	1
	Benelux	3
	Sweden	2
<b>Hitachi</b>		
European headquarters	Hitachi Construction Machinery (Europe) NV in Amsterdam (NL)	
Major operations	Manufacturing	
	Sales	
	Service	
No. of dealers in major countries	Germany	43 (mainly Kiesel)
	France	16 (Teramat, ...)
	UK	3
	Italy	7 (SCAI)
	Spain	3
	Poland	1
	Benelux	16
	Sweden	1
<b>Volvo Construction Equipment</b>		
European headquarters	Volvo Construction Equipment AB in Eskilstuna (SE)	
Major operations	Manufacturing	
	Sales	
	Service	
No. of dealers in major countries	Germany	5 with multiple offices (Swecon, ...)
	France	9 dealers with multiple offices
	UK	1 with multiple offices (VCE)
	Italy	17 dealers with multiple offices
	Spain	17 (Volmaquinaria, ...)
	Poland	1
	Benelux	2 with multiple offices
	Sweden	1 with multiple offices (Swecon)

Source: Dealer websites and apps of Caterpillar, Komatsu, Hitachi and Volvo Construction equipment.

### 9.2.2. Value added

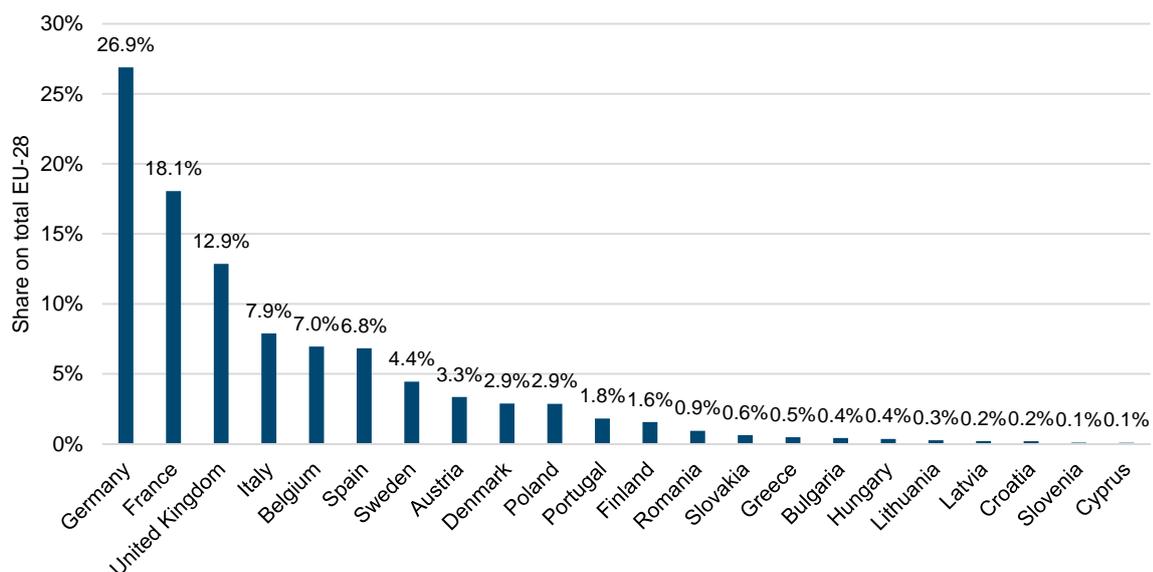
Value added at factor cost calculates the gross income from operating activities after adjusting for operating subsidies and indirect taxes. For the sector in 2013, the total value added at factor cost was EUR 6.1 billion. Compared to 2008, the total value added for wholesaling machinery in mining, construction and civil engineering industries diminished by 13%, with the strongest decline in 2009 and 2010, and a genuine level of stability from 2010 onwards.

**Figure 71 / Value added at factor cost in the EU-28, wholesale of mining, construction and civil engineering machinery, 2008–2013, in million EUR**



Source: Eurostat, Structural Business Statistics, own calculations.

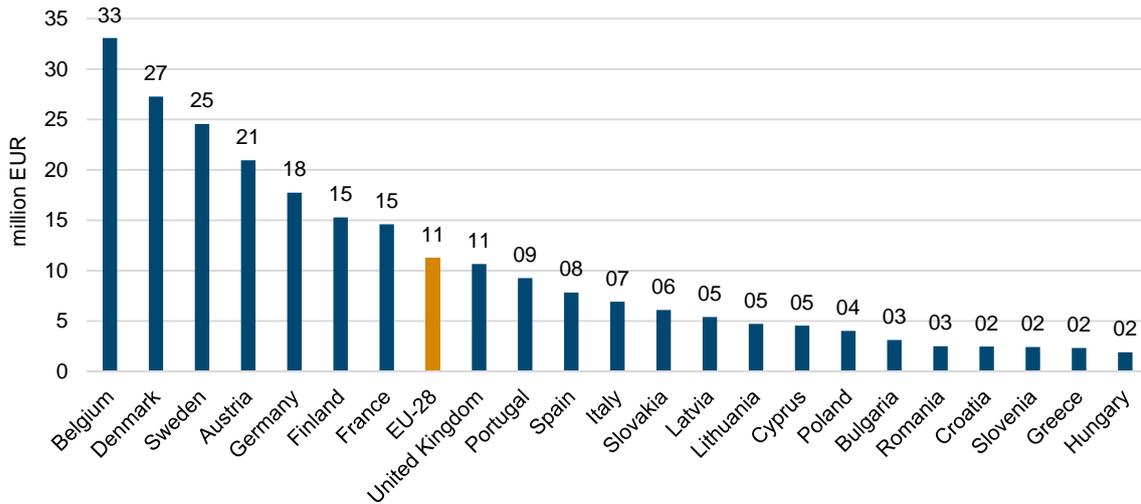
**Figure 72 / Share of different countries in value added at factor cost in the EU-28, wholesale of mining, construction and civil engineering machinery, 2013**



Source: Eurostat, Structural Business Statistics, own calculations.

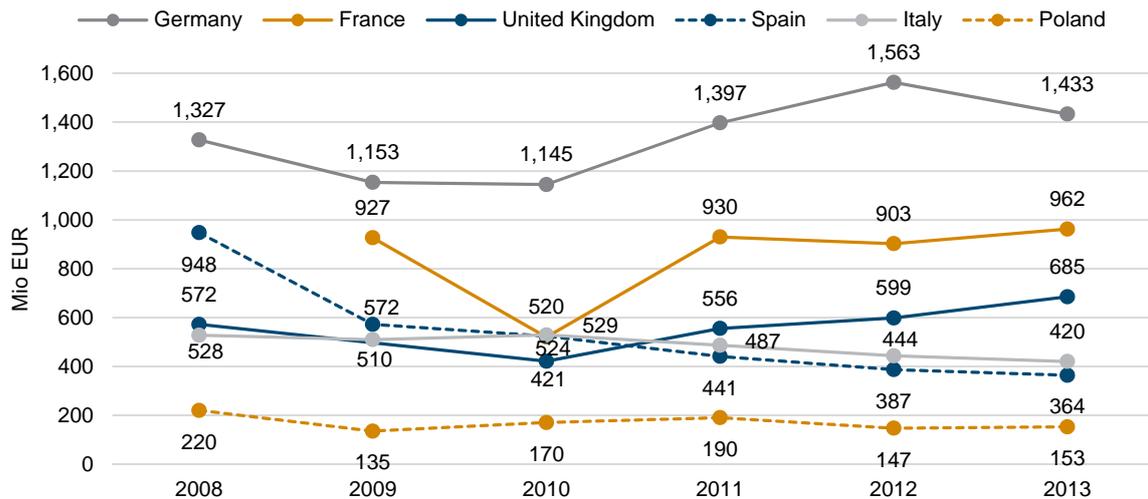
Looking at the different EU Member States, German wholesalers account for more than a quarter of the total value added at factor cost in Europe, mainly due to the numerous and large wholesaler networks active in the country. When controlling for the population size, the Nordic countries and Belgium and Austria top the list in terms of total value added per million inhabitants.

**Figure 73 / Value added (in million EUR) per million inhabitants, wholesale of mining, construction and civil engineering machinery, 2013**



Source: Eurostat, Structural Business Statistics, own calculations.

**Figure 74 / Evolution of value added (2008–2013) for the six largest EU Member States (in million EUR)**



Source: Eurostat, Structural Business Statistics, own calculations.

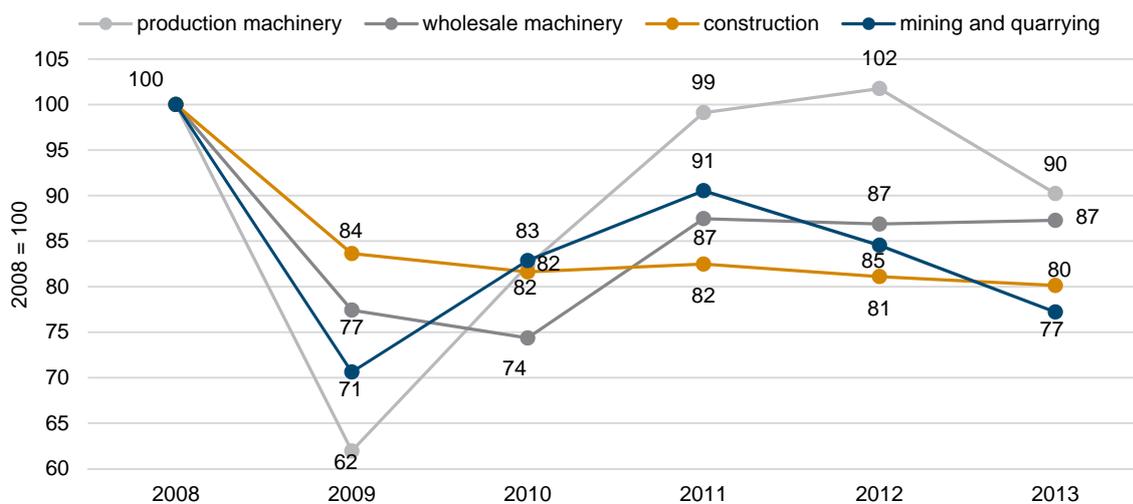
When we look at the more detailed evolution of total value added in the six largest countries in the sector, we can observe that the lasting recession in Italy and Spain means that those countries have hardly recovered from the post-crisis level, whereas France, Germany and the UK show a higher value

added than in 2008, which is linked to the recovery of investment in construction and mining machinery in those countries.

Compared to the production of machinery, the immediate impact of the crisis on wholesale has been less dramatic. Between 2008 and 2013, the level of value added of wholesale first declined to three-quarters of the 2008 level and then recovered somewhat to hover around 87% of the 2008 level.

The relative stability of value added of the wholesale sector (compared to production of machinery) could be attributed to the after-sales services, such as maintenance and repair, which operate as a buffer for the sector. Indeed, these services are less dependent on new investments or on prosperity in the construction industry, and so allowed business to continue more constantly (albeit only in the first years after the crisis). From 2011, the value added of wholesale has stagnated along with the construction industry, whereas the value added of production peaked in 2012 at a higher level than in 2008, only to decline later to 90% of the 2008 level.

**Figure 75 / Evolution of value added for different sectors in the value chain, EU-28, 2008–2013 (2008 = 100)**



Source: Eurostat, Structural Business Statistics, own calculations.

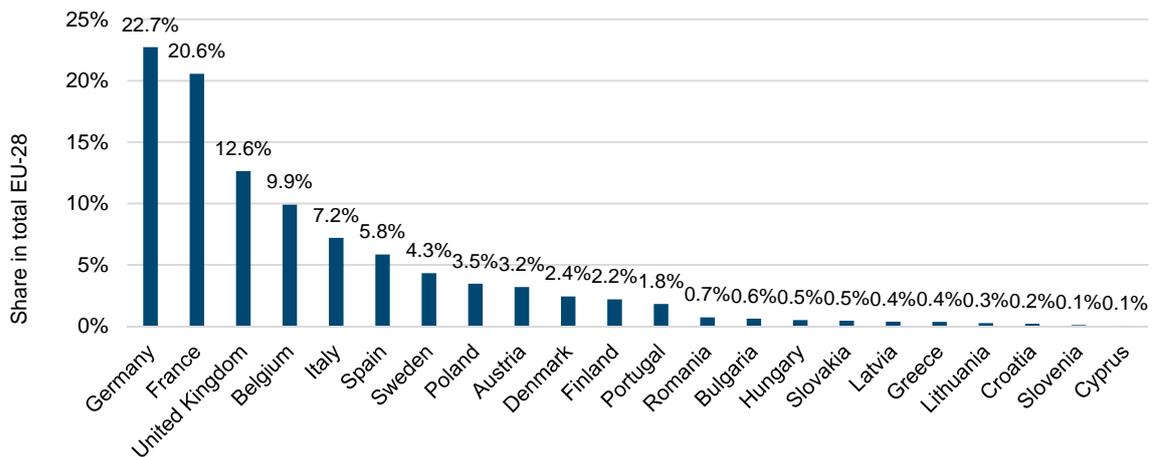
### 9.2.3. Turnover

Turnover comprises the totals invoiced by the observation unit during the reference period, and this corresponds to the total value of market sales of goods and services to third parties. The total turnover of the European sector amounted to EUR 34 billion in 2013, which is a decrease of 20% compared to 2008 turnover. Thus, turnover in the sector has been somewhat harder to re-establish at the 2008 level than value added.

When we look at different levels of turnover in the EU Member States, Germany and France together generate almost half of the total European turnover of the sector, boosted by many of the largest

wholesalers in Europe, such as Bergerat Monnoyeur and Zeppelin (both distributing Caterpillar machines).

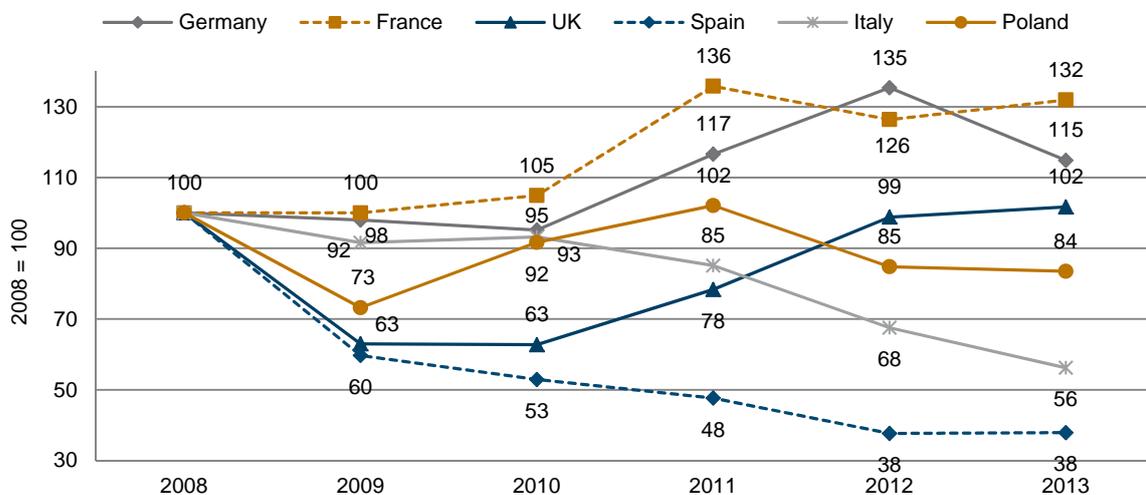
**Figure 76 / Share of different countries in the turnover of the EU-28, wholesale of mining, construction and civil engineering machinery, 2013**



Source: Eurostat, Structural Business Statistics, own calculations.

Controlling for population size, Belgium has by far the largest turnover per million inhabitants, followed by the Nordic countries of Sweden, Denmark and Finland. The level of turnover of Belgian wholesalers is almost twice as high as that in Sweden – a consequence of the importance of the Komatsu and Hyundai EU distribution centres and the Caterpillar spare parts centre in Belgium and the export of parts and machinery to different EU Member States.

**Figure 77 / Evolution in turnover for the six largest EU Member States, 2008–2013 (2008 = 100)**



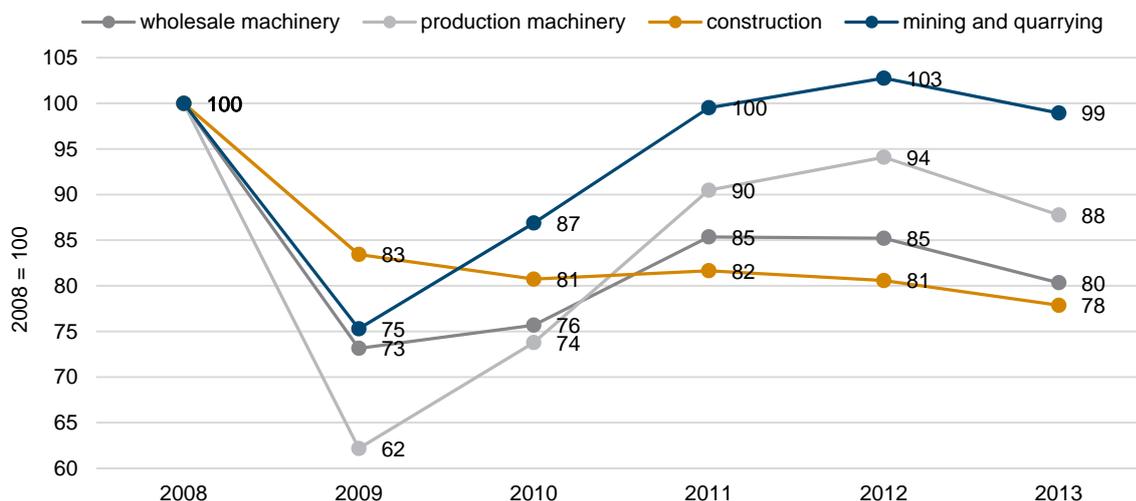
Note: Value for France in 2008 absent, instead the value for 2009 was used as a benchmark.

Source: Eurostat, Structural Business Statistics, own calculations.

When we look at the more detailed evolution of turnover in the six largest countries in the sector, we can observe that the lasting recession in Italy and Spain has meant that those countries have barely recovered from the post-crisis level, whereas France, Germany and the UK have higher turnover than in 2008, which is linked to the recovery of investment in construction and mining machinery in those countries. The recovery of Polish wholesalers seemed to stop in 2012.

Wholesale turnover decreased somewhat less than turnover in the production of machinery after the crisis in 2008, recovering to 85% of the 2008 level in 2011; from there it declined slightly to 80% in 2013. The buffer function of maintenance and after sales in the wholesale business explains this more limited impact of the crisis, although in the longer term these markets do not sufficiently compensate for the loss in sales.

**Figure 78 / Evolution of turnover for different sectors in the value chain in EU, 2008–2013 (2008 = 100)**



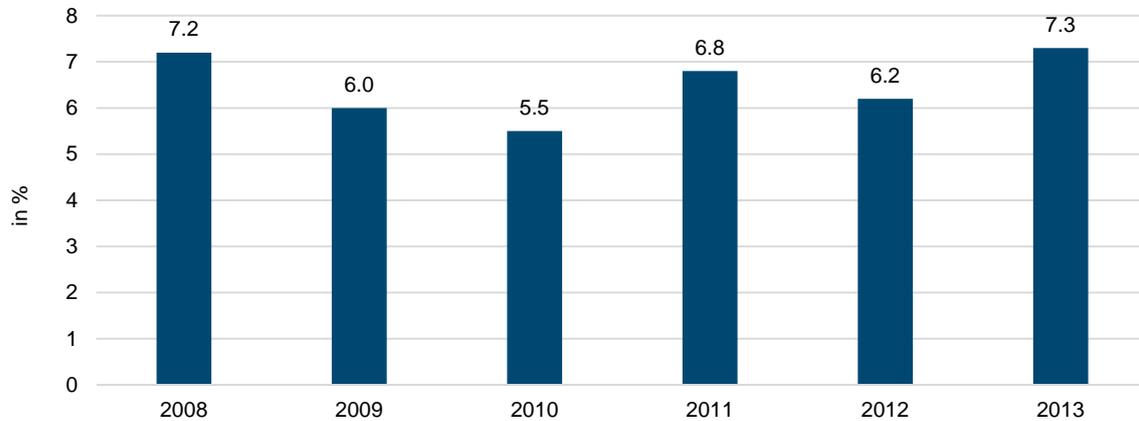
Source: Eurostat, Structural Business Statistics, own calculations.

#### 9.2.4. Gross operating rate

The gross operating rate (GOR) is a third measure of economic performance that mirrors the ratio of gross operating surplus to turnover. Gross operating surplus – or profit – is defined as value added minus personnel costs. It is the surplus generated by operating activities after the labour factor input has been compensated for.

The GOR is the only indicator that shows a slightly higher level for the sector in 2013 than in 2008. As we have seen, the general trend towards smaller firms with fewer employees spurs the operating surplus of wholesalers by decreasing the cost of labour.

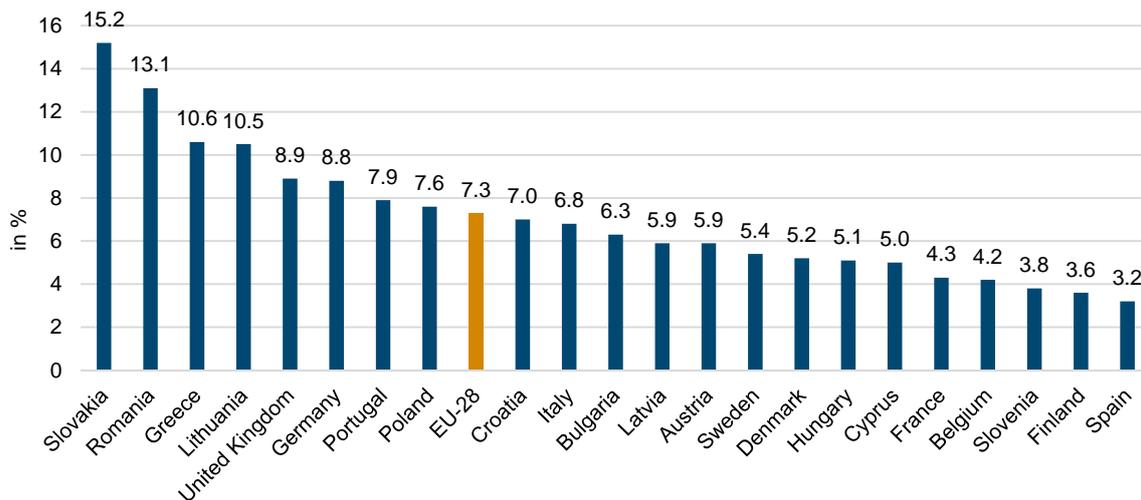
**Figure 79 / Development of the gross operating rate in the EU, wholesale of mining, construction and civil engineering machinery, 2008–2013, in %**



Source: Eurostat, Structural Business Statistics, own calculations.

When looking at differences between the EU Member States (Figure 80), it is apparent that countries such as Slovakia, Romania, Greece and Lithuania have the highest rates, due to lower labour costs, whereas Belgium, in spite of its relatively high turnover and value added, has a relatively low GOR. The high labour costs in Belgium – which consume a proportionately larger part of operating surplus – could explain this.

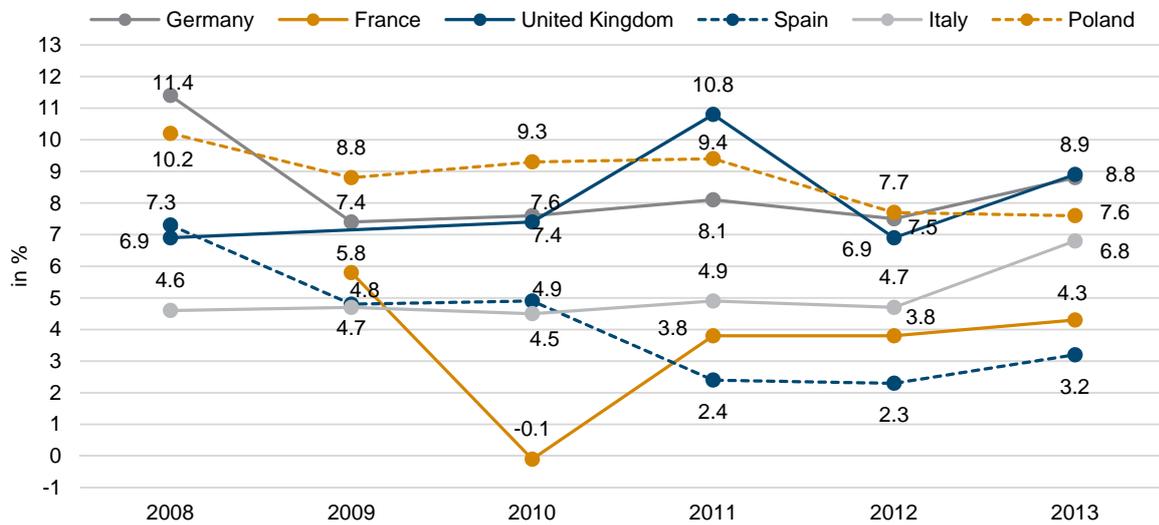
**Figure 80 / Gross operating rate in various EU countries, wholesale of mining, construction and civil engineering machinery, 2013**



Source: Eurostat, Structural Business Statistics, own calculations.

When we look at the more detailed evolution of gross operating rate in the six largest countries (Figure 81), we can observe that GOR increased only in the United Kingdom and Italy. Of the large EU Member States, Spain was once again hardest hit.

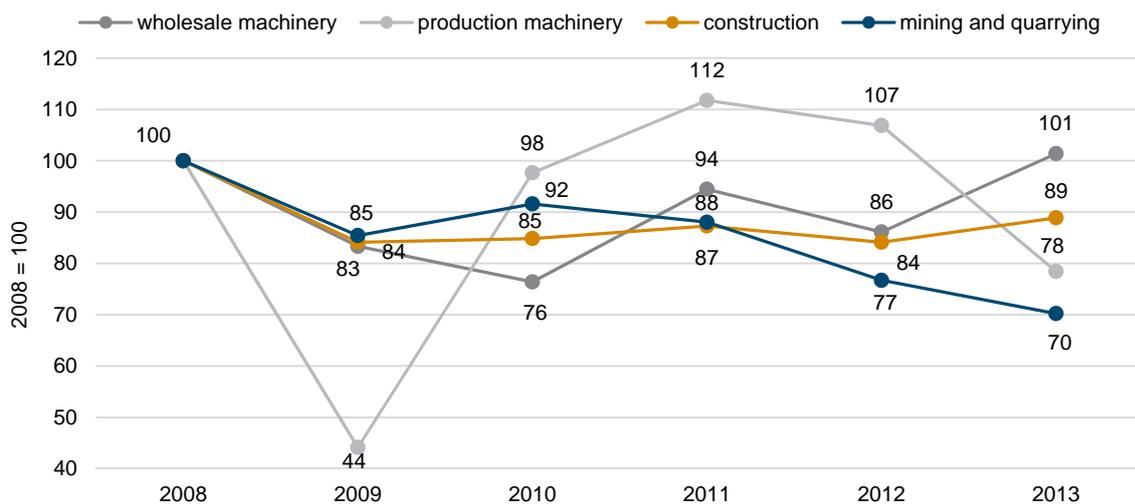
**Figure 81 / Evolution of the gross operating rate in the six largest EU Member States, 2008–2013, in %**



Source: Eurostat, Structural Business Statistics, own calculations.

The gross operating rate also paints a somewhat different picture from other indicators when we compare evolution within the sectors. The wholesale sector performs better than other sectors in the value chain in terms of surplus to turnover ratios, being the only sector that surpasses pre-2008 levels.

**Figure 82 / Evolution of the gross operating rate in the construction machinery value chain in the EU (2008 = 100)**



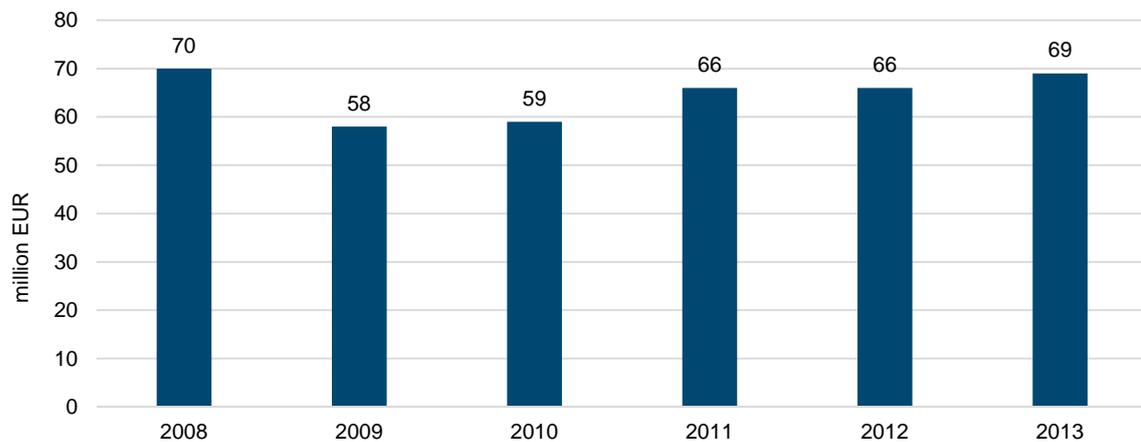
Source: Eurostat, Structural Business Statistics, own calculations.

### 9.2.5. Apparent labour productivity

Apparent labour productivity is defined as value added at factor cost divided by the number of persons employed. It provides an insight into the level of labour intensity required for a given level of economic output, and is therefore a proxy for the productivity of a sector.

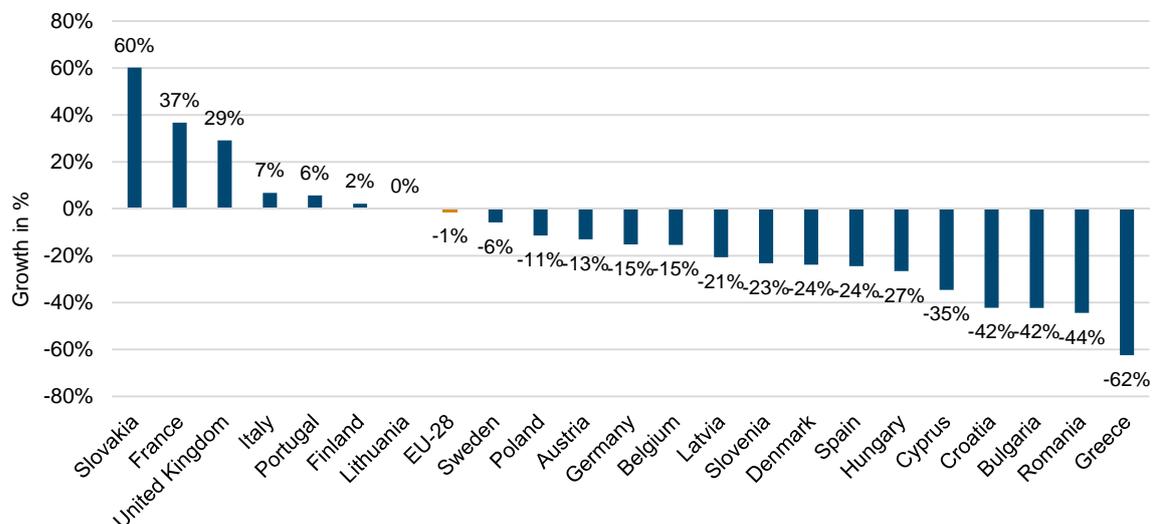
Overall labour productivity in the sector shows an upward trend from 2009 onwards, in spite of stagnating economic recovery and levels of economic output that are still below those in 2008; this indicates that wholesale of mining, construction and civil engineering machinery has produced more economic output with a smaller labour force.

**Figure 83 / Evolution of apparent labour productivity in EU-28, wholesale of mining, construction and civil engineering machinery, 2008–2013, in million EUR**



Source: Eurostat, Structural Business Statistics, own calculations.

**Figure 84 / Growth in apparent labour productivity in %, wholesale of mining, construction and civil engineering machinery, 2008–2013**

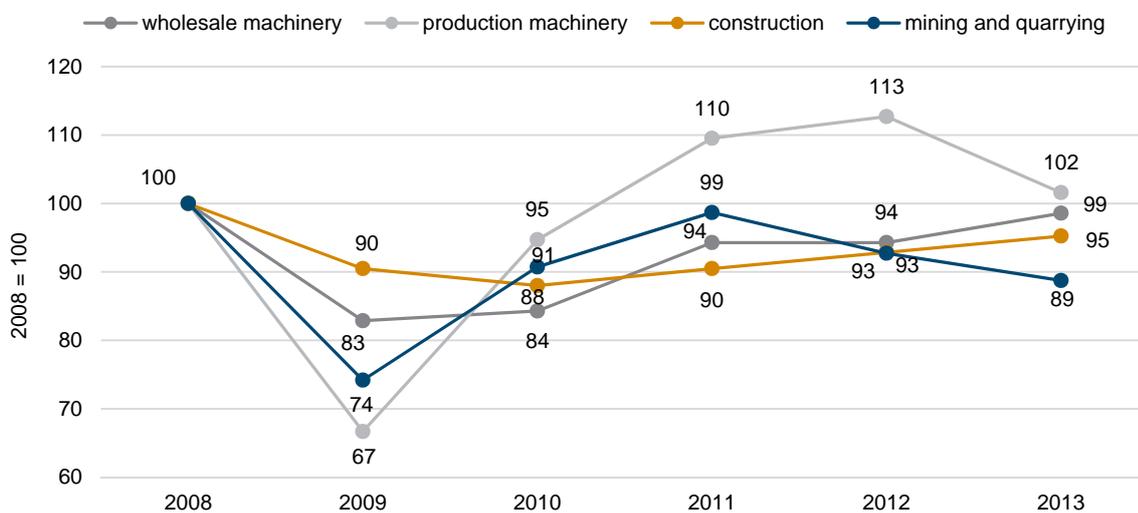


Source: Eurostat, Structural Business Statistics, own calculations.

This growth tendency in apparent labour productivity, however, again masks considerable differences between the EU Member States. Slovakia, France, the UK, Italy and Portugal show increases for the period 2008–2013, whereas firms in the other EU Member States did not manage to increase labour productivity. Germany, which performed well on many other indicators, has performed rather poorly here.

Compared to the production of machinery, wholesale productivity did not recover so rapidly after the crisis in 2008/2009, but it reached almost 99% of the 2008 level in 2013. To a large extent, the labour productivity of wholesale follows the curve of the construction industry.

**Figure 85 / Evolution of apparent labour productivity for different sectors of the construction machinery value chain, 2008–2013 (2008 = 100)**



Source: Eurostat, Structural Business Statistics, own calculations.

### 9.2.6. Price level of construction and mining equipment

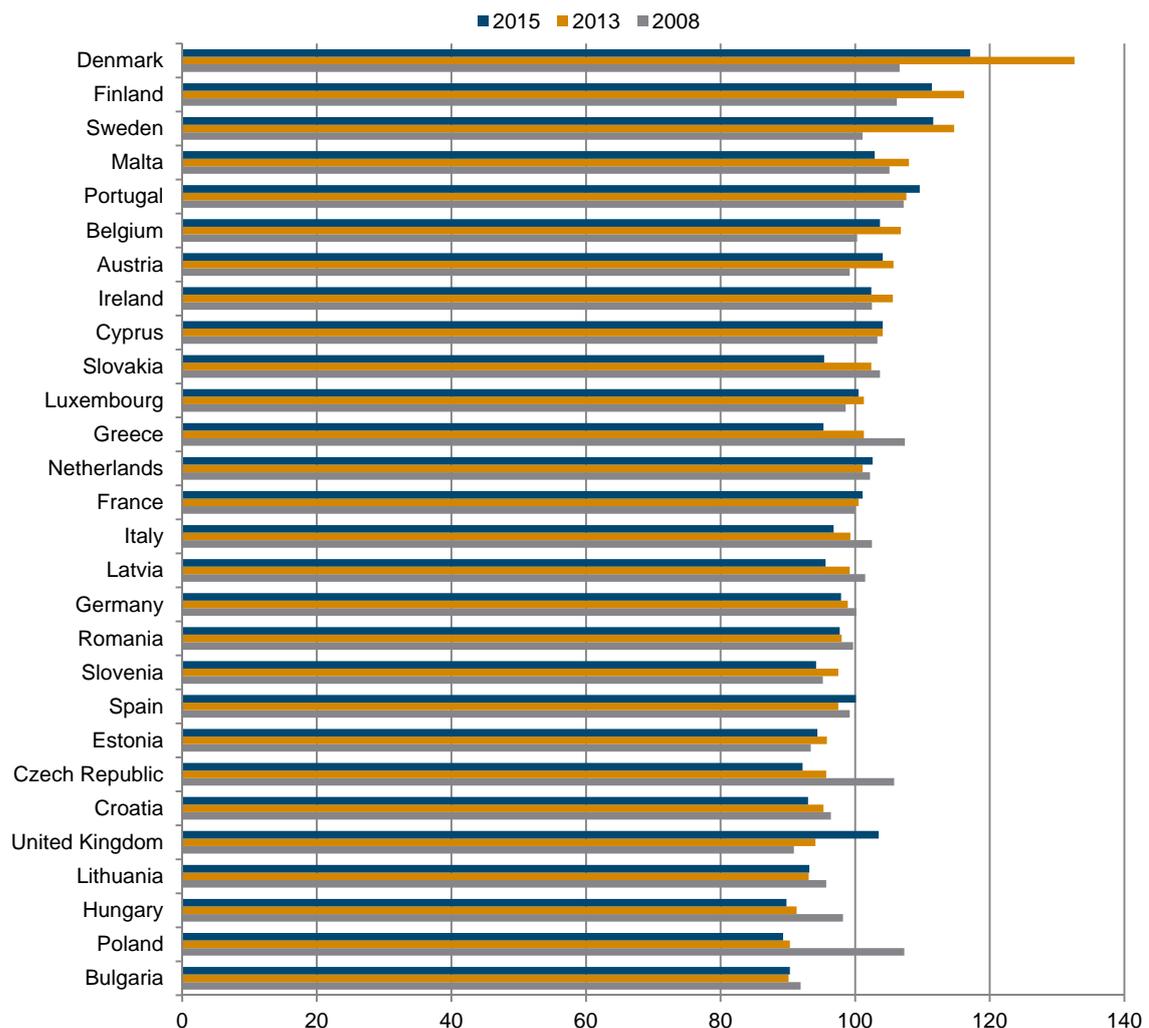
Generally, wholesale price levels in B2B relations are very difficult to find, and the construction and mining machinery sector is no exception to this. There are a few reasons why wholesale prices of construction machinery are difficult to find:

- › Prices in B2B relations are not public, but are usually negotiated between two economic operators and include discounts if the partners agree on a long-term relationship. Public price lists for construction machinery no longer exist (unlike the commercial vehicle industry, where price lists are publicly available).
- › As discussed before, machines are highly complex and are often tailor-made, with a number of options and applications; this makes it impossible to advertise the prices (also because of the sensitive nature of the negotiated price).

- › There is a trend toward pricing mechanisms that include service level agreements (SLAs) and service packages (presented as a solution); thus it is no longer just the machine itself that is priced. Depending on the level of the SLA, prices may be substantially different, which makes price comparison complex.

To gain some idea of the price level (and the evolution) of construction and mining machinery, we rely on the Eurostat price level statistics for investments in machinery and equipment. Construction and mining equipment is one of the product categories used in calculation of this price index, but the price index is not 'pure', since the prices of machine tools, food-process machines and textile and apparel production machines are also taken into account. Based on these figures, it seems that the standard deviation of prices across the EU-28 increased from 4.6 in 2008 to 8.8 in 2013 (indicating that price levels were spread over a wider range of values). In 2015, standard deviation decreased again to 6.9. It seems that prices are again converging.

**Figure 86 / Price level index for machinery and equipment in 2008, 2013 and 2015 in EU-28 countries (EU-28 = 100)**



Source: Eurostat, Purchasing Power Parities (PPPs).

In general, countries with high labour costs, like the Nordic countries and Belgium, also have higher price levels for machinery and equipment, while low labour cost countries have lower price levels for these investment goods. In many new EU Member States, prices dropped quite substantially after 2008 (for example in Poland, Czech Republic, Hungary).

In order to be able to explain the (evolution of) price level, a comparison has been made between the evolution of the price level, the evolution of the gross operating rate and the concentration index. Normally we may expect that higher competition will lead to decreasing prices and – all other things being equal – to decreasing gross operating rates. We may also expect that, in general, countries with a low C4 index (i.e. the market share of the four largest companies in terms of employment) and thus low market power of the largest companies, will have higher competition and thus lower price levels.

**Table 24 / Interrelationship between price level, gross operating rate and concentration index in the EU-28**

Countries ranked on 2013 price level (low to high)	Evolution price level 2013 vs 2008	Evolution gross operating rate 2013 vs 2008	C4 concentration index 2013 selected countries <sup>14</sup>
Bulgaria	-1.8	-1.7	46%
Poland	-17	-2.6	11%
Hungary	-6.9	-2.7	16%
Lithuania	-2.6	0.9	n.a.
United Kingdom	3.2	2.0	43%
Croatia	-1.1	-0.6	n.a.
Czech Republic	-10.1	n.a.	n.a.
Estonia	2.4	n.a.	n.a.
Spain	-1.7	-4.1	11%
Slovenia	2.3	1.0	n.a.
Romania	-1.7	-0.9	n.a.
Germany	-1.3	-2.6	18%
Latvia	-2.3	-5.5	n.a.
Italy	-3.2	2.2	22%
France	0.5	-1.5	28%
Netherlands	-1.1	n.a.	37%
Greece	-6.1	-6.4	n.a.
Luxembourg	2.7	n.a.	n.a.
Slovakia	-1.3	7.7	n.a.
Cyprus	0.8	-0.7	n.a.
Ireland	3.1	n.a.	n.a.
Austria	6.5	-2.3	45%
Belgium	6.5	-4.8	15%
Portugal	0.4	1.2	n.a.
Malta	2.9	n.a.	n.a.
Sweden	13.6	-1.4	21%
Finland	10	0.6	23%
Denmark	26	-0.4	15%
<b>Average</b>	<b>22.7</b>	<b>-1.0</b>	<b>25%</b>

Source: Eurostat SBS, Orbis.

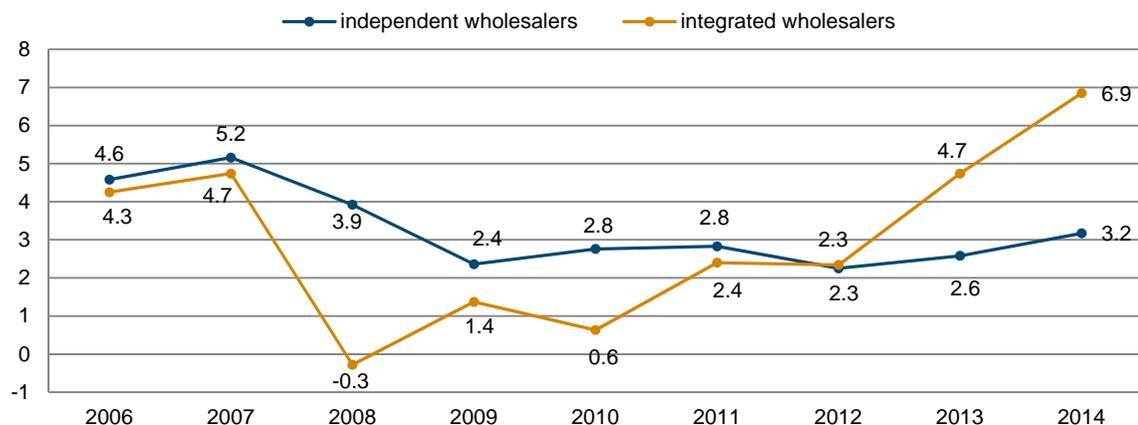
<sup>14</sup> Calculated as the sum of the employment of the four major companies in each country (as numerator) divided by the total employment in the same sector from the Eurostat SBS database.

In Table 24, we mark values in red that may indicate higher competition (because of the above reasoning). For quite a number of countries, we observe a correlation between the evolution of the price level and the gross operating rate. However, a correlation between price levels and the C4 concentration index is hard to observe, as there are countries that combine low price levels with very high concentration indices (like Bulgaria and the United Kingdom). At the other end of the spectrum, there are countries with high price levels combined with low concentration indices (like Belgium and Denmark).

### 9.2.7. Differences in profit margin between vertically integrated wholesalers and independent wholesalers

In Table 22 we already noticed a mix between independent wholesalers and wholesalers that are part of vertically integrated value chains. The latter type of wholesalers have the same owner as the manufacturing company. In order to check whether the performance of independent wholesalers is different from integrated wholesalers, each of the top 50 wholesalers in Europe was classified as one of the two types.

**Figure 87 / Evolution of profit margin (in %) between 2006 and 2014 of top 50 construction and mining machinery wholesalers, classified by typology of wholesaler**



Source: Orbis.

Based on Figure 87, integrated wholesalers suffered more from the economic and financial crisis – which is no surprise, as the share of sales in their turnover will be higher than in the case of independent wholesalers, which are relatively more involved in maintenance and repair. This pattern is very similar to the evolution of the value added of wholesalers and manufacturers of machinery discussed before. Integrated wholesalers are more cyclical, with more pronounced ups and downs because of a smaller buffer from maintenance and repair. Over the period 2006–2014, independent wholesalers had an average profit margin of 3.29%, compared to integrated wholesalers with an average profit margin of 3%. Integrated wholesalers, however, managed to increase their profit rate by 61%, while the profit margin of independent wholesalers dropped by 31% compared to 2006.

### 9.3. REGULATORY FRAMEWORK

The regulation of mining, construction and civil engineering machinery in the EU provides an excellent example of the tight linkages between wholesale and the upstream producing sectors. This regulation is very much sector specific and is of only minor importance for other parts of the wholesale sector, except NACE 46.63. Similar regulatory frameworks also exist for other parts of the wholesale sector, and are one important reason for the strong segmentation and heterogeneity of wholesale.

The wholesale of mining, construction and civil engineering machinery is regulated by a set of harmonised European Directives and national legislation. Both producers of machinery and wholesalers (if they are, for example, responsible for placing machines onto the European market for the first time) are impacted by this regulation. In theory, market surveillance ensures that products on the market are in conformity with the applicable law. But this compliance is only checked when machines imported from outside the European Union enter the European market. In practice, there are still shortages in market surveillance and, as a result, non-compliant machines are available on the European market; this may cause unfair competition between economic operators (after they have entered the European market). This is mainly an issue with second-hand machines that are traded via auction, but non-compliant new machines are also slipping through the net. In the past, new machines from non-European competitors or re-imported machines from European brands that were produced for the non-European market (with lower technological standards) have entered the European market. Market surveillance mechanisms could not prevent this.

Most regulations are harmonised at the European level, but not all: in particular, the road circulation requirements for non-road mobile machinery occasionally going on the road. This fragmented regulation is currently the major barrier to the single market in the sub-sector of this case study. This causes continuous barriers to the creation of a single market (not only when entering the market) because of costly testing procedures required for approval of the machines. Below we provide an overview of the legislation that most impacts the sub-sector.

#### 9.3.1. Machinery Directive 2006/42/EC

The Machinery Directive 2006/42/EC<sup>15</sup> has been in force since 29 December 2009. The legal basis of this Directive is provided by Article 114 of the Treaty on the Functioning of the European Union (TFEU), which enables the EU to adopt measures to harmonise the legislation of EU Member States in order to ensure the establishment and functioning of the internal market. The first Machinery Directive was adopted in 1989.

The Directive has the dual aim of harmonising the *health and safety requirements* applicable to machinery on the basis of a high level of protection of health and safety, while ensuring the *free circulation of machinery* on the EU market. The 2006 'New Approach' Directive promotes harmonisation through a combination of mandatory health and safety requirements and voluntary harmonised standards for products that are to be placed (or put into service) on the EU market for the first time. The Directive was amended in 2009, with specific provisions relating to machinery for pesticide application.

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<sup>15</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32006L0042>

The particular feature of this Directive is that it sets the basic requirements – or Essential Health and Safety Requirements (EHSR) – that are to apply to all manufacturers who wish to put their products on the European market. If a product meets the EHSR, then the product can be introduced onto the market. One way of demonstrating compliance with the EHSR is through compliance with harmonised European standards. Other solutions may allow a similar level of safety to be demonstrated.

The Machinery Directive is therefore part of the economic guidelines. It applies to products designed to be sold (or enabled) in the European Union for the first time. It is intended for manufacturers, importers and dealers in machinery and safety components, and applies to new machines. This Directive harmonises the level of safety of products designed and manufactured by different manufacturers. Machines already installed fall outside the scope of this Directive, because they are already on the market. Regarding the resale of used machines, national regulations describe the procedures to be followed.

The Machinery Directive applies to all new machinery placed on the market or put into service in the EU, whether such machinery is manufactured in the EU or outside the EU. In some EU Member States, the placing on the market of used or second-hand machinery is subject to specific national regulations. Otherwise the putting into service and use of second-hand machinery for professional use is subject to national regulations on the use of work equipment, implementing the provisions of Directive 2009/104/EC.

There is one exception to this general rule. The Machinery Directive applies to used or second-hand machinery that was first made available with a view to distribution or use outside the EU, when it is subsequently placed on the market or put into service for the first time in the EU. The person responsible for placing such used machinery on the market, or for putting it into service for the first time in the EU, must fulfil all the obligations set out in the Machinery Directive, whether he is the manufacturer of the machinery, an importer, a distributor or the user himself.

EU Member States will be responsible for verifying that the Directive's provisions are being applied. The manufacturer or the person placing the equipment on the market or putting it into service must ensure that he has drawn up a declaration of conformity certifying that each item of equipment is in conformity with the provisions of the Directive. Where a Member State ascertains that equipment does not comply with these conditions, it must withdraw it from the market or prohibit its use.

### **9.3.2. Outdoor Noise Reduction Directive 2000/14/EC**

The framework Directive 2000/14/EC<sup>16</sup> harmonised nine legal instruments on noise emissions for many types of equipment, as well as a Directive on lawnmowers. The aim is to improve the control of noise emissions by more than 50 types of equipment used outdoors, such as compressors, excavator-loaders, different types of saws, mixers, etc. The aim of the Directive is to promote the smooth functioning of the internal market and to improve the health and well-being of the population by reducing the noise emitted by equipment used outdoors.

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<sup>16</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02000L0014-20090420>

With a view to achieving this aim, it provides for four types of action:

- › harmonisation of noise emission standards;
- › harmonisation of conformity assessment procedures;
- › harmonisation of noise level marking;
- › gathering of data on noise emissions.

The following equipment is excluded:

- › non-powered attachments that are separately placed on the market or put into service (except for hand-held concrete-breakers and picks);
- › all equipment intended for the transport of goods or persons by public road or rail or by air or on waterways;
- › equipment designed and constructed for use by the police or the military.

The purpose of the Outdoor Noise Reduction Directive 2000/14/EC is thus to harmonise EU Member States' laws on noise emission limits, measurement methods and labelling requirements for 57 categories of construction equipment and other gear used outdoors. It removes technical barriers to trade and controls noise emissions into the environment. For 22 categories of equipment, Stage I noise limits began in 2002 and reduced limits for a Stage II began in 2006. An amending Directive, 2005/88/EC, allows Stage I limits to apply beyond 2006 for some categories of construction equipment.

EU Member States will be responsible for verifying that the Directive's provisions are being applied. The manufacturer or the person placing the equipment on the market or putting it into service must ensure that he has drawn up a declaration of conformity certifying that each item of equipment is in conformity with the provisions of the Directive and that he has affixed an indelible legible marking to each item of equipment indicating the guaranteed sound power level. Where a Member State ascertains that equipment does not comply with these conditions, it must withdraw it from the market or prohibit its use.

Alongside the Machinery Directive 2006/42/EC, this Directive addresses problems with noise emissions, with the Machinery Directive focusing largely on the occupational safety of the operator (among many other health and safety concerns and a much wider scope of products) and the Outdoor Noise Directive focusing on the overall environmental effects.

### **9.3.3. Emissions from Engines in Non-Road Mobile Machinery Directive 97/68/EC**

Directive 97/68/EC<sup>17</sup> regulates the emission of major air pollutants – NO<sub>x</sub>, HC, PM and CO – from diesel and petrol engines installed in non-road mobile machinery (NRMM). The environmental legislative framework for construction equipment is very complicated because of a patchwork of seven Directives (the 'mother' Directive 97/68/EC and six amendment Directives: 2002/88/EC,<sup>18</sup> 2004/26/EC,<sup>19</sup>

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<sup>17</sup> <http://eur-lex.europa.eu/legal-content/GA/TXT/?uri=celex:31997L0068>

<sup>18</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1464348511483&uri=CELEX:32002L0088>

<sup>19</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1464348665090&uri=CELEX:32004L0026>

2006/105/EC,<sup>20</sup> 2010/26/EU,<sup>21</sup> 2011/88/EU<sup>22</sup> and 2012/46/EU<sup>23</sup>). The Directive 97/68/EC sets out the maximum permitted exhaust emissions in relation to the power of the engine. Manufacturers must ensure that new engines comply with the limits set out in the Directive before placing their products on the market. The Commission adopted the 'Proposal for a Regulation on requirements relating to emission limits and type-approval for internal combustion engines for non-road mobile machinery'<sup>24</sup> on 25 September 2014. This was transferred to the European Parliament and Council, which amended and adopted the file on first reading (the Committee on Environment, Public Health and Food Safety – ENVI – approved the document in May 2016, and it is currently in the process of translation; the final vote is expected in July or September 2016).

The new legislation enters into force in 2019 and is intended to:

- › introduce Stage V in the EU rules, cutting emissions of major air pollutants from engines in non-road mobile machinery;
- › cut the complexity of the legal framework in this sector (moving from a Directive to a Regulation).

The new Regulation will replace a patchwork of 28 national laws. It will also repeal the current extremely complex Directive that contains 15 annexes and has been amended eight times since its adoption in 1997.

The revision of Directive 97/68/EC fits into a regulatory process that started in the early nineties and that has seen several revisions since. The most recent changes came into force in 2014, with the introduction of Stage IV, already reducing the mass of NO<sub>x</sub> and particulates from new engines by more than 95% compared to 15 years ago. The new Stage V will bring more equipment into scope (including the smallest and largest engines), reduce the mass of emissions further, and will additionally target the number of small particles emitted. This is expected to result in increased use of diesel particle filters (DPFs) on engine exhausts.

A new element introduced is the clause obliging the Commission to draw up, by the end of 2017, rules or guidance for retrofitting older machines with exhaust emissions reduction technology. This requirement will impact the second-hand market in particular, but in some cases will also affect new machinery.

There is a close connection between retrofitting policies and the increasing introduction of Low Emission Zones (LEZ) by cities and other local authorities throughout Europe. The LEZ development risks creating a parallel legal reality alongside the application of harmonised emission limits, as agreed in Directive 97/68/EC and the new Regulation (Stage V). This could impair the functioning of the internal market by imposing local requirements with regard to the applicable Stage of emissions legislation and/or by demanding retrofit measures. The combination envisaged, with financial incentives, risks further market distortion.

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<sup>20</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32006L0105>

<sup>21</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1464348810802&uri=CELEX:32010L0026>

<sup>22</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1464348868970&uri=CELEX:32011L0088>

<sup>23</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1464348919799&uri=CELEX:32012L0046>

<sup>24</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52014PC0581>

In recent years, environmental regulation, and in particular exhaust emissions requirements, has been a major driver in the design and cost of machines.

The EU exhaust emissions regulation for NRMM does not cover CO<sub>2</sub> emissions. Current EU legislation is setting CO<sub>2</sub> emission limits for passenger cars and light commercial vehicles. There is no such legislation in place for heavy-goods vehicles and NRMM, due to the heterogeneity of the products, and in particular of the 'work' they do. However, since fuel is one of the highest input costs when operating industrial products such as construction machines, CO<sub>2</sub> measurement and reduction is demanded by clients for simple cost reasons.

In order to reduce fuel consumption (and hence CO<sub>2</sub> emissions), manufacturers of construction and mining machinery have introduced (among others) the following changes to their machines and to the work environment of the machines:

- › *Machine efficiency*: e.g. intelligent load adaptation for compaction rollers, smart power management of drilling rigs
- › *Process efficiency*: e.g. cold recycling process for road repairs, optimising fleet utilisation
- › *Operation efficiency*: e.g. idling system and optimal choice of operating modes, training for machine operators
- › *Alternative energy sources*: e.g. hybridisation, electrification, use of natural gas

#### 9.3.4. RoHS Directive and WEEE Directive

Some equipment in the sector is also affected by EU environmental legislation restricting the use of hazardous substances in electrical and electronic equipment (RoHS Directive<sup>25</sup>) and by EU legislation promoting the collection and recycling of such equipment (WEEE Directive<sup>26</sup>), both in force since February 2003. Both Directives were revised recently. During the recast, the scope of both legal acts was considerably widened. In principle, all electrical and electronic equipment (EEE) will be in scope after a transitional period. However, construction equipment generally benefits from scope exclusions defined in both Directives. Excluded are: NRMM, large-scale stationary industrial tools (LSSIT), large-scale fixed installations and equipment specifically designed for these excluded products. However, NRMM without its own power source (e.g. cable powered) would fall within the scope of the Directive. This may lead to an unwanted effect of the legislation: machines with similar functionality, but different power sources – for example one model with a combustion engine, the other with a cable (because of safety concerns when working in mines, for example) are partly out of scope and partly in scope of the Regulation.

#### 9.3.5. Product safety and market surveillance package

The European Commission proposed a new package of legislative and non-legislative measures to improve consumer product safety and to strengthen market surveillance of products, including capital goods, in the EU on 13 February 2013. In particular, the latter part is important for manufacturers of industrial products such as machinery. The legislative proposals were amended and adopted by the

<sup>25</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32002L0095>

<sup>26</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32002L0096>

European Parliament but are still stuck in the Council, and an agreement is very unlikely. The disagreement concerns the application of the 'marking of origin' in the product safety part of the package.

Market surveillance is key for manufacturers to ensure consumer and user safety, environmental protection and fair competition in the single market (with a level playing field for all operators in the value chain). For investment goods like construction and mining machinery, which are highly specialised, market surveillance and controls are not at all simple, as they require a high level of technological expertise on the part of the controllers. Customs and enforcement of market surveillance are a national competence, and are applied differently throughout the EU. Often, there is a lack of knowledge and resources, and the control of machines is not seen as a priority, despite the economic cost and impact on user safety and the environment. Also the control of auctions of imported new and used material is problematic at the moment.

### **9.3.6. Road circulation requirements for non-road mobile machinery**

Legal requirements with respect to the road circulation for non-road mobile machinery are currently under the jurisdiction of the EU Member States and are not harmonised at the EU level. This causes a major obstacle to the single market; equipment, which for all other aspects is covered by harmonised EU legislation, may not be developed and produced in a single version to fulfil all national requirements. The multiplication of different requirements in the various EU Member States obliges manufacturers to produce different versions of the same machine model, in order to sell it across all Member States of the EU. Since much of the construction and mining machinery is already produced in small quantities, this lack of harmonisation creates a disproportionate burden for the sector. Therefore, the Association of Construction Machinery Producers is actively supporting the harmonisation of the road circulation requirements for non-road mobile machinery. Also wholesalers are impacted, as they have to adapt the machinery in order to sell or rent it within the EU.

### **9.3.7. New Legislative Framework (NLF)**

To improve the internal market for goods and strengthen the conditions for placing a wide range of products on the EU market, the New Legislative Framework (Decision 768/2008/EC<sup>27</sup>) was adopted in 2008. This is a package of measures that aim to improve market surveillance and boost the quality of conformity assessments. It also clarifies the use of CE marking and creates a toolbox of measures for use in product legislation. Currently mining, construction and civil engineering machinery legislation dates from before the New Legislative Framework came into force. All new legislation for the sector should take account of this New Legislative Framework (machinery safety, outdoor noise, etc.). It may have an influence on business models if new roles are given to manufacturers and dealers.

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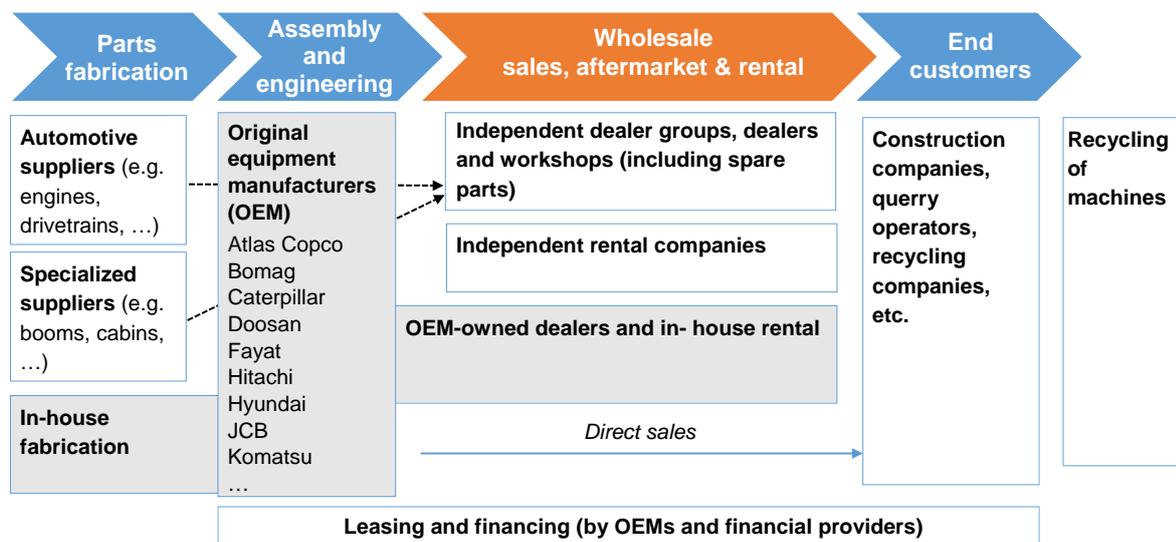
<sup>27</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1464349471092&uri=CELEX:32008D0768>

## 9.4. VALUE CHAIN

### 9.4.1. Description of the value chain

Wholesale of mining, construction and civil engineering machinery is part of a large, often global and complex value chain, which is summarised in the figure below. Using a recent study by McKinsey & Company (2016) on construction equipment, we describe this value chain in the following section.

**Figure 88 / Value chain of mining, construction and civil engineering machinery**



Source: Based on McKinsey & Company (2016).

At the beginning of the value chain are **suppliers of parts and components** – a role often played by the OEMs (in-house fabrication). In order to distinguish themselves from their competitors, OEMs tend to produce crucial components (like engines, cabs and frames) in house, or else the actual production is outsourced while engineering is done in house. Smaller niche OEMs tend to source more components externally, as they lack the scale to produce key components like engines in house. Even large OEMs source most of the parts externally (the less strategic ones) from a mix of small specialised construction equipment suppliers.

**OEMs** typically assemble the machines, although this can also be outsourced. It is not uncommon, especially with lower-volume machines, for one firm to assemble machines on its production line for another OEM. This type of cooperation is set up to secure production on a financially viable scale. In Europe there are a few multinational companies active in the production or assembly of machines, together with a fragmented landscape of small and medium-sized enterprises (SMEs). Caterpillar is the largest OEM, with an estimated market share of 33%. It has large production plants in the United Kingdom, Germany and Belgium. Number two on the European market is Komatsu (Japan), with production facilities in Germany, the United Kingdom and Italy. Other large OEMs listed in the overview above are more or less of similar size. Large OEMs often have a very diverse range of product types, in order to act as a one-stop shop for their clients. European OEMs have a very strong market position in drill rigs, cement pumps, road construction and rehabilitation, and in very specialist machines. Safety of

the machines is equally an important selling point of European machinery. Most companies are internationally highly active (mainly in North America, the Middle East and Asia), with exports being of relatively high importance in their turnover. European OEMs mainly compete on quality, not on price, as Asian companies (Chinese in particular) are price breakers.

**Distribution and services** (maintenance and spare parts) are equally fragmented, with differences across machine types and even within brands. For most of the higher-volume machines (earthmoving equipment, hoists, etc.) new or used equipment is *sold* to users through dealer networks, or is exported to upcoming industries (in case of used equipment). These dealers are partly owned by the OEM and are thus part of a vertically integrated value chain. There is no clear pattern, as the configuration of the dealer network depends on geography, type of machine, historical developments in dealer configuration, etc. However, partnership between dealers and OEMs is actually the buzz word in the value chain, as both parties are becoming more convinced that they have to work together in order to provide not only machines, but also solutions to the client. They both realise that they are links in a complex value chain, in which hardware loses its importance in favour of engineering and after-sales services.

OEMs typically work with several dealer groups in Europe, as they focus on certain geographies. It is possible that a dealer group focuses on only one particular region within a country, while others span several countries. Among the top 10 wholesalers, there are dealer groups for Caterpillar machines, like Zeppelin (cross-border activities in Germany, Austria, Czech Republic and Slovakia), Bergerat Monnoyeur (cross-border activities in France, Belgium, Luxembourg, Poland and Romania) and Pon (in the Netherlands, Denmark, Norway and Sweden). CGT from Italy, on the other hand, which is also among the top 10 companies, only serves the Italian market as Caterpillar dealer. This may not be a surprise, as the Italian market is one of the most fragmented in terms of machine production and wholesale. Also the density of dealers varies across dealer networks. For large fleet sales and specialised niche machine types (for example crushers, tunnel drills) the OEMs are often in direct contact with the end customer. In this case there is no direct need to invest in a dealer network.

Another important part of the revenue of dealers comes from the **repair and maintenance** of the machines and from the distribution of spare parts from the OEM or independent suppliers. However, OEMs often only guarantee the proper and safe functioning of their own material or spare parts. Given that mining and construction machinery is an investment good, with a life cycle of up to 25 years, it is clear that after-sales services are crucial, and are becoming even more important as more and more *solutions* are sold, rather than just machines (minimal downtime being the differentiating factor). For machines that are critical in the production process, it is not uncommon for service-level agreements to be reached, with interventions specified within two hours. Therefore, a dense network of dealers, close to where the machines are used, is necessary to honour the commitments. These aftermarket activities are an important profit generator, with earnings before interest and taxes (EBIT) margins that are many times those of new machinery sales. According to McKinsey, aftermarket makes up 15–20% of revenue.

Wholesale also generates income from the **rental of machines**. A large share of certain types of machines (mostly less specialised ones, like compact earthmoving, lifting and parts of heavy earthmoving equipment) is owned by dealers or specialised rental companies (NACE 77.32). In Western Europe, rental of construction equipment is well established, especially in the United Kingdom, France and the Nordic countries. Because construction companies are tending (after the financial crisis) to focus on their core activities, they are seeking to maximise machine utilisation and therefore they opt more

often for rental, instead of investing in machines. There are several larger regional rental companies (for example, Loxam, Ashtead, HSS Hire, Ramirent, Boels) and many local ones.

Finally, there are the **end customers**. Given the wide variety of machines in all different sizes and applications, it should come as no surprise that there is a wide variety of end users, like general contractors, quarry operators, recycling companies, etc. Many are SMEs (often micro-companies). It is possible that OEMs or wholesalers also operate the machines, in the event of occasional use by the end users or in case of specialised machines (pilling equipment and trenching machines).

Financing and renting of investment goods is becoming more and more important across the value chain, as companies try to offload their balance sheets – reduce debts by selling and leasing back assets. Most OEMs offer financing and renting solutions.

#### 9.4.2. Changes in the value chain

The value chain for the wholesale of mining, construction and civil engineering machinery is complex and heterogeneous; but the products in the value chain are also becoming **increasingly sophisticated**. Just as cars have evolved from a merely mechanical construction into a highly technological tool, so machinery is constantly adopting the latest innovations in data communication and electronics. These technological changes will drastically change the way in which machines are used. Driverless machines and 'big data' are just some of the more prominent changes that will impact the sector.

At the same time, the role of **emerging markets** is growing. An increasing number of construction activities in developing countries such as China, India, Brazil and Russia lead to an increased demand for construction machinery outside Europe. Key factors in this development are the growing demand for airports, dams, bridges, residential buildings, railways, metros and oil and gas pipelines (Marketsandmarkets.com 2014). The construction and mining sector in Europe and North America is also recovering from the economic downturn. These emerging markets not only lead to increased demand, but also to possible new suppliers. This could provide opportunities for wholesalers to engage with new manufacturers, while at the same time it could also lead to increased competition.

The increasing complexity and the growing importance of emerging markets have several **implications** for the position of wholesalers in the value chain. The first is the growing role of aftermarket services targeted at customers. Secondly, there could be further specialisation.

**Aftermarket services**, which account for 15–20% of revenue, already form an important aspect of the wholesale value chain. This is an attractive business for wholesalers, for several reasons. First of all, it is generally a high-margin business. Secondly, it can be used to compensate for economic downturns or the slower-growing European home market (McKinsey & Company 2016). Existing machines can generate income for wholesalers through the supply of spare parts, maintenance, repairs and general service, even when there is a slowdown in sales. Thirdly, this aftermarket service can be used as a competitive advantage in the face of the emerging markets. Non-European wholesalers already have a price advantage. While the quality of the products supplied by (most) non-European wholesalers and manufacturers is increasing, service could make the difference for possible clients. There is great demand for such services, given the often crucial role that specialised machinery has for customers.

More generally, there is also a shift in attitude from just selling products towards a more customer-centric perspective.

In order to deal with the increased competition and complexity, there is a possible trend towards further **specialisation** and niche products and services. End customers increasingly demand customised and specialised machines for specific applications (McKinsey & Company 2016). In order to provide the required services and knowledge, wholesalers must invest in better-trained and specialised personnel. The increased complexity also raises a concern that wholesalers could become more and more dependent on one manufacturer, since more manufacturers in the portfolio also raises the cost of providing a wide variety of complex machinery and related services. However, it is important to note that at the same time there is a trend towards providing a broad variety of services and products (similar to the producers), in order to offer clients a unique selling point. More and more wholesalers are adding rental, used machines, and even financial services to their portfolio.

Both the growing importance of aftermarket services and the increasing specialisation require a more **direct link with the customer**. Wholesalers increasingly serve as an important partner, linking manufacturers and end customers. They provide the manufacturer with feedback from the customer and provide the customer with expertise on the products of the manufacturer. To be effective, wholesalers have to be increasingly close to their customers. This direct link also has a geographical dimension. In order to ensure that a required service is available for the complex machines within the given time constraints, wholesalers often have to work nationally or even regionally. This direct link with the customer is not restricted to services, but increasingly includes communication through digital platforms and even social media.

The current and upcoming trends in wholesale of mining, construction and civil engineering machinery are closely intertwined. While these trends are recognised by experts and wholesale companies, they are not universally applicable to all wholesalers in the sector, because of the huge differences between products, companies and countries.

## 9.5. ASSESSMENT OF THE CREATION OF A SINGLE MARKET IN WHOLESALE OF CONSTRUCTION AND MINING MACHINERY

In the past, several barriers to the creation of a single market have been removed by the introduction of harmonised legislation on product safety, exhaust emissions, noise levels, etc. To a certain extent, these initiatives helped to create a level playing field for the different operators in the value chain. However, some barriers remain to the creation of a real single market. The most important are discussed below.

### › **Regulation on road circulation for non-road mobile machinery and remaining national or local regulation**

Legal requirements with respect to the road circulation for NRMM are currently not harmonised at the EU level, but remain within the jurisdiction of EU Member States. This causes a major obstacle to the internal market, since this has led to a situation whereby this kind of equipment – which in all other respects is covered by harmonised EU legislation – may not be developed and produced in a single version to fulfil those requirements. The many different requirements in the various EU Member States

oblige manufacturers to produce different versions of the same machine model, if they are to be able to sell it within the EU. Since much construction and mining machinery is already produced in small quantities, this lack of harmonisation creates a disproportionate burden for both manufacturers and wholesalers. Therefore, the Association of Construction Machinery Producers actively supports the harmonisation of the road circulation requirements for non-road mobile machinery. Wholesalers are also impacted, as they have to adapt the machinery, in order to sell or rent it within the EU.

Moreover, a lack of knowledge of national or local regulations that sometimes govern the operation or assembly of the machinery on site may hinder the cross-border activities of wholesalers, if they have to invest heavily in acquiring this knowledge or if cross-border activities are rare.

#### › **Lack of market surveillance**

Unsafe and non-compliant products are still able to enter the European market. This undermines the internal market and creates a disincentive for businesses to invest resources in ensuring that the design and manufacture of their products meet the various applicable regulatory requirements. The sale of non-compliant machinery on the EU market undermines the proper functioning of the EU market for the following reasons:

- The suppliers have not had to carry out the engineering and administrative tasks needed to comply, meaning that legitimate manufacturers and suppliers are undercut on cost.
- Non-compliant machinery is cheaper to produce, meaning that legitimate suppliers of compliant machinery are at a further disadvantage.
- Non-compliant machinery endangers the health and safety of workers and other citizens through a combination of failure to comply with the following:
  - engine emissions legislation, meaning that higher levels of pollutants are emitted than is allowed for new machines;
  - noise emissions, meaning an increased level of nuisance to workers and exposed persons;
  - safety: non-compliant machinery is frequently not manufactured to the same safety standards as machinery built in compliance with EU law, thereby endangering the safety of workers.

The Commission recognises that the rules are not respected and that enforcement is often not effective. Therefore, it has highlighted the need to streamline enforcement efforts in the single market and to step up controls on the external borders of the EU, through more coordinated, focused and determined action against non-compliant products (European Commission 2013). The Commission also aims at enhancing and simplifying rules for authorities and economic operators. The new legislation has so far not come into force. Because of the complexity of construction and mining machines, market surveillance will remain challenging and may remain a barrier to the creation of a single market.

#### › Introduction of Low Emission Zones

The introduction of Low Emission Zones by cities and other local authorities throughout Europe may create a parallel legal reality alongside the application of harmonised emission limits, as agreed in Directive 97/68/EC and the new Regulation (Stage V). This could impair the functioning of the internal market by imposing local requirements with regard to the applicable Stage of emissions legislation and/or by demanding retrofit measures.

#### › Local provision of after-sales services

Since downtime of machines can become extremely costly (because of huge penalty clauses in construction contracts in case of late delivery), there is a growing need for service teams that are able to intervene rapidly when machines break down. This may lead to a natural situation in which service providers and wholesalers mainly act in a geographically narrow area. Proximity and good knowledge of client needs are an essential asset, in order to provide the best possible solution to the client. This may – for non-mainstream machines – start early on in the process of buying a machine, when wholesaler and manufacturer sit down together to analyse the user's requests in order to come up with the best-suited machine, for which tailored engineering may be necessary. Throughout the life cycle, access to the accumulated knowledge about the machines will remain necessary in order to shorten intervention times in the case of failures, or to plan maintenance in the most cost-efficient way. Therefore, it is quite normal in the value chain for wholesale to be largely on a local scale.

#### › Language barriers and skills shortage

Wholesalers also mentioned language barriers as an obstacle to cross-border activities, due to the increased complexity of the machines. In case of machine failure, or if a machine is rented with an operator included, different languages may hinder the smooth execution of the building works.

## 9.6. SUMMARY

This section provided insights into the wholesale trade of mining, construction and civil engineering machinery in the EU and individual EU Member States, based on information from Eurostat (Structural Business Statistics), as well as evidence from interviews and reports on the construction and civil engineering machinery value chain. A major conclusion from the analysis is that this – at first sight – well-delimited sub-sector of wholesale trade is quite heterogeneous. That makes it very difficult to provide a clear picture of the sector, as the value chain and the role of wholesale may differ, depending on the type of machinery, its size, the size of the user market, etc. In that sense, this serves to confirm the conclusions reached in previous parts of the study. Moreover, this sub-sector is characterised by:

- › *Dense interrelations in the value chain:* since wholesalers are the only connection between manufacturer and final customer, they are an important part of the value chain. The importance of wholesalers is expected even to increase in the future, due to the increased cooperation between manufacturers and wholesalers. This cooperation is fuelled by a need to respond better to increasing customer requirements, in order to create value in the construction sector, which is under pressure and is becoming more complex. This may lead to vertical integration in the value chain. The upstream

players in the value chain often operate on a global scale (in particular broad-range manufacturers and manufacturers in niche markets), while the downstream players operate on a local or regional scale, due to the need for proximity to the client in case of machine failure.

- › *Better protection against economic cycles*: compared to the manufacturers of mining, construction and civil engineering machinery, wholesalers are less vulnerable to volatility because of the provision of maintenance and after-sales services. This diversification in their service portfolio provides a buffer against any immediate downturn in investment. However, the fact remains that competitiveness within the sector of wholesale of mining, construction and civil engineering machinery is largely driven by activity in the construction (and mining) industry. On the European scale, the economic performance of wholesalers has declined, with an impact that has been felt most keenly in the Southern European Member States. The competitiveness of wholesale activities is expected to increase because of the recovery of economic activity at final-customer level and because the after-sales market – traditionally the segment with the highest value added – *is expected to become more and more important*.
- › *Barriers to the creation of a single market remain*: the lack of harmonised regulation with respect to the road circulation of non-road mobile machinery remains a major barrier to the creation of a single market, especially in the upstream segments of the value chain. However, wholesalers are also impacted if they want to provide their services (mainly sales and rental of machinery) across borders. Also the lack of sufficient market surveillance when machines enter the European market causes major hindrances to the creation of a single market. Even with regulatory reforms implemented, this market surveillance will remain challenging, because of the complexity of the machinery. Also the trend towards the implementation of Low Emission Zones by cities and other local authorities throughout Europe is erecting barriers to the creation of a single market.

## 10. Summary of the findings, SWOT and policy conclusions

Wholesale employs about 10 million persons in the EU-28 and is one of the largest service sectors in the European economy. Employment in the sector recovered after the financial crisis and has **remained stable over the past five years**. Wholesale activities are quite evenly distributed across the EU, with a share of 7–9% of total employment in most EU Member States. Greece and Denmark, which are particularly specialised in wholesale, stand out.

The relatively equal distribution of wholesale across European countries and regions points to the **pervasiveness** of wholesale services, which are also confirmed by input-output analysis. Wholesale trade accounts for about 5% of total costs (as a percentage of gross output) and about 12% of total intermediate demand in manufacturing industries. In the five value chains analysed, we find the highest share of wholesale inputs in food and beverages, and the lowest in construction.

Despite the pervasiveness of wholesale, a closer look at indicators at the country level reveals a very diverse picture in the EU. There are considerable differences in terms of firm size, personnel costs, productivity and profitability across EU Member States. For example, firm size in the German, Danish and UK wholesale sector is double that found in Poland or the Netherlands, and treble the size found in the Czech Republic, Slovakia or Italy. Labour productivity of the wholesale sector in Luxembourg, Ireland and Belgium is five times larger than in Bulgaria, Romania or Slovakia.

Despite predictions of a decline in wholesale activity due to **disintermediation** and the diffusion of e-commerce, the input-output data indicate that the magnitude of wholesale inputs into the production processes is relatively stable over time. One reason for this stability is that wholesale firms are themselves moving into e-commerce. Moreover, wholesale firms also provide a range of services other than trade. One example of this is after-sales services, as highlighted in the case study on wholesale of construction machinery.

Wholesale trade can contribute to the integration of the **European single market** by bridging national markets and connecting producers, retail trade and industrial demand across Europe. Convergence in productivity and profitability between countries would be a sign that wholesale is on the way towards this goal, because the free flow of goods and capital would bring foreign competition into high-margin markets, would raise productivity and reduce extra-normal profits. However, the figures show virtually no convergence in productivity levels since 2000, and only a slow trend towards convergence in profitability.

This leads to the conclusion that considerable **barriers to the single market** still exist in wholesale services, in the form of territorial supply constraints and also national regulation – for example, for the labelling of goods. One of these barriers is the practice by manufacturing firms of preventing parallel imports. However, systematic evidence of this practice is lacking, apart from information for individual sectors (IDEA Consult et al. 2011; Prognos 2014). Another barrier is the difference in national regulation, which leads to higher costs for wholesales that are active in more than one European country.

There are also other indications of a **large degree of heterogeneity** in wholesale. 'Everything one says about wholesale is right and wrong at the same time, depending on what part of the sector you look at', as one interview partner maintained. An example is productivity: differences in labour productivity levels can be found at the 2-digit sub-sector and even at the 4-digit levels; the most productive NACE 4-digit sub-sector has three and a half times the productivity of the least productive sub-sector. We find similar degrees of heterogeneity across countries and sub-sectors in terms of firm size, value added by firm, and profitability.

One reason for this heterogeneity is that large parts of the wholesale sector are **very integrated along the value chain** with upstream manufacturers and downstream retailers. Obviously, a wholesaler in the clothing sector has much more in common with clothing manufacturers and retailers than with a wholesale firm trading in fruit. One of the factors that contribute to this heterogeneity is sector-specific regulation. Another reason for this heterogeneity is that different wholesale sub-sectors offer very different types of services. After-sales services – such as the rapid delivery of spare parts – are an essential task for the services provided by wholesale of construction machinery, yet have no role to play in food and beverages wholesale.

There is also heterogeneity in terms of **actors**. Three principal types of wholesale firms according to ownership can be distinguished: first, firms that are the wholesale divisions of domestic manufacturing, utilities or retail firms that are legally independent, but nevertheless embedded in the strategies and activities of their parent enterprise groups. Second, a considerable portion of the wholesale sector consists of affiliates of multinational manufacturing firms, which act as national representatives for the products of their parent companies. The share of these firms is around 15–30% of employment and even more of value added. Third, there are genuine wholesalers.

A good way of thinking about such a diverse sector is to focus on some very generic strengths and weaknesses, and to contrast these with the external opportunities and threats created by developments outside the wholesale sector. This short SWOT analysis leads to the following findings:

We see some **strengths** of wholesale, compared to other sectors of the economy, including:

- › Wholesale is a highly productive sector with a strong attitude towards investment and innovation. The sector is one of the leaders in e-commerce.
- › In recent years, employment has been more stable in wholesale than in manufacturing and construction.
- › The sector is closely connected to upstream and downstream industries and makes an essential contribution to the value chains of many other sectors.
- › Another strength is the strategy of many wholesale firms to develop new services around the needs of specific customer groups. A good example is after-sales services in the wholesale of machinery and equipment.
- › Foreign investment is important in wholesale and a driver of productivity growth.

The analysis also found some **weaknesses** in the wholesale sector, in particular:

- › Firms are very small in large parts of the wholesale sector, in particular in wholesale on a fee and contract basis; low firm size is related to lower productivity.
- › Parts of the wholesale sector are sensitive to changes in raw material prices, which explains in part the poor growth performance of wholesale since 2008.
- › A very slow convergence in productivity and, to a lesser degree, in profitability levels indicates that there has been only little progress towards European market integration in recent years. Evidence of territorial supply restrictions and obstacles to parallel imports in wholesale can be found in different sectors.

As external factors, we see some **opportunities** for the wholesale sector in the coming years:

- › The ongoing digitalisation in manufacturing (industrial internet, Industrie 4.0, etc.) may provide a tremendous opportunity for many wholesale firms, because one important part is the integration of various steps in the value chain, which is the core of many business models of wholesale firms.
- › Market opportunities may also open up for wholesale firms that proactively engage in e-commerce to benefit from the next steps in the technological evolution of these activities.
- › Finally, the trend towards 'big data' and artificial intelligence (machine learning) may provide a field for the development of highly automated, standardised services for wholesale firms. This may be the most promising field for technological innovation in the coming years for wholesale firms.

Finally, there are also some **threats** for wholesale in the future:

- › The development of technology in recent years has shown that there is a considerable risk of market disruption by new entrants from outside, which may also happen to some parts of the wholesale sector. Ironically, the opportunities that ICT provides for wholesale may turn into the opposite here, because the opportunities may also be used by firms outside the sector.
- › A related threat is disintermediation. Empirical evidence suggests that this threat has been exaggerated in the past; however, we cannot rule out the possibility that manufacturers and customers downstream in the value chain could make increased efforts towards vertical integration in coming years.

Based on our findings we present some **implications for policy**:

First, we believe that the statistical basis for policy has to be improved. In some statistics, there is no separation between wholesale and retail, which are two very different sectors. In input-output data, wholesale is lumped together with retail trade and transport.

We also see some need to improve the classification of wholesale in order to make it more consistent. While most parts are classified according to the main product traded, wholesale on a fee and contract

basis is classified according to the way in which business is conducted. Considering the blurring boundaries between wholesale and manufacturing in the form of distributive affiliates of multinational manufacturing firms, it may be even worth considering whether the distinction between manufacturing and wholesale should be abandoned altogether. In other fields, such as productivity, it would make sense to differentiate between independent wholesale firms and wholesale affiliates of enterprise groups. This could be done, for example, by distinguishing in the statistical data between wholesale firms that only sell the products of their own company group and wholesale firms that trade their own and third-party products.

Moreover, data on territorial supply constraints and restrictions on parallel imports would be welcome, in order to gain more insight into barriers to the single market. This could be done, for example, through a special, one-off extension to the surveys on trade data, where firms are asked not only about the goods they have exported or imported and their target country, but also about the sector where the goods came from, whether from an independent wholesaler or an affiliate of a multinational manufacturing firm.

Second, the heterogeneity of wholesale activities makes it difficult to imagine a policy for the whole wholesale sector. With respect to wholesale, we suggest that it would make more sense for policy to focus on sectoral value chains which include manufacturing, as well as wholesale activities, rather than to focus on the wholesale sector or sub-sectors. A good example of this idea is sector-specific regulation.

Another important topic for policies targeted at sectoral value chains is the removal of barriers to the internal market. The lack of convergence in productivity and profitability between EU Member States indicates that such barriers exist. In particular, policy should have an eye to barriers to parallel imports across borders within the single market. We found no data to indicate the size of these barriers in different sectors; however, we gleaned evidence from interviews and studies that they exist. Future research that focuses on these barriers would therefore be an important step towards the completion of the single market.

Moreover, the case study indicated that, despite large harmonisation efforts in recent years, there are still national regulations in place that impose costs on wholesale firms when they do business outside their home country. Again, this is a topic that is not only relevant for wholesale, but for whole sectoral value chains. We are also aware of the tensions between the benefits of trans-European regulation and the subsidiarity principle. Nevertheless, national regulation may still be a barrier in some policy areas.

With respect to e-commerce and innovation, we see wholesale already well positioned compared to other sectors of the economy, and do not think that further intervention is needed here. However, it may be worth thinking about measures to reduce the divide between Eastern European Member States and the rest of the European Union.

Finally, the report also highlights some **open questions** with respect to wholesale:

- › Is the current delimitation of wholesale as a sector useful, given its strong interrelation with transport and retail? Are other delimitations more useful, for example a classification that unites production and wholesale?

- › What determines the strategy of wholesale firms? What about the link between taxation and location in wholesale?
- › What determines organisational separation between wholesale and manufacturing activities in multinational firms?
- › What value added or turnover do wholesale firms create from different service activities, for example merchant trading, after-sales services, training, storage, e-commerce, headquarter functions, etc.?
- › What is the size and economic significance of territorial supply constraints and parallel imports in various sectors?

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## 12. Annex

**Table 25 / Calculation of value added**

<b>Sign</b>	<b>Category</b>
	turnover
+	capitalised production
+	other operating income
+/-	increases (+) or decreases (-) of stocks
-	purchases of goods and services (-)
-	other taxes on products which are linked to turnover but not deductible
-	duties and taxes linked to production
=	<b>Value added</b>

Eurostat 2016.

**Table 26 / Revenue and employees of the 10 largest companies in all NACE 3-digit sub-sectors of wholesale, EU-28, 2014 and 2013**

rank	Company name	Country	year	Revenue (billion USD)	Employees (thousand)
<b>NACE 46.1 Wholesale on a fee or contract basis</b>					
1	LOUIS DREYFUS COMMODITIES BV	NL	2014	64.72	19.19
2	SINOCHEM INTERNATIONAL OIL CO	UK	2014	47.44	0.02
3	SINERGY	FR	2014	11.15	n.a.
4	COOPERATIEVE INKOOPVERENIGING SUPERUNIE B.A	NL	2014	7.56	0.08
5	SCA PETROLE ET DERIVES	FR	2014	7.49	n.a.
6	BOOKER GROUP PLC	GB	2014	7.03	12.81
7	CARFUEL	FR	2014	6.84	n.a.
8	SOCIETE COOPERATIVE GROUPEMENTS D'ACHATS DES CENTRES LECLERC	FR	2014	5.86	n.a.
9	SYSTEME U CENTRALE REGIONALE OUEST DIMINUTIF SYSTEME U OUEST	FR	2014	5.49	n.a.
10	TRAVIS PERKINS TRADING COMPANY	UK	2014	3.43	7.85
<b>NACE 46.2 Wholesale of agricultural raw materials</b>					
1	NIDERA BV	NL	2014	18.31	3.82
2	GLENCORE GRAIN BV	NL	2014	16.15	0.27
3	LEVERANDORSELSKABET DANISH CROWN AMBA	DK	2014	9.81	23.76
4	UNION INVIVO	FR	2014	7.78	n.a.
5	TERRENA	FR	2014	5.75	n.a.
6	CEFETRA BV	NL	2014	5.57	0.25
7	VIVESCIA	FR	2014	5.49	n.a.
8	CARGILL FRANCE	FR	2014	4.86	n.a.
9	DANISH AGRO A.B.M.A	DK	2014	3.94	3.26
10	HAUPTGENOSSENSCHAFT NORD AG	DE	2014	3.25	1.80
<b>NACE 46.3 Wholesale of food, beverages and tobacco</b>					
1	ITM ALIMENTAIRE INTERNATIONAL	FR	2014	18.28	0.80
2	ICA GRUPPEN AB	SE	2014	13.44	22.68
3	COMPANIA DE DISTRIBUCION INTEGRAL LOGISTA SA	ES	2013	13.32	5.92
4	CARLSBERG BREWERIES A/S	DK	2013	12.30	40.34
5	KAUFLAND STIFTUNG & CO, KG	DE	2013	10.73	80.33
6	EDEKA HANDELSGESELLSCHAFT MINDEN-HANNOVER MBH	DE	2013	9.03	n.a.
7	ICA SVERIGE AB	SE	2014	8.66	5.42
8	EDEKA HANDELSGESELLSCHAFT SUEDWEST MBH	DE	2014	8.48	22.52
9	PHILIP MORRIS GMBH	DE	2014	8.44	0.50
10	BOOKER GROUP	UK	2014	7.03	12.81
<b>NACE 46.4 Wholesale of household goods</b>					
1	PHOENIX PHARMAHANDEL GMBH & CO	DE	2014	25.67	24.15
2	REXEL SA	FR	2014	15.90	29.59
3	H&M HENNES & MAURITZ GBC AB	SE	2014	14.64	2.68
4	OTRA NV	NL	2014	12.46	20.06
5	KESKO OYJ	FI	2014	11.88	23.79
6	CANON EUROPA NV	NL	2013	11.81	15.40
7	DECATHLON	FR	2013	10.35	n.a.
8	BOEHRINGER INGELHEIM INTERNATIONAL GMBH	DE	2013	10.11	0.16
9	DM DROGERIE MARKT	AT	2014	9.00	n.a.
10	ABBVIE LOGISTICS BV	NL	2013	7.99	0.06

ctd.

Table 26 / ctd.

rank	Company name	Country	year	Revenue (billion USD)	Employees (thousand)
<b>NACE 46.5 Wholesale of information and communication equipment</b>					
1	HEWLETT-PACKARD THE HAGUE BV	NL	2014	78.14	n.a.
2	CISCO SYSTEMS INTERNATIONAL BV	NL	2014	24.77	1.08
3	JMV GMBH & CO KG	DE	2014	7.18	44.08
4	HEWLETT-PACKARD CENTRE DE COMPETENCES FRANCE	FR	2014	6.66	1.94
5	GROUPE FNAC	FR	2014	4.73	14.48
6	FUJITSU TECHNOLOGY SOLUTIONS (HOLDING) BV	NL	2014	4.15	11.61
7	SAMSUNG ELECTRONICS (UK) LTD	UK	2014	4.08	1.44
8	ACER EUROPE BV	NL	2014	3.93	1.48
9	SAMSUNG ELECTRONICS FRANCE	FR	2014	3.83	0.57
10	HEWLETT-PACKARD FRANCE	FR	2014	3.45	n.a.
<b>NACE 46.6 Wholesale of other machinery, etc.</b>					
1	BAYWA AG	DE	2014	18.62	16.94
2	CRH NEDERLAND BV	NL	2014	9.72	33.45
3	SCHNEIDER ELECTRIC INDUSTRIES SAS	FR	2014	6.11	n.a.
4	AVNET EUROPE	BE	2014	5.18	0.16
5	SAMSUNG SEMICONDUCTOR EUROPE GMBH	AT	2014	4.87	n.a.
6	COSTA CROCIERE SPA	IT	2014	4.15	26.62
7	XEROX LTD	UK	2014	3.30	1.50
8	TETRA LAVAL BV	NL	2014	2.92	9.96
9	CFM INTERNATIONAL SA	FR	2014	1.89	n.a.
10	CNH INDUSTRIAL FRANCE	FR	2014	1.70	n.a.
<b>NACE 46.7 – Other specialised wholesale</b>					
1	E.ON GLOBAL COMMODITIES SE	DE	2014	133.87	1.04
2	TRAFIGURA BEHEER BV	NL	2014	127.61	5.33
3	SHELL TRADING INTERNATIONAL LTD	UK	2014	109.17	0.50
4	BP INTERNATIONAL LTD	UK	2014	85.91	n.a.
5	BP EUROPA SE	HU	2014	59.61	0.02
6	THYSSENKRUPP SLAB INTERNATIONAL BV	NL	2014	52.30	n.a.
7	ENI TRADING & SHIPPING SPA	IT	2014	51.91	0.32
8	TOTAL MARKETING SERVICES	FR	2014	29.26	3.55
9	SHELL TRADING ROTTERDAM BV	NL	2014	27.80	0.14
10	ENEL TRADE SPA	IT	2014	27.05	0.34
<b>NACE 46.9 – Non-specialised wholesale trade</b>					
1	RWE SUPPLY & TRADING GMBH	DE	2014	14.43	1.23
2	SOC D'IMPORTATION LECLERC	FR	2014	12.61	n.a.
3	NOBLE CLEAN FUELS LTD	UK	2014	12.27	0.04
4	KESKO OYJ	FI	2014	11.88	23.79
5	SUOMEN OSUUSKAUPOJEN KESKUSKUNTA	FI	2014	8.89	9.17
6	PALMER & HARVEY (HOLDINGS) PLC	UK	2014	6.61	4.33
7	PALMER & HARVEY MCLANE LTD	UK	2014	6.56	3.42
8	BOOKER LIMITED	UK	2014	5.76	9.71
9	METRO CASH & CARRY FRANCE	FR	2014	5.45	9.21
10	RUOKAKESKO	FI	2014	5.08	0.60

**Table 27 / Main indicators – Wholesale trade, except motor vehicles and motorcycles (NACE 46), 2013**

	BE	BG	CZ	DK	DE	EE	IE	EL	ES	FR
Enterprises	40	27	86	15	148	7	10	67	199	168
Persons employed	227	156	273	187	1,835	30	89	275	994	1,057
Firm size (pers. employed)	5.7	5.9	3.2	12.2	12.4	4.5	8.8	4.1	5.0	6.3
Firm size (value added)	518,177	90,415	81,741	902,475	852,630	138,114	871,416	119,874	221,217	468,846
Turnover	248,149	34,990	86,238	101,166	1,154,055	13,762	62,124	62,452	360,571	825,127
Production value	58,765	5,503	17,662	27,568	222,247	2,183	18,952	18,381	84,366	51,389
Purch. of goods and services	224,604	32,690	80,546	88,451	1,041,324	12,870	53,418	55,051	320,829	719,294
Value added	20,740	2,398	6,995	13,855	126,081	927	8,777	8,005	44,072	78,591
Personnel costs	12,651	921	3,732	9,256	76,504	475	4,162	4,667	28,711	56,699
Average personnel cost	56	6	14	49	42	16	47	17	29	54
Gross operating surplus	8,088	1,477	3,263	4,599	47,342	453	4,615	3,339	15,361	21,892
Gross investment	5,333	1,025	2,296	1,708	17,441	320	901	973	7,707	6,597
Gross value added per person employed	91	15	26	74	69	31	98	29	44	74
Wage adj. labour productivity	137	231	146	145	155	178	193	131	132	132
Gross operating surplus/turnover	3.3	4.2	3.8	4.5	4.1	3.3	7.4	5.3	4.3	2.7
Investment/value added	13	21	16	6	7	17	8	6	9	8

	HR	IT	CY	LV	LT	LU	HU	MT	NL	AT
Enterprises	16	398	4	9	9	4	33	2	87	25
Persons employed	76	1,151	20	43	74	17	169	11	506	204
Firm size (pers. employed)	4.6	2.9	5.0	5.0	8.0	4.6	5.1	5.0	5.8	8.2
Firm size (value added)	96,629	144,741	177,190	129,898	194,441	829,188	130,903	168,928	527,119	611,180
Turnover	14,136	557,197	5,093	17,048	18,035	67,676	44,398	3,672	438,217	150,439
Production value	3,550	149,383	1,075	2,835	3,523	6,081	9,711	677	99,893	33,276
Purch. of goods and services	12,993	495,305	4,342	16,037	16,364	64,406	40,090	3,355	390,908	131,986
Value added	1,585	57,659	690	1,117	1,801	3,054	4,331	356	45,617	15,099
Personnel costs	925	29,458	472	446	779	946	2,181	169	23,734	9,478
Average personnel cost	12	26	24	10	11	56	13	16	47	47
Gross operating surplus	655	28,202	218	671	1,022	2,108	2,150	187	21,883	5,620
Gross investment	225	10,890	107	166	569	371	1,187	32	4,873	2,232
Gross value added per person employed	21	50	35	26	24	180	26	34	90	74
Wage adj. labour productivity	159	121	145	249	229	314	183	186	176	143
Gross operating surplus/turnover	4.6	5.1	4.3	3.9	5.7	3.1	4.8	5.1	5.0	3.7
Investment/value added	7	9	8	15	16	6	14	9	5	7

	PL	PT	RO	SI	SK	FI	SE	UK	NO	CH
Enterprises	114	60	52	14	48	15	46	104	17	11
Persons employed	688	222	322	45	129	91	247	1,182	106	207
Firm size (pers. employed)	6.0	3.7	6.2	3.3	2.7	6.0	5.3	11.4	6.2	18.5
Firm size (value added)	143,174	109,292	96,873	106,888	54,352	437,742	445,831	531,517	700,489	4,347,772
Turnover	197,143	61,399	54,438	12,686	26,852	69,842	155,580	1,148,013	101,740	1,305,343
Production value	80,027	14,847	14,425	3,393	6,366	14,191	38,470	179,487	30,389	100,051
Purch. of goods and services	177,671	55,454	49,380	11,192	24,189	64,621	135,387	1,061,989	86,548	1,265,317
Value added	16,338	6,563	5,003	1,460	2,608	6,630	20,690	55,195	11,901	48,682
Personnel costs	7,328	4,112	2,116	907	1,424	4,259	14,217	43,143	8,049	20,510
Average personnel cost	11	18	7	20	11	47	58	36	76	99
Gross operating surplus	9,009	2,451	2,887	553	1,222	3,177	6,473	12,053	3,852	28,172
Gross investment	4,648	1,521	2,428	237	815	860	2,789	10,922	1,589	4,658
Gross value added per person employed	24	30	16	32	20	73	84	47	112	235
Wage adj. labour productivity	179	137	226	135	129	144	126	124	144	:
Gross operating surplus/turnover	4.6	4.0	5.3	4.4	4.6	4.5	4.2	1.0	3.8	2.2
Investment/value added	14.7	12	24.3	8.1	18.8	6.5	6.9	9.9	6.7	4.8

Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations

Notes: Ireland, values of 2012; unless otherwise stated, values refer to million EUR; number of enterprises and number of persons employed are given in thousands; average personnel costs (personnel costs divided by number of persons employed) and apparent labour productivity are given in EUR thousand per person; wage adjusted labour productivity, gross operating rate and investment rate are ratios expressed as percentages; gross investment includes gross investment in tangible goods, land, existing buildings and structures, investment construction and alteration of buildings and in machinery and equipment.

**Table 28 / Structural profile for wholesale trade at NACE 3-digit and 4-digit level, EU-28, 2013**

NACE	Sector	Number of firms	Persons employed	Value added, million EUR
46.1	<b>Wholesale on a fee or contract basis</b>	<b>583,523</b>	<b>1,017,600</b>	<b>44,001</b>
46.11	Agents involved in the sale of agricultural raw materials, live animals, textile raw materials and semi-finished goods	18,444	34,400	1,649
46.12	Agents involved in the sale of fuels, ores, metals and chemicals	23,053	49,400	3,451
46.13	Agents involved in the sale of timber and building materials	36,506	62,500	2,224
46.14	Agents involved in the sale of machinery, industrial equipment, ships and aircraft	40,197	100,400	7,158
46.15	Agents involved in the sale of furniture, household goods, hardware	42,184	69,500	2,829
46.16	Agents involved in the sale of textiles, clothing, fur, footwear and leather goods	48,185	87,400	3,482
46.17	Agents involved in the sale of food, beverages and tobacco	63,440	127,100	6,156
46.18	Agents specialised in the sale of other particular products	137,459	224,300	9,441
46.19	Agents involved in the sale of a variety of goods	174,055	262,500	7,611
46.2	<b>Wholesale of agricultural raw materials and live animals</b>	<b>64,973</b>	<b>341,600</b>	<b>17,000</b>
46.21	Wholesale of grain, unmanufactured tobacco, seeds and animal feeds	30,085	202,000	11,193
46.22	Wholesale of flowers and plants	14,314	78,500	3,087
46.23	Wholesale of live animals	16,587	48,000	2,052
46.24	Wholesale of hides, skins and leather	3,986	13,100	:
46.3	<b>Wholesale of food, beverages and tobacco</b>	<b>211,023</b>	<b>1,786,100</b>	<b>85,236</b>
46.31	Wholesale of fruit and vegetables	43,299	396,000	15,366
46.32	Wholesale of meat and meat products	23,273	166,100	6,763
46.33	Wholesale of dairy products, eggs and edible oils and fats	14,852	110,500	6,539
46.34	Wholesale of beverages	40,852	243,400	12,967
46.35	Wholesale of tobacco products	2,518	47,300	4,890
46.36	Wholesale of sugar and chocolate and sugar confectionery	11,401	85,500	5,199
46.37	Wholesale of coffee, tea, cocoa and spices	7,308	40,200	1,852
46.38	Wholesale of other food, including fish, crustaceans and molluscs	39,243	264,600	13,368
46.39	Non-specialised wholesale of food, beverages and tobacco	28,276	432,400	18,293
46.4	<b>Wholesale of household goods</b>	<b>315,566</b>	<b>2,341,000</b>	<b>152,502</b>
46.41	Wholesale of textiles	22,225	108,800	4,549
46.42	Wholesale of clothing and footwear	61,021	365,700	22,992
46.43	Wholesale of electrical household appliances	28,772	243,500	16,065
46.44	Wholesale of china and glassware and cleaning materials	16,516	98,800	4,981
46.45	Wholesale of perfume and cosmetics	21,471	194,800	12,924.5
46.46	Wholesale of pharmaceutical goods	39,788	617,000	52,352.5
46.47	Wholesale of furniture, carpets and lighting equipment	24,606	134,200	6,260.9
46.48	Wholesale of watches and jewellery	13,709	56,500	2,597.2
46.49	Wholesale of other household goods	87,462	521,600	29,780.1
46.5	<b>Wholesale of information and communication equipment</b>	<b>61,256</b>	<b>585,500</b>	<b>49,000.0</b>
46.51	Wholesale of computers, computer peripheral equipment and software	37,212	359,500	31,370.0
46.52	Wholesale of electronic and telecommunications equipment and parts	24,044	225,900	:
46.6	<b>Wholesale of other machinery, equipment and supplies</b>	<b>170,648</b>	<b>1,335,200</b>	<b>84,660.3</b>
46.61	Wholesale of agricultural machinery, equipment and supplies	23,468	182,300	10,040.0
46.62	Wholesale of machine tools	13,782	81,900	5,052.9
46.63	Wholesale of mining, construction and civil engineering machinery	11,226	88,200	6,064.9
46.64	W. of machinery for the textile industry and of sewing and knitting machines	2,400	9,200	462.3
46.65	Wholesale of office furniture	6,000	32,300	1,657.4
46.66	Wholesale of other office machinery and equipment	10,584	94,300	5,141.7
46.69	Wholesale of other machinery and equipment	103,095	847,000	56,241.1
46.7	<b>Other specialised wholesale</b>	<b>276,890</b>	<b>2,247,600</b>	<b>98,685.2</b>
46.71	Wholesale of solid, liquid and gaseous fuels and related products	21,902	198,700	-2,981.9
46.72	Wholesale of metals and metal ores	21,034	226,100	13,580.5
46.73	Wholesale of wood, construction materials and sanitary equipment	113,312	865,700	35,558.7
46.74	Wholesale of hardware, plumbing and heating equipment and supplies	46,350	502,500	25,080.2
46.75	Wholesale of chemical products	27,479	210,200	16,576.0
46.76	Wholesale of other intermediate products	17,700	101,500	5,670.9
46.77	Wholesale of waste and scrap	29,114	142,900	5,200.9
46.9	<b>Non-specialised wholesale trade</b>	<b>121,357</b>	<b>665,700</b>	<b>25,771.4</b>

Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

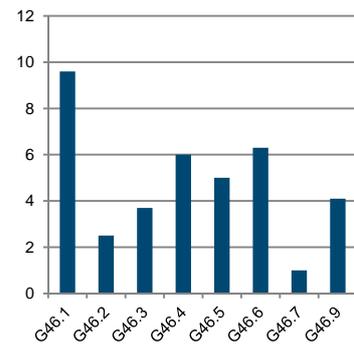
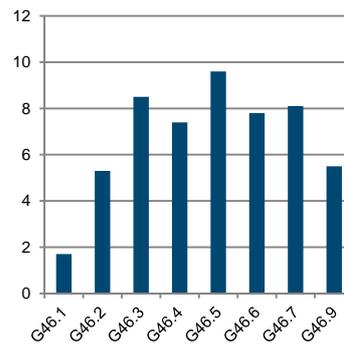
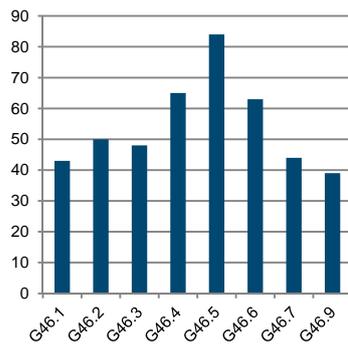
**Figure 89 / Apparent labour productivity, number of persons employed per enterprise and profitability (gross operating rate in % of turnover), wholesale NACE 3-digit level, EU Member States, 2013**

Value added per person employed  
(in 1,000 EUR p.p.)

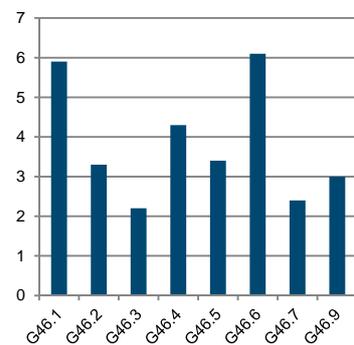
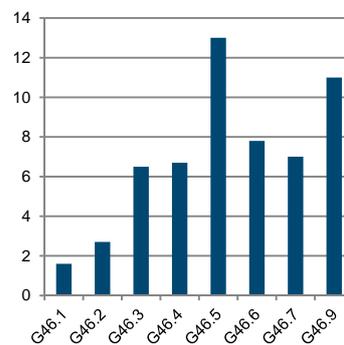
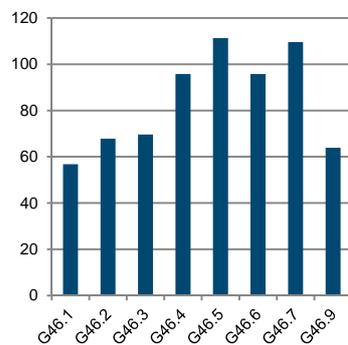
No. of persons employed per  
enterprise (in 1,000)

Gross operating rate (in %)

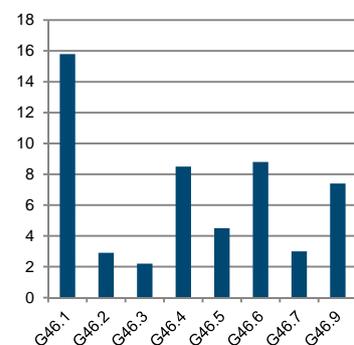
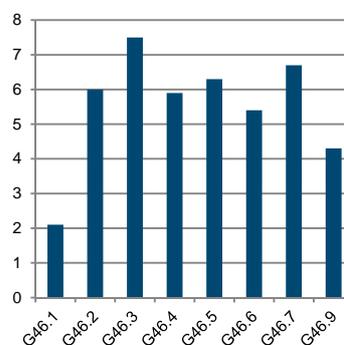
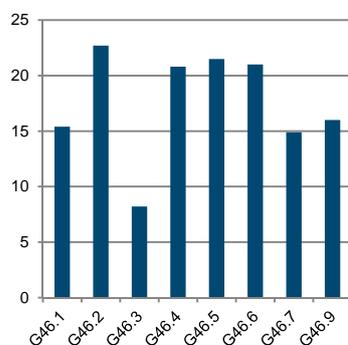
### EU 28



### Belgium



### Bulgaria



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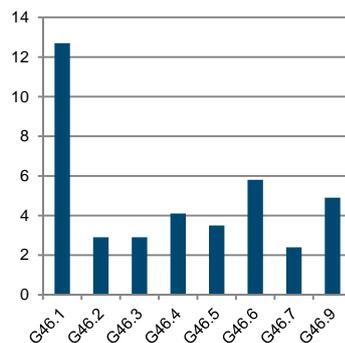
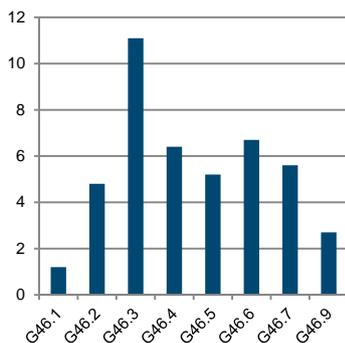
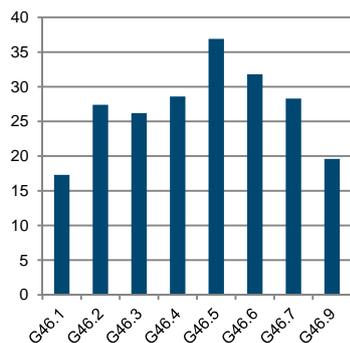
**Figure 89 / ctd.**

Value added per person employed  
(in 1,000 EUR p.p.)

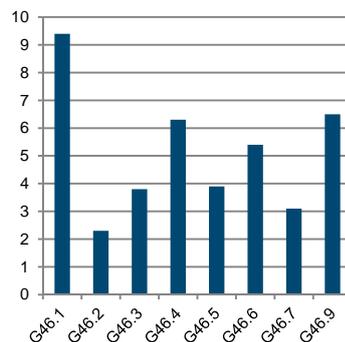
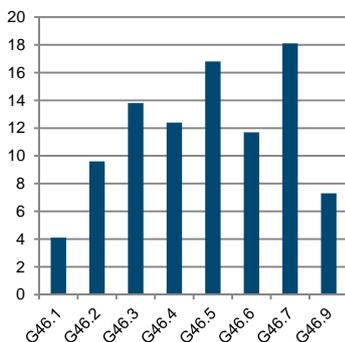
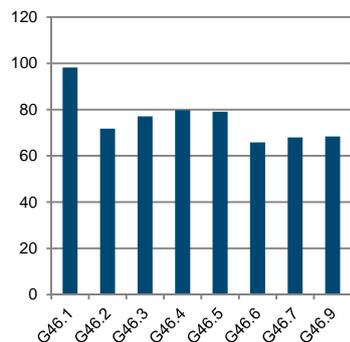
No. of persons employed per  
enterprise (in 1,000)

Gross operating rate (in %)

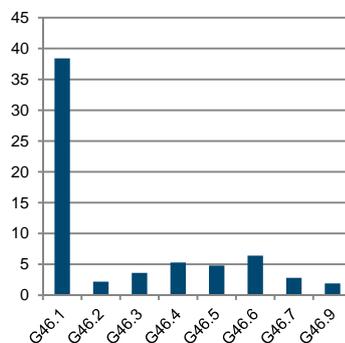
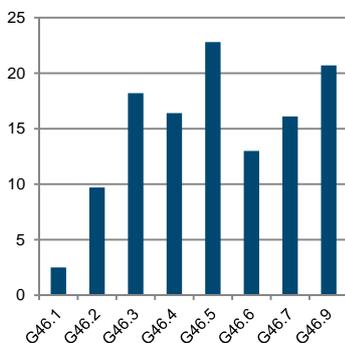
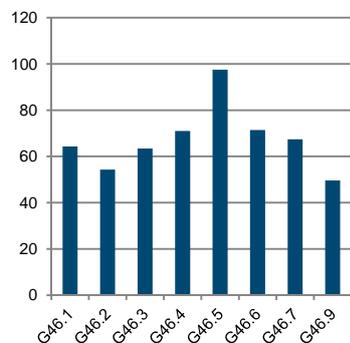
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**Denmark**



**Germany**



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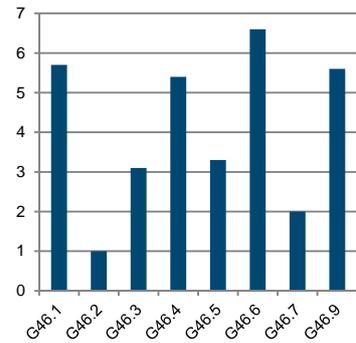
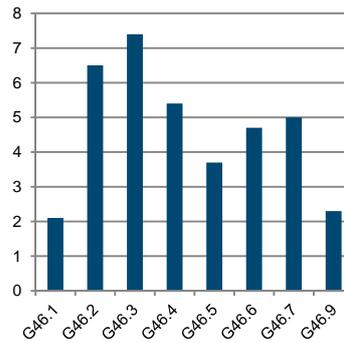
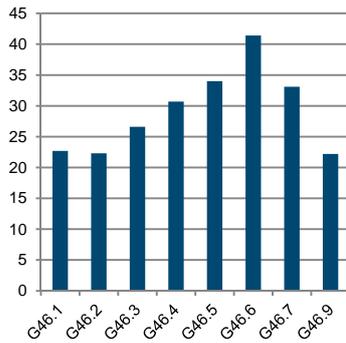
**Figure 89 / ctd.**

Value added per person employed  
(in 1,000 EUR p.p.)

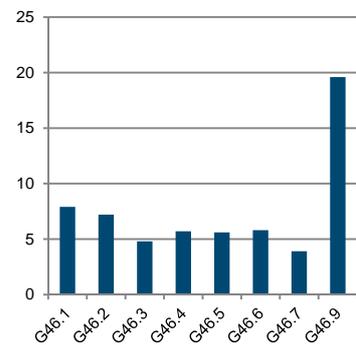
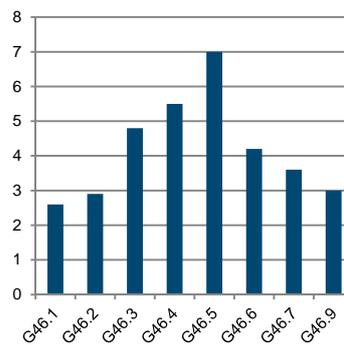
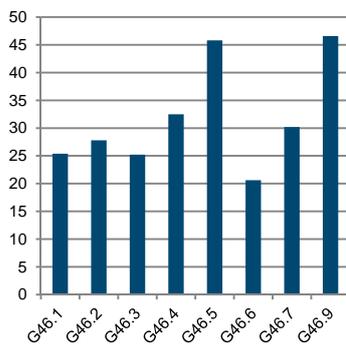
No. of persons employed per  
enterprise (in 1,000)

Gross operating rate (in %)

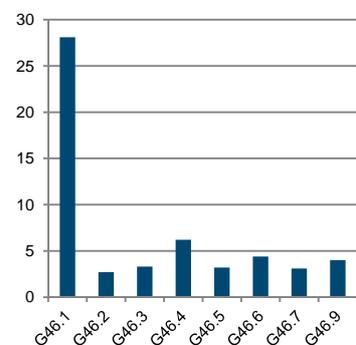
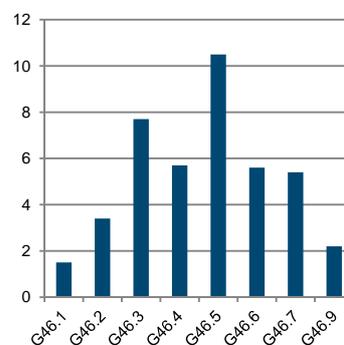
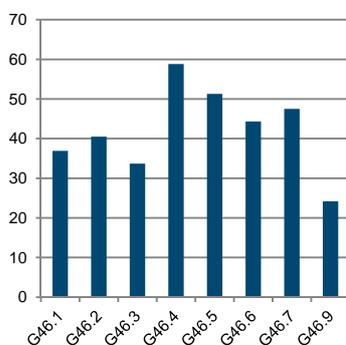
### Estonia



### Greece



### Spain



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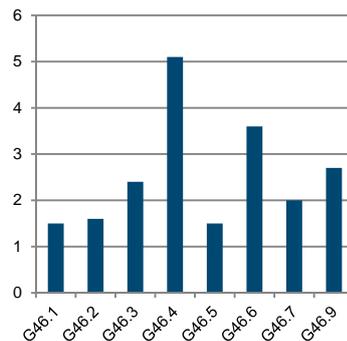
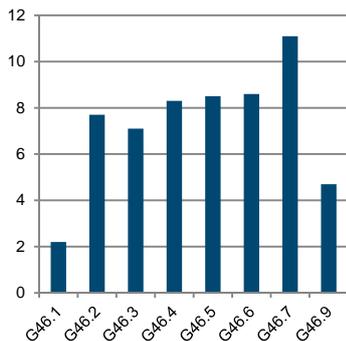
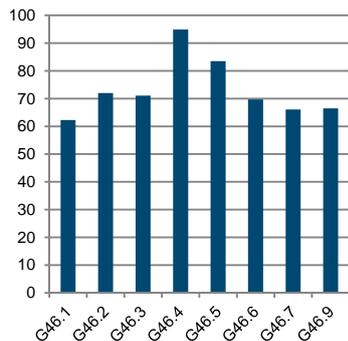
**Figure 89 / ctd.**

Value added per person employed  
(in 1,000 EUR p.p.)

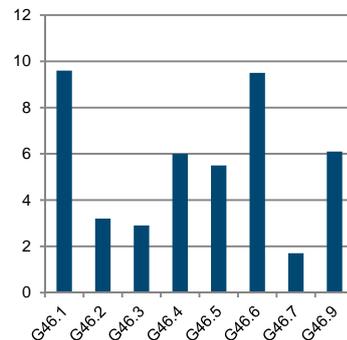
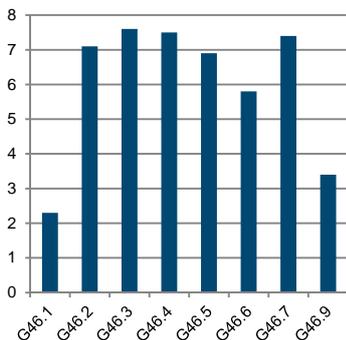
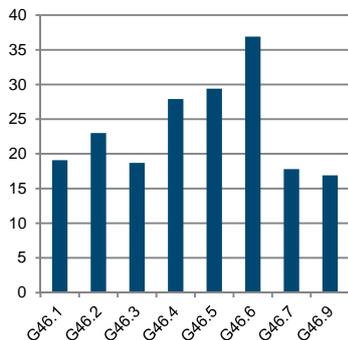
No. of persons employed per  
enterprise (in 1,000)

Gross operating rate (in %)

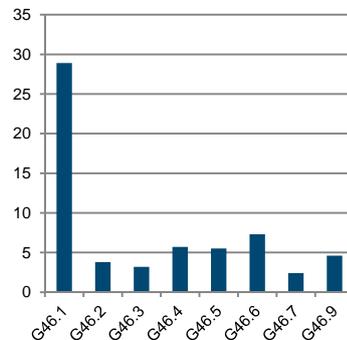
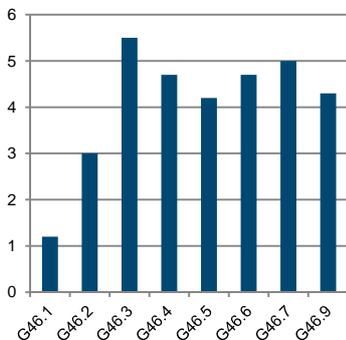
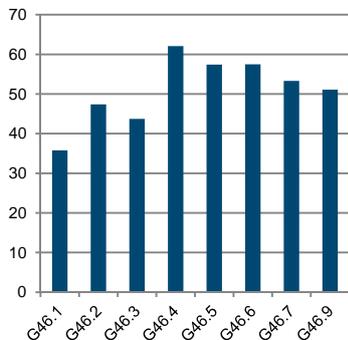
**France**



**Croatia**



**Italy**



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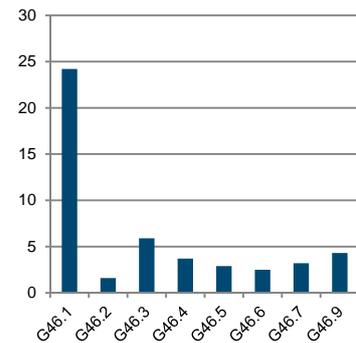
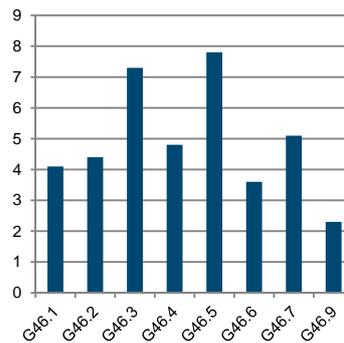
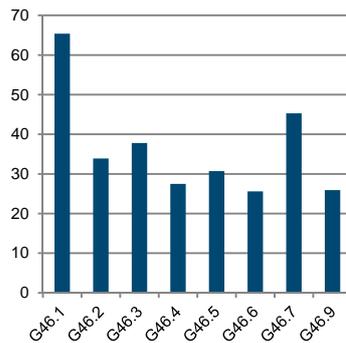
**Figure 89 / ctd.**

Value added per person employed  
(in 1,000 EUR p.p.)

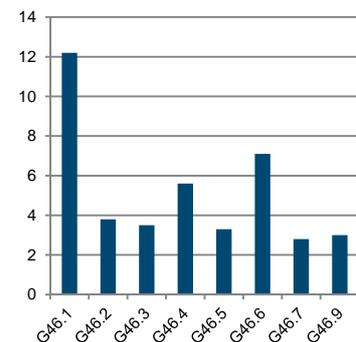
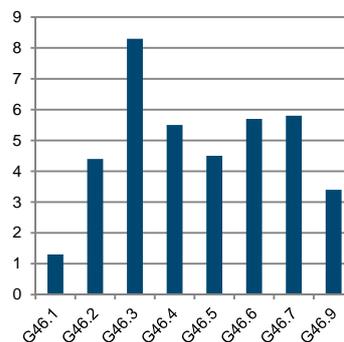
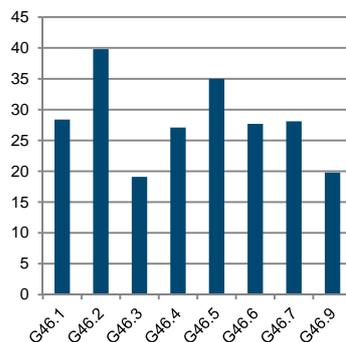
No. of persons employed per  
enterprise (in 1,000)

Gross operating rate (in %)

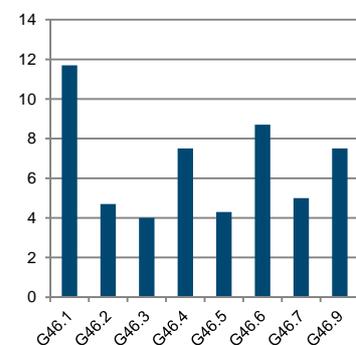
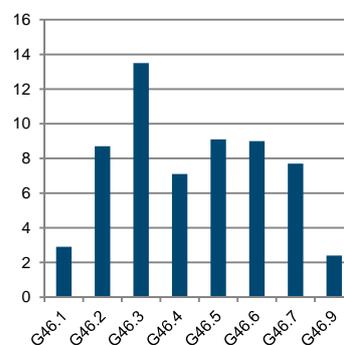
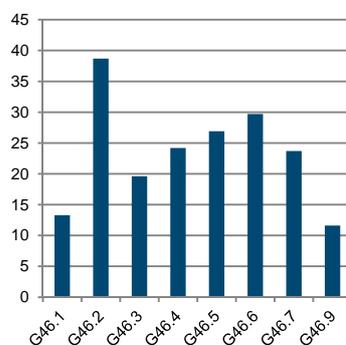
### Cyprus



### Latvia



### Lithuania



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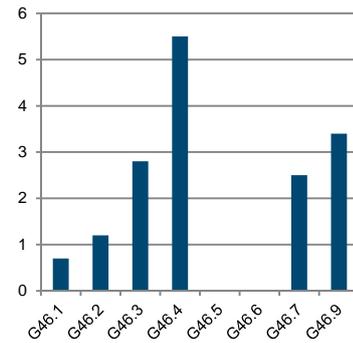
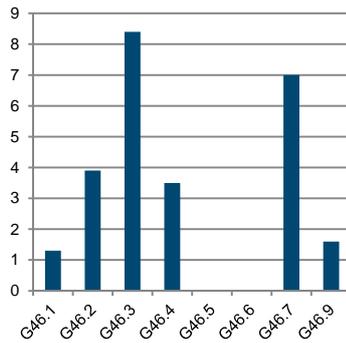
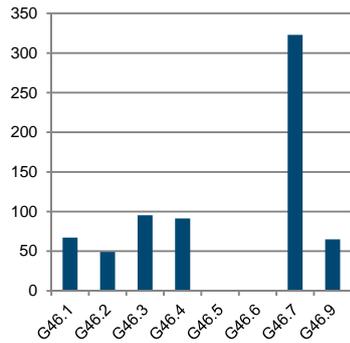
**Figure 89 / ctd.**

Value added per person employed  
(in 1,000 EUR p.p.)

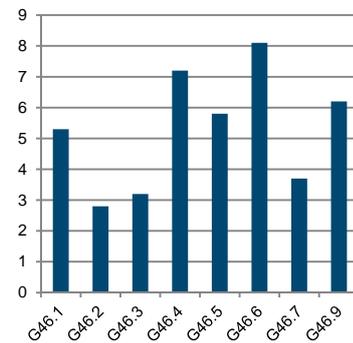
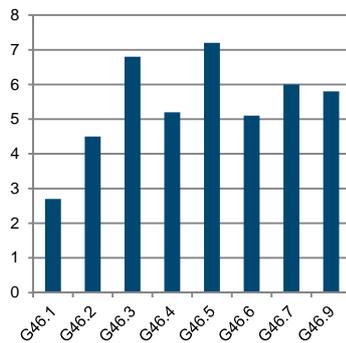
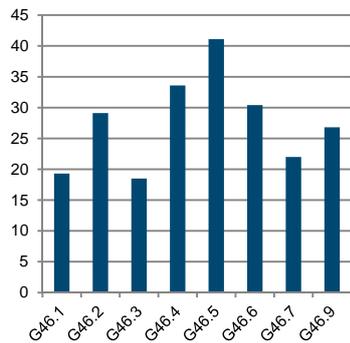
No. of persons employed per  
enterprise (in 1,000)

Gross operating rate (in %)

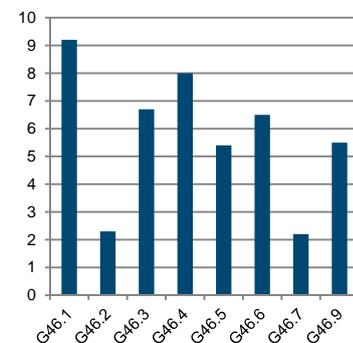
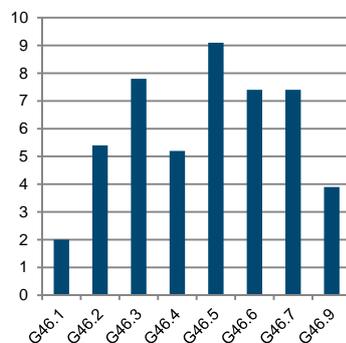
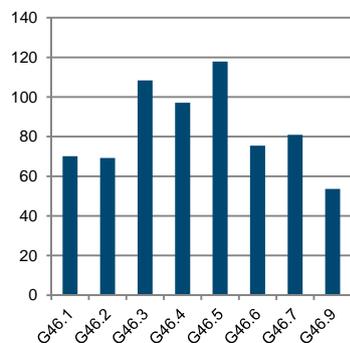
**Luxembourg**



**Hungary**



**Netherlands**



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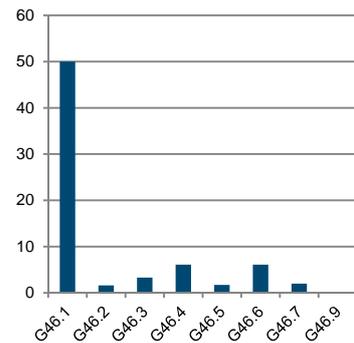
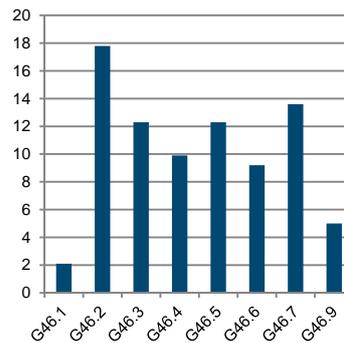
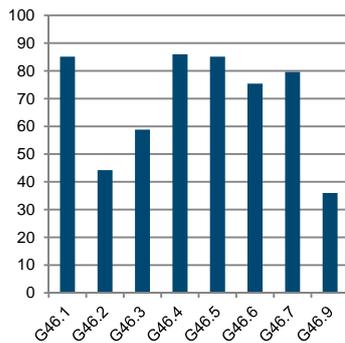
**Figure 89 / ctd.**

Value added per person employed  
(in 1,000 EUR p.p.)

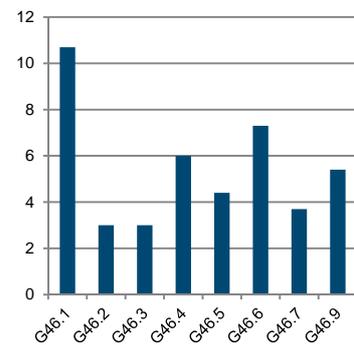
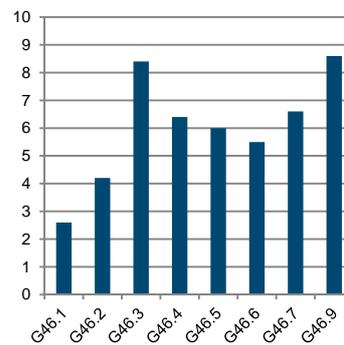
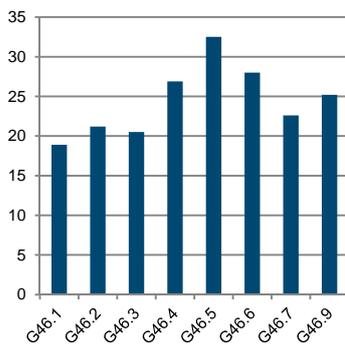
No. of persons employed per  
enterprise (in 1,000)

Gross operating rate (in %)

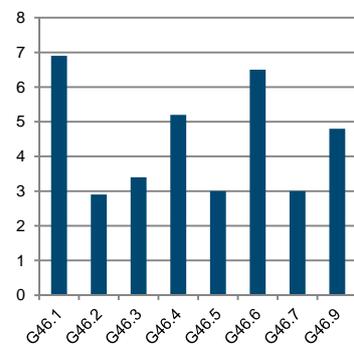
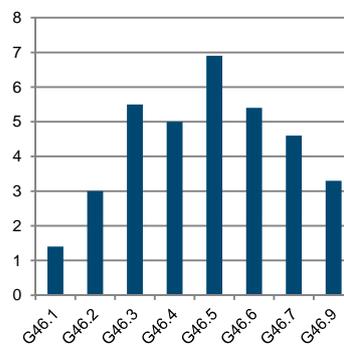
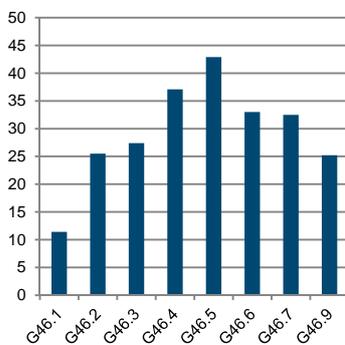
### Austria



### Poland



### Portugal



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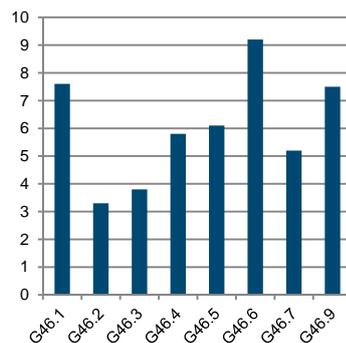
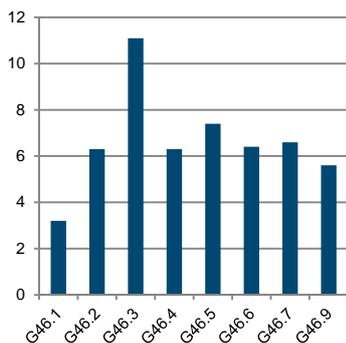
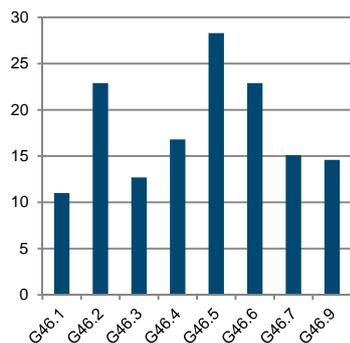
**Figure 89 / ctd.**

Value added per person employed  
(in 1,000 EUR p.p.)

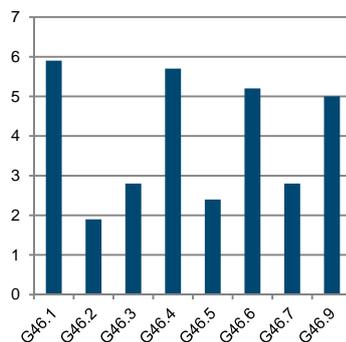
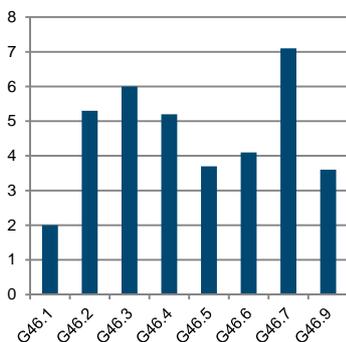
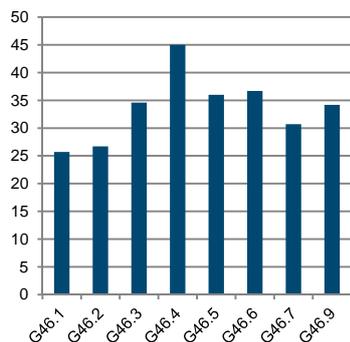
No. of persons employed per  
enterprise (in 1,000)

Gross operating rate (in %)

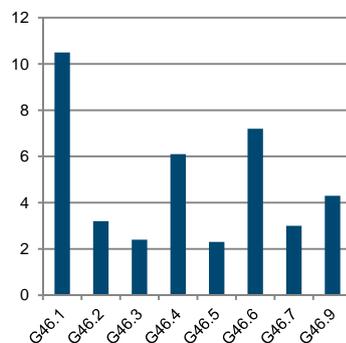
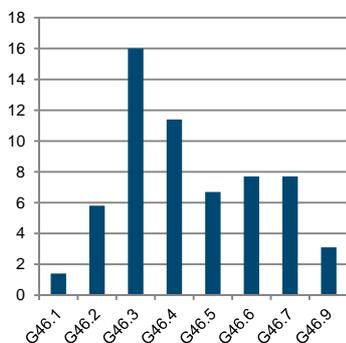
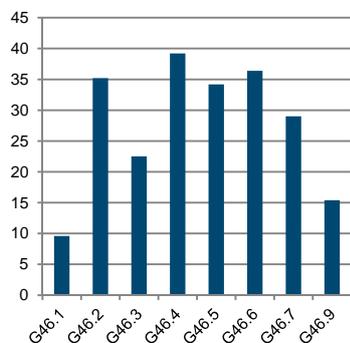
**Romania**



**Slovenia**



**Slovakia**



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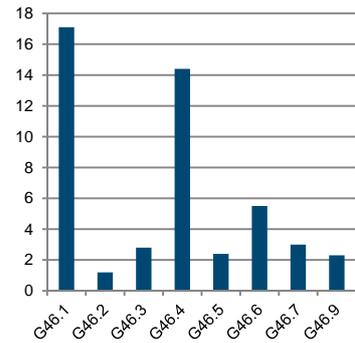
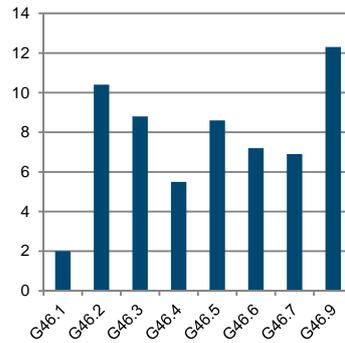
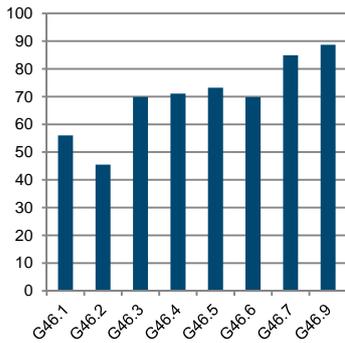
**Figure 89 / ctd.**

Value added per person employed  
(in 1,000 EUR p.p.)

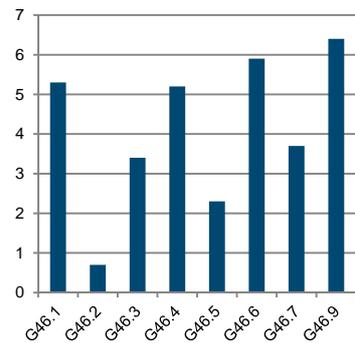
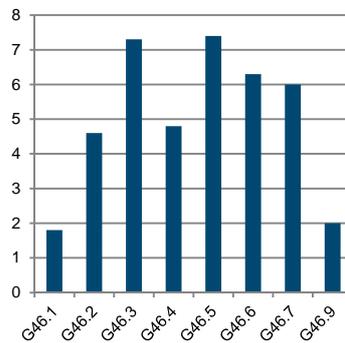
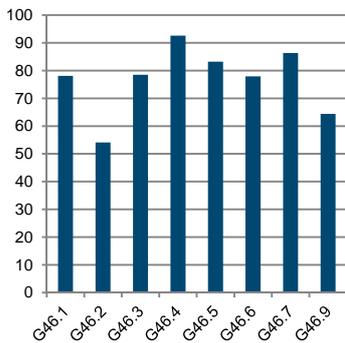
No. of persons employed per  
enterprise (in 1,000)

Gross operating rate (in %)

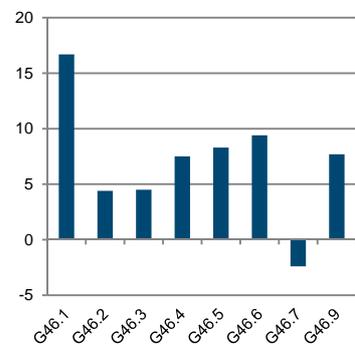
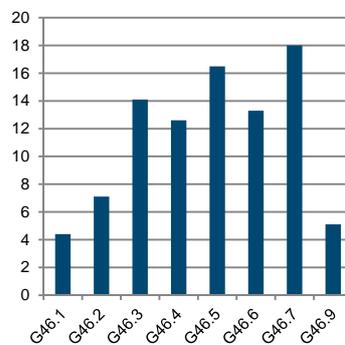
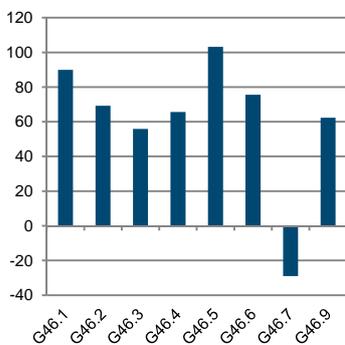
**Finland**



**Sweden**

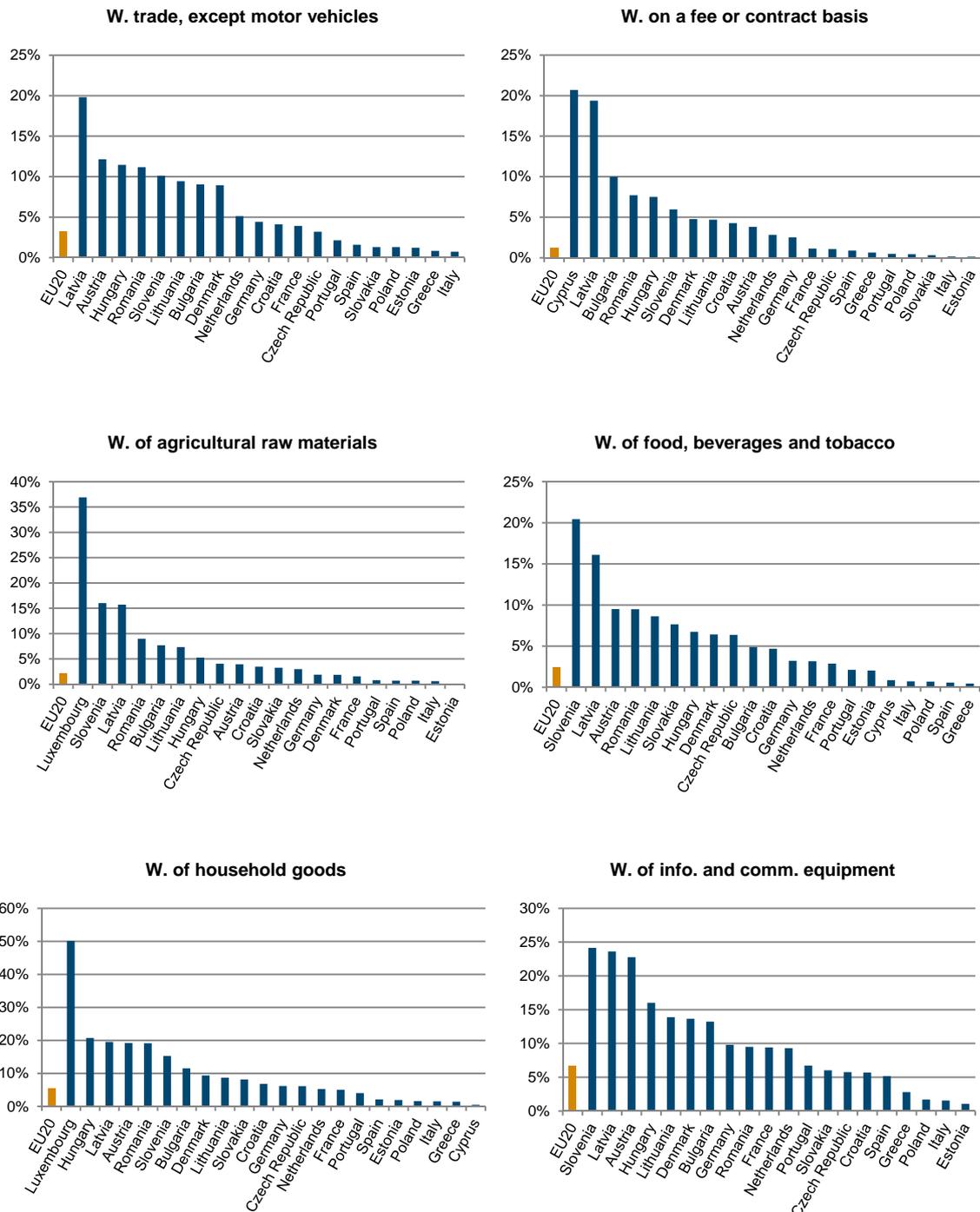


**United Kingdom**



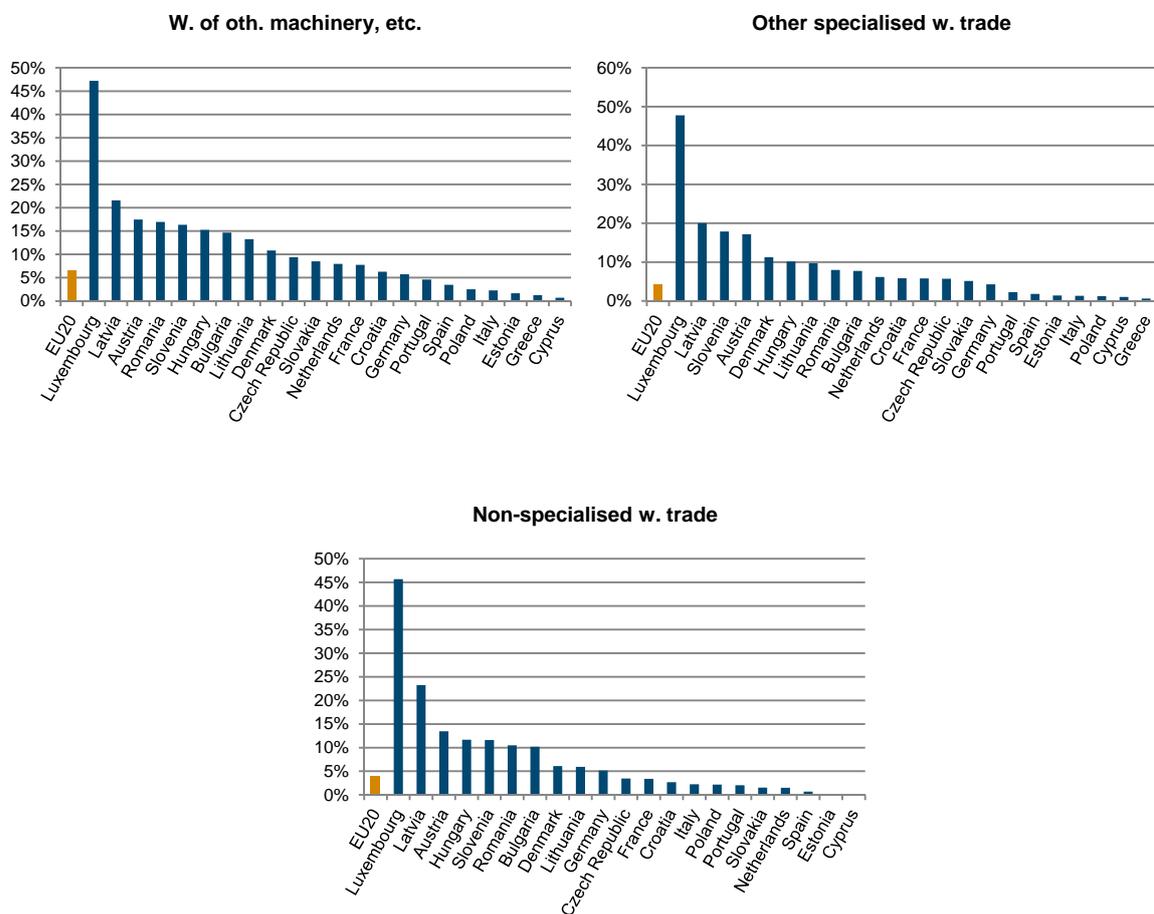
Source: Eurostat, Structural Business Statistics (sbs\_na\_dt\_r2), own calculations.

**Figure 90 / Shares of foreign-owned firms on the total firm population – NACE 3-digit level, 2013**

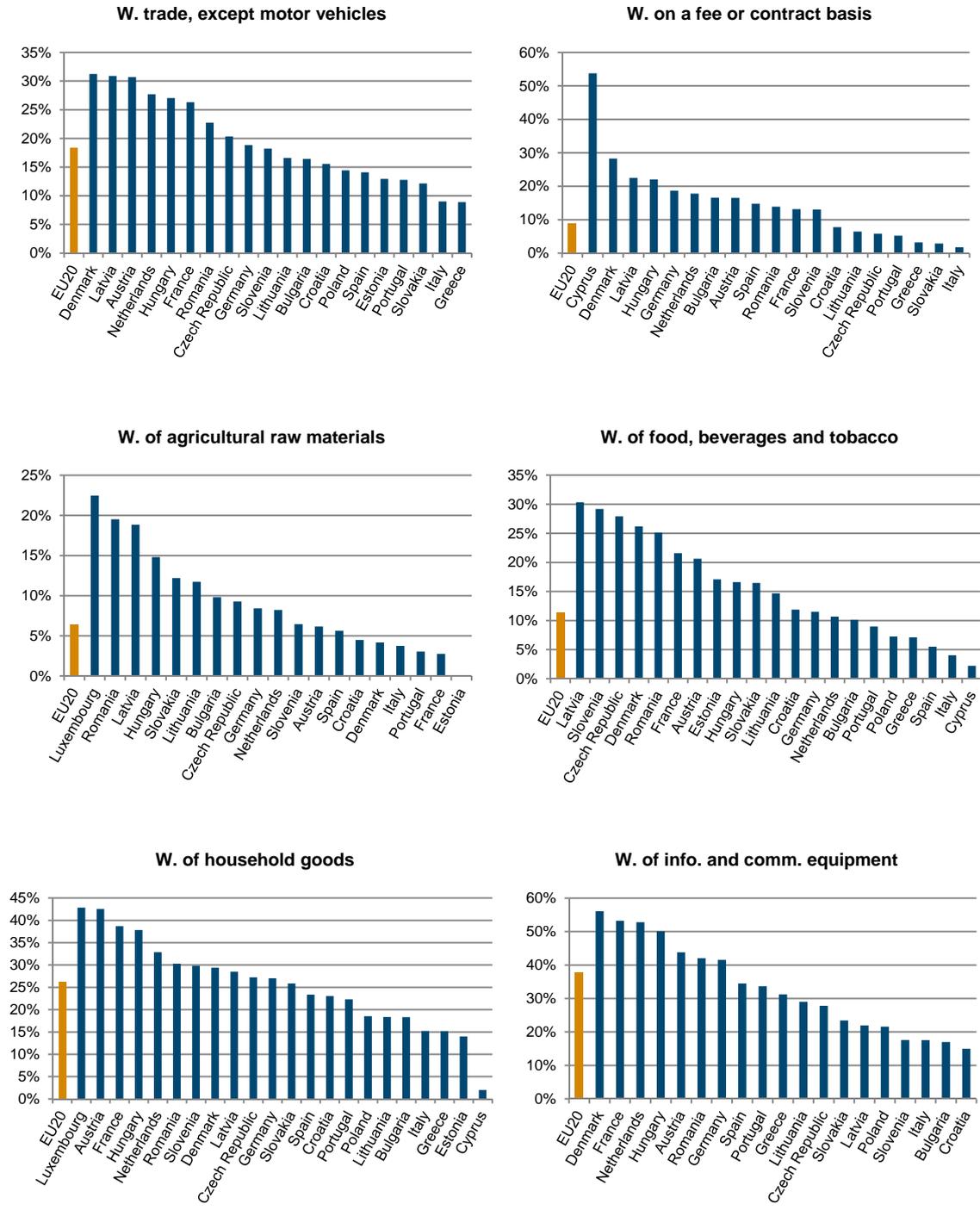


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Figure 90/ ctd.

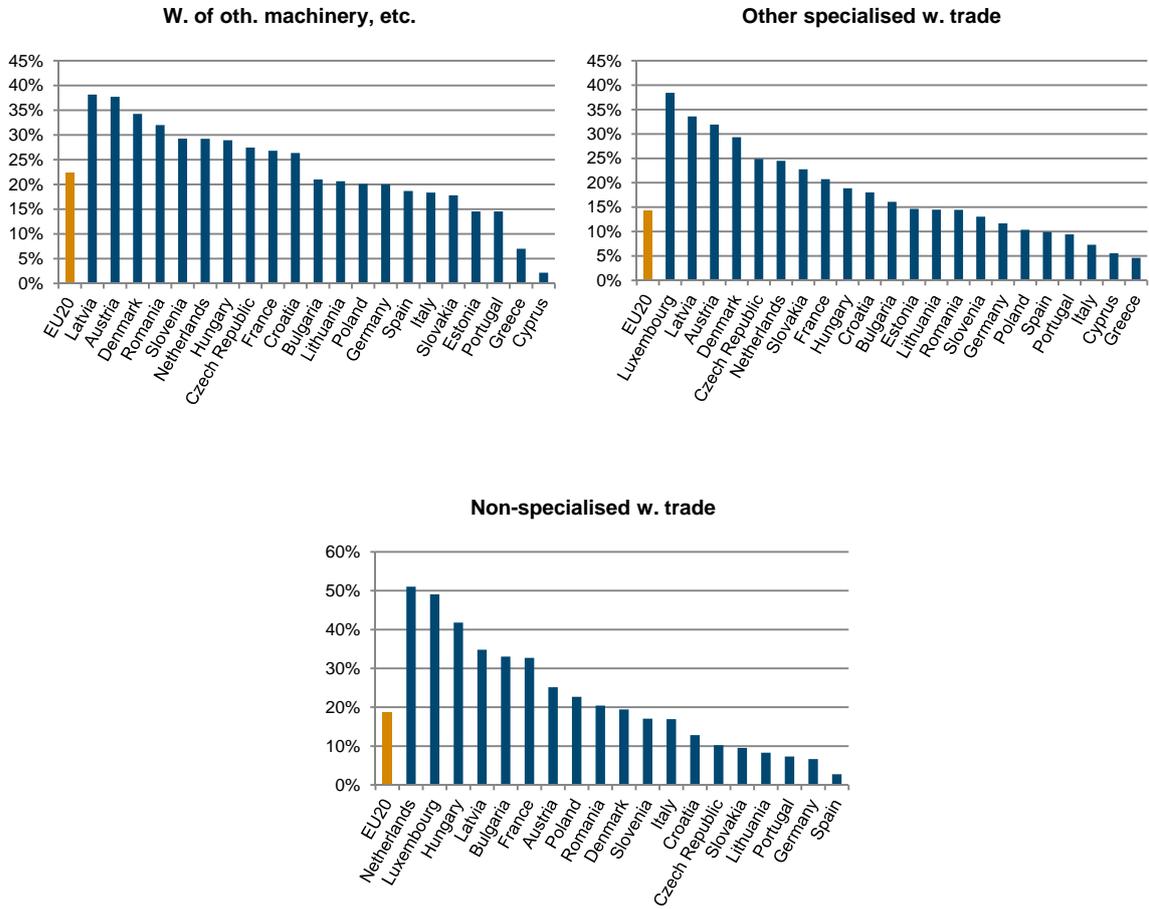


**Figure 91 / Shares of foreign-owned firms in persons employed – NACE 3-digit level, 2013**

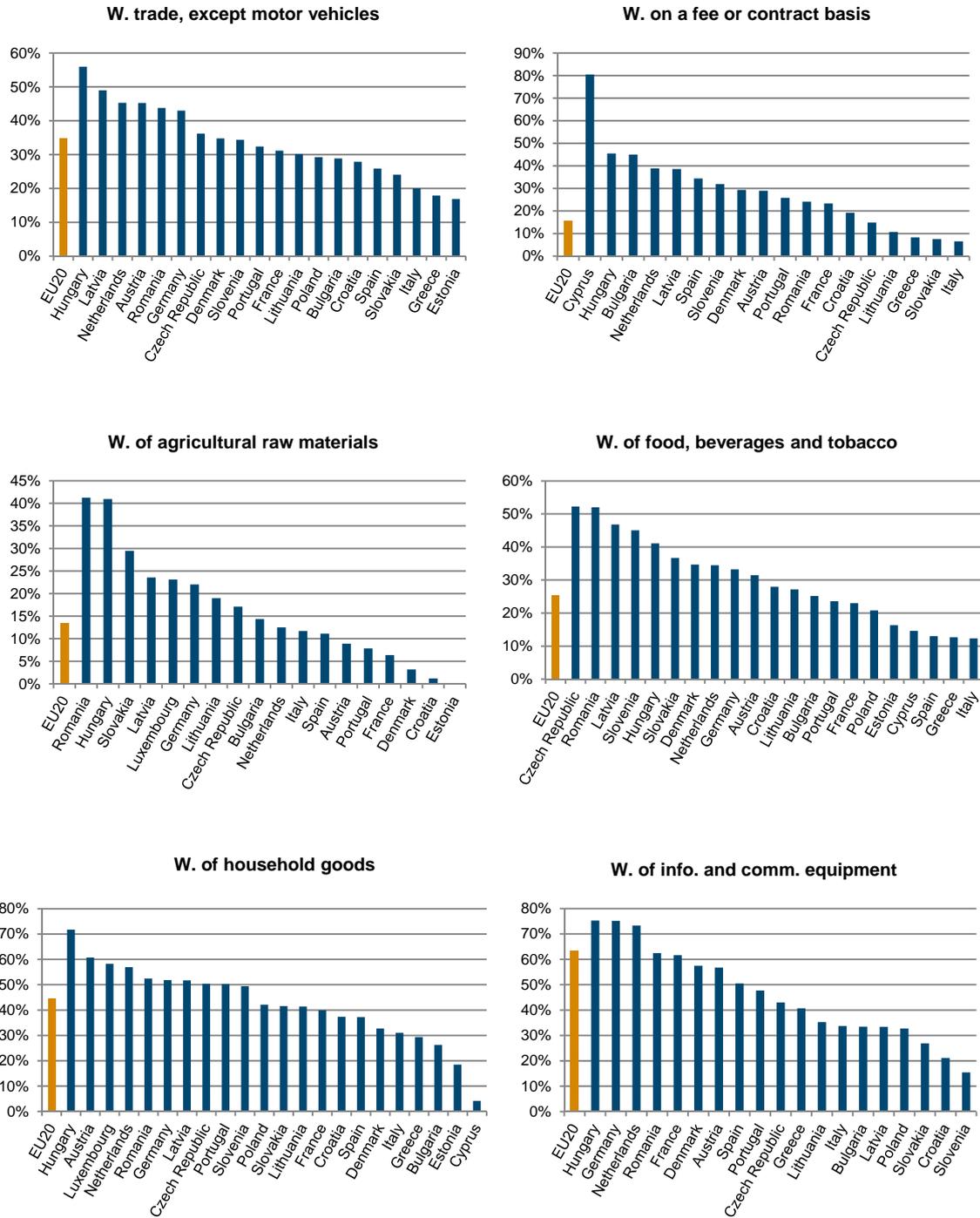


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Figure 91 / ctd.

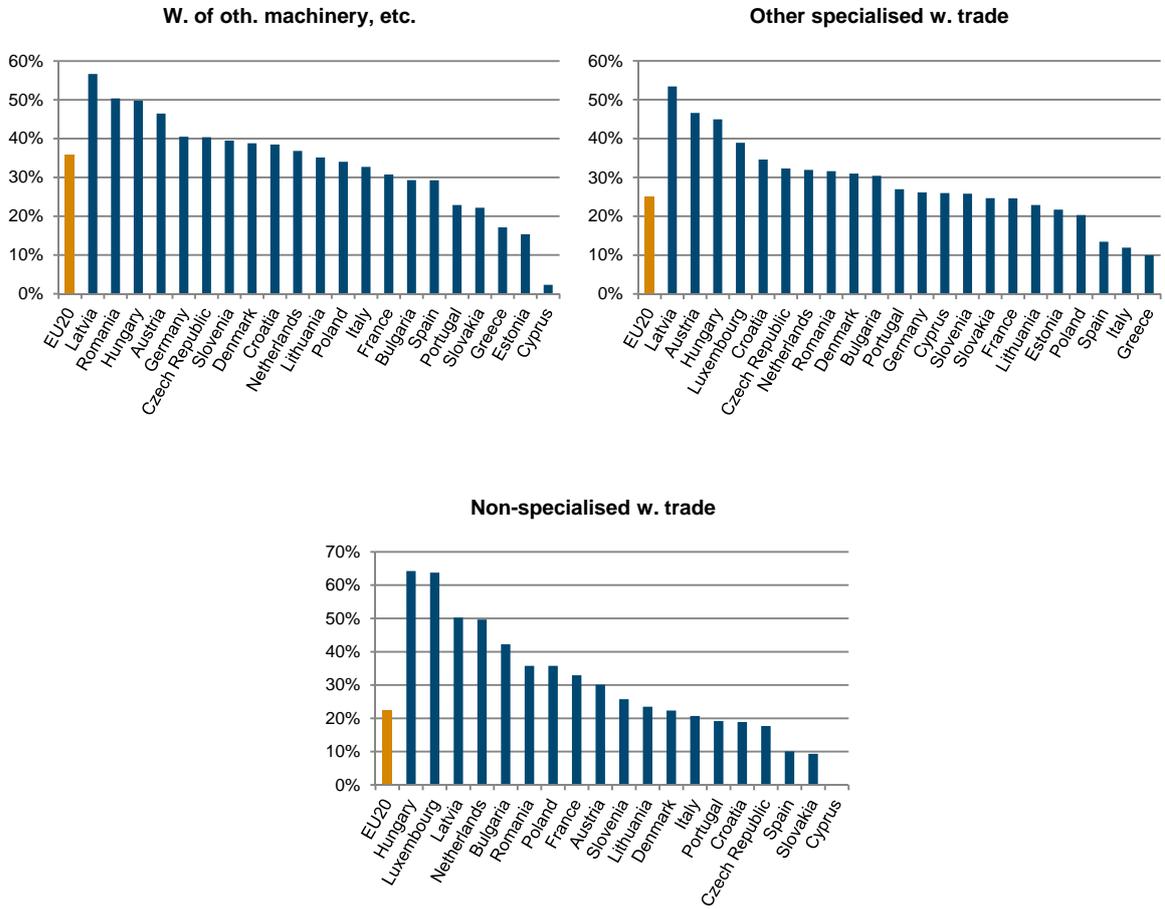


**Figure 92 / Shares of foreign-owned firms in value added – NACE 3-digit level, 2013**



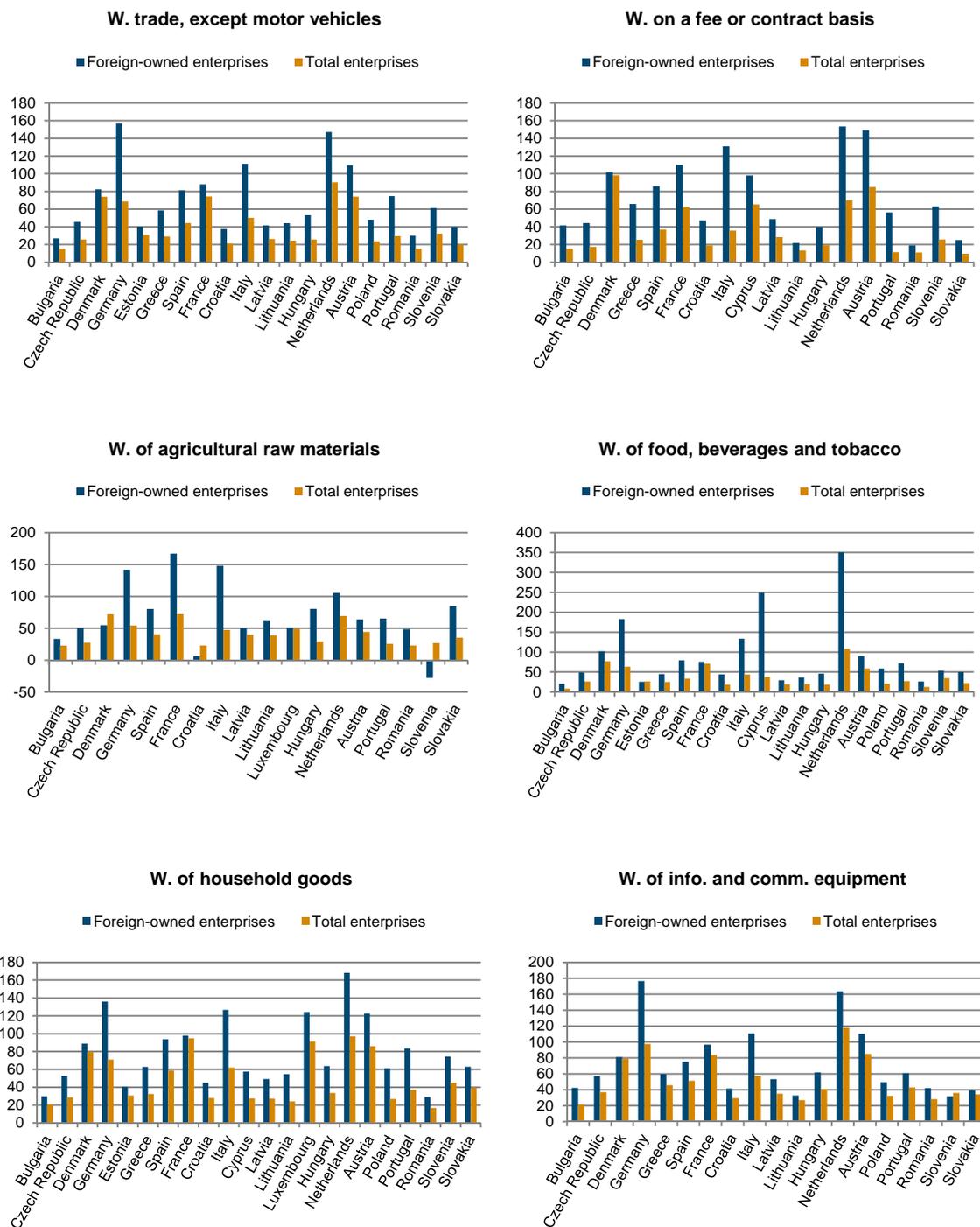
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Figure 92 / ctd.



**Figure 93 / Labour productivity of foreign-owned and domestically owned firms – NACE 3-digit level, 2013**

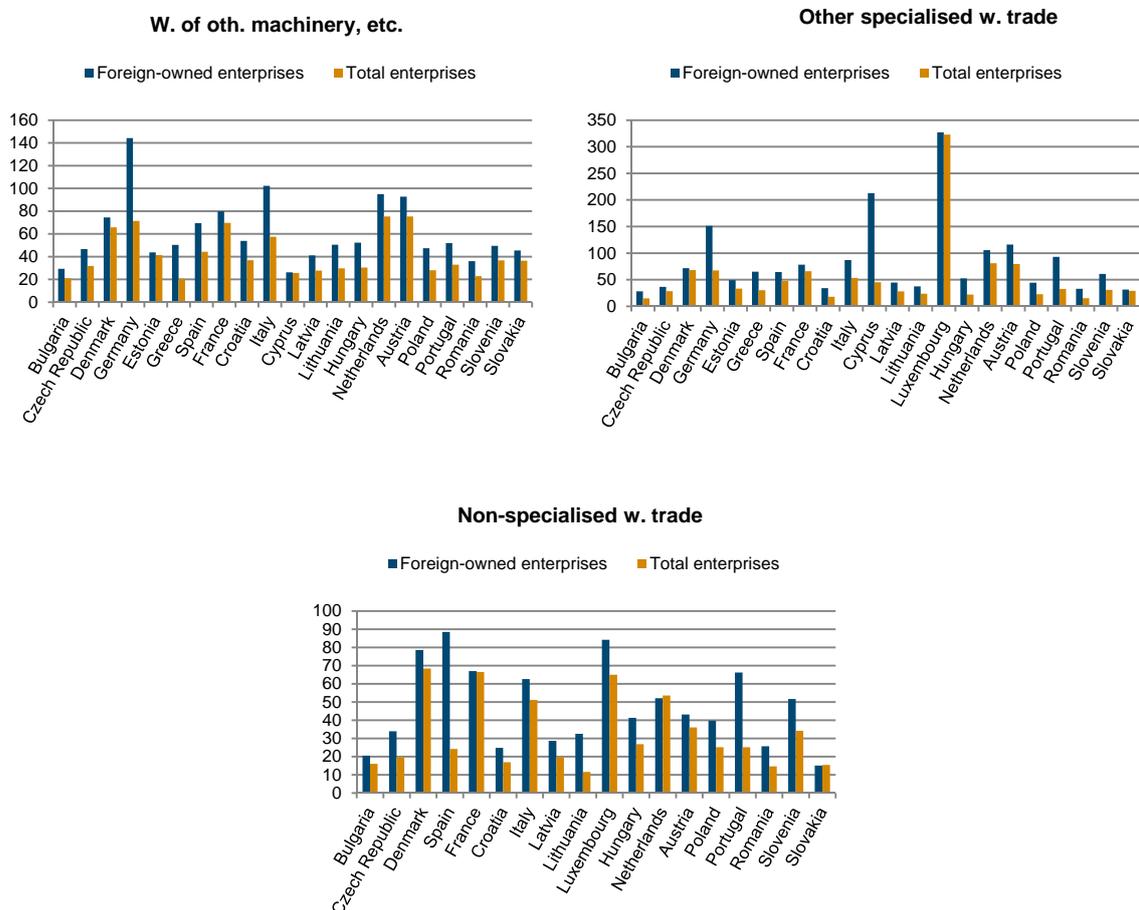
Apparent labour productivity (in 1,000 EUR p.p.)



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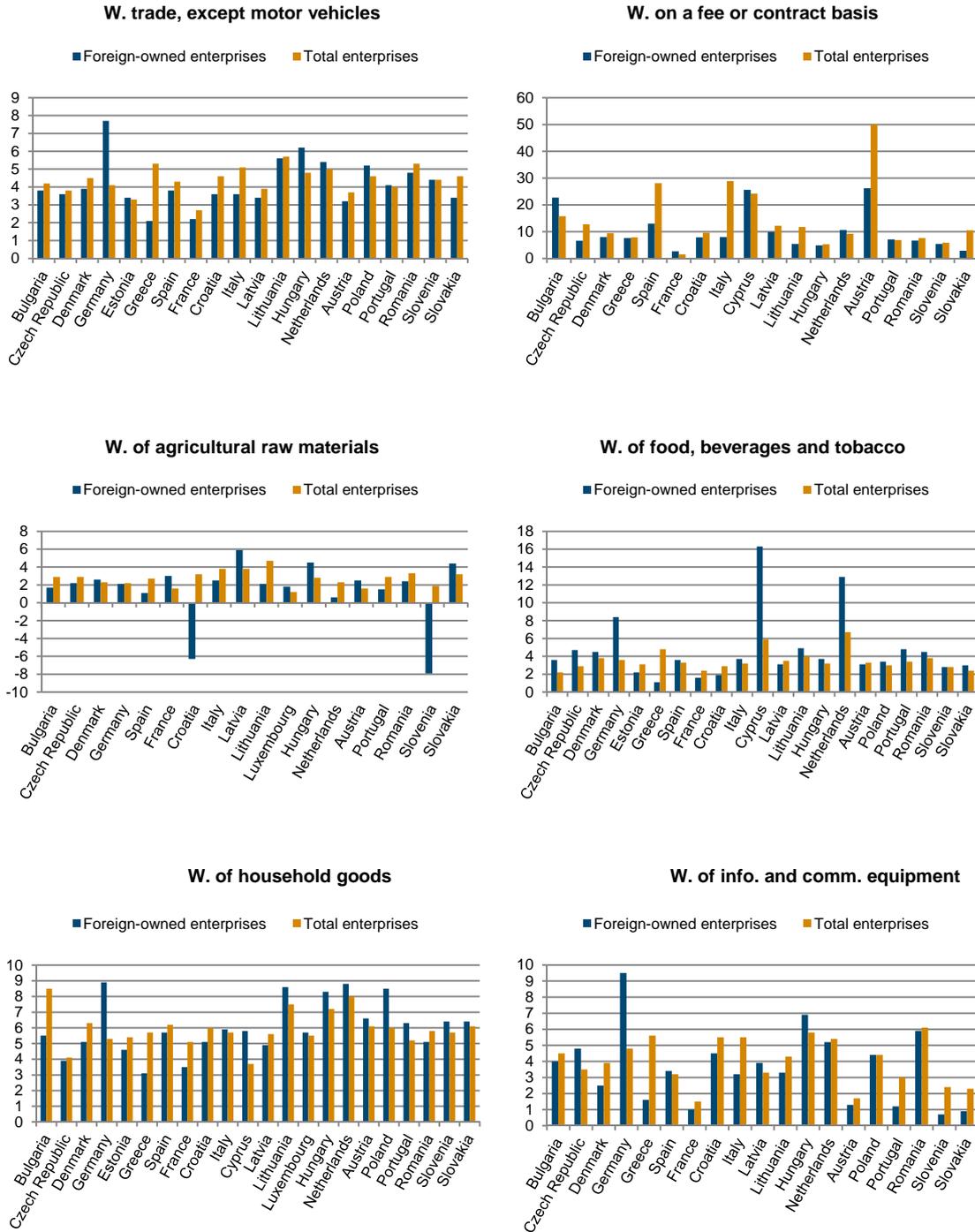
Figure 93 / ctd.

Apparent labour productivity (in 1,000 EUR p.p.)



**Figure 94 / Profitability of foreign-owned and domestically owned firms – NACE 3-digit level, 2013**

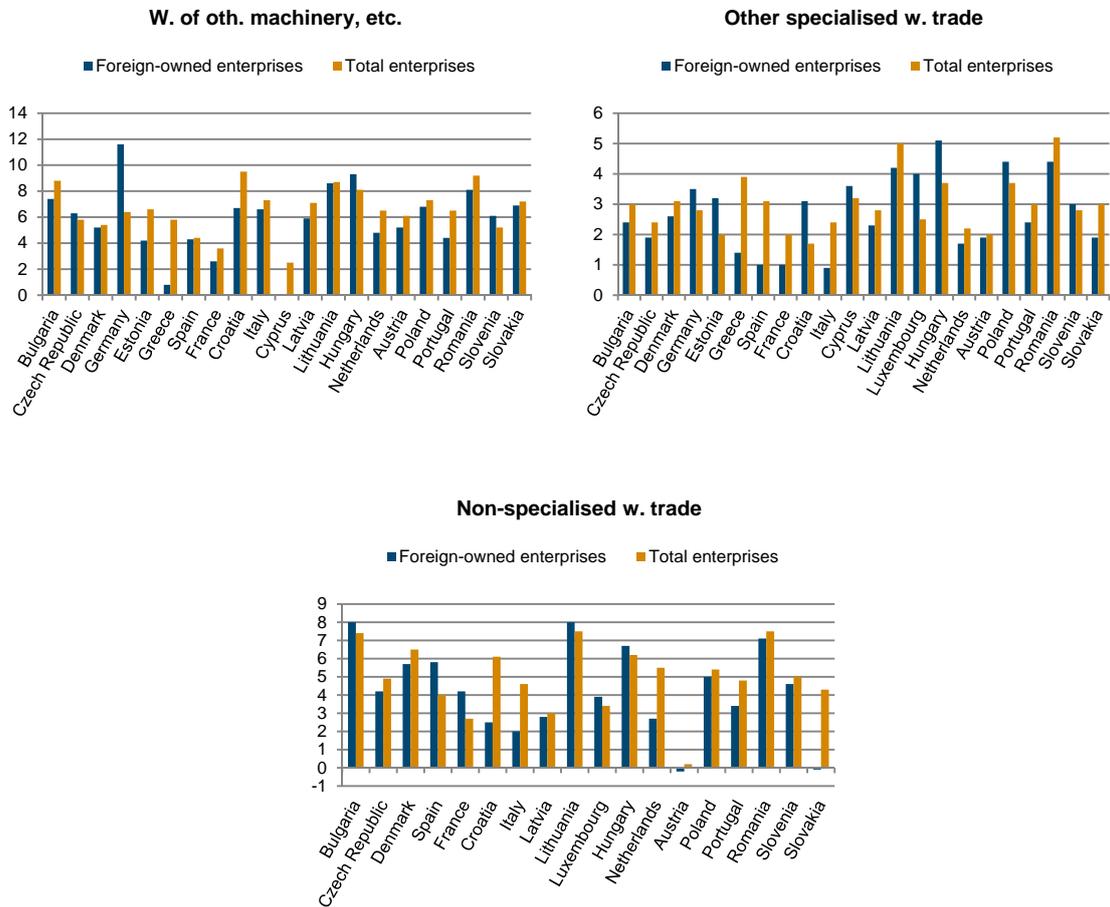
Gross operating rate (in %)



ctd.

Figure 94 / ctd.

Gross operating rate (in %)



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