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STRUCTURAL FEATURES OF DISTRIBUTIVE TRADES AND THEIR IMPACT ON PRICES IN THE EURO AREA

SEPTEMBER 2011

Structural Issues Report

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STRUCTURAL ISSUES REPORT

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ABBREVIATIONS AND GLOSSARY

COUNTRIES

BE	Belgium	CY	Cyprus
DE	Germany	LU	Luxembourg
EE	Estonia	MT	Malta
IE	Ireland	NL	Netherlands
GR	Greece	AT	Austria
ES	Spain	PT	Portugal
FR	France	SI	Slovenia
IT	Italy	SK	Slovakia
		FI	Finland

OTHER

COGS	cost of goods sold
COICOP	Classification of Individual Consumption According to Purpose
CPI	Consumer Price Index
CRk	k-firm concentration ratio
DSGE	dynamic stochastic general equilibrium
ECB	European Central Bank
EMU	Economic and Monetary Union
EPL	employment protection legislation
ESCB	European System of Central Banks
EU	European Union
FDI	foreign direct investment
GDP	gross domestic product
HHI	Herfindahl-Hirschman Index
HICP	Harmonised Index of Consumer Prices
ICT	information and communication technology
IPN	Inflation Persistence Network
NACE	statistical classification of economic activities in the European Union
NCB	national central bank
NUTS	Nomenclature of Territorial Units for Statistics
OECD	Organisation for Economic Co-operation and Development
PMR	product market regulation
PPLD	pseudo price level data
PPP	purchasing power parity
RPLI	relative price level index
SBS	structural business statistics
TFP	total factor productivity
VAT	value added tax
WDN	Wage Dynamics Network

GLOSSARY

Buying group: a group that uses the collective bargaining power of its members (firms and entrepreneurs) to negotiate more competitive product prices.

Discounter: a retail entity that typically uses a relatively small sales area to offer a limited range of products at a discounted price.

Hypermarket: a retail facility that combines a supermarket and a department store and usually has a sales area of above 2,500m².

Non-financial business sector: comprises the total economy, excluding the agriculture and fishing, financial intermediation services and public services sectors.

Private label: the own company brand of a retailer (usually produced by an outside firm).

Quaranta table: a diagnostic tool for the checking and approval of purchasing power parity survey results.

EXECUTIVE SUMMARY

The distributive trades sector, which is primarily accounted for by wholesale and retail trade, is not only economically important in its own right, but also relevant to monetary policy. Ultimately, it is retailers who set the actual prices of most consumer goods. They are the main interface between producers of consumer goods and consumers, with around half of private consumption accounted for by retail trade. The "value added" of this intermediation service can be substantial, as this accounts for, on average, about 25% of consumer prices. The purpose of this report is to analyse the structural features of the distributive trades sector and the developments within it, as well as how these may influence prices and price dynamics.

Several aspects are relevant. From a monetary policy point of view, increasing the degree of competition in the distributive trades sector may have effects not only on price levels, but also on price dynamics, via a reduction in mark-ups, an increase in price flexibility and a greater and more rapid pass-through of changes in costs to prices. Structural developments, such as the increasing market penetration of hard discounters, online trade and private label brands, the role of buying groups and the relative bargaining power between producers and retailers are of great importance to consumers and price determination. In addition, these may have implications for the measurement of consumer prices and inflation. More generally, the distributive trades sector plays an important role in determining cross-country differentials in productivity growth, both within and outside Europe: the sector has accounted for over one-third of the widening gap in aggregate productivity between the euro area and the United States since the mid-1990s.

A specific contribution of this report is the use of a wide range of data sources,[1] including a unique dataset on the location of over 100,000 individual grocery stores across most of the euro area, to investigate how to better measure the degree of competition and concentration in this sector, and to compare sector developments from a national, regional and local perspective.

AN OVERVIEW OF THE DISTRIBUTIVE TRADES SECTOR

The distributive trades sector covers three broad sub-sectors: motor, wholesale and retail trade. This report primarily focuses on wholesale and retail trade. In general, wholesalers intermediate between firms, whereas retailers intermediate between firms and consumers. Depending on which measure is considered, the distributive trades account for a varying proportion of the non-financial business sector: around one-third in terms of total turnover, number of firms and self-employment and around 15% to 25% in terms of other measures, such as value added and overall employment. Although by some measures (most notably value added) the wholesale trade sub-sector is larger than the retail trade sub-sector, this report focuses on the latter owing to the fact that it is closer to consumers and consumer prices; retail trade is also more important with regard to direct employment.

The distributive trades in general, and retail trade in particular, have a number of distinguishing features in relation to the rest of the non-financial business sector. They are generally more labour-intensive and have more lower-skilled workers on average. Profit margins in both retail and wholesale trade are below average, but this may simply reflect a high degree of turnover (per unit of capital employed) rather than strong competitive pressures.

The retail trade sub-sector also displays significant diversity across both euro area

1 In particular, it utilises: (i) time series provided by national statistical institutes on regional consumer price indices broken down across a number of product groups, as well as information from private databases (such as store location data from Nielsen and retailing and consumer goods-related modules from Euromonitor Passport); (ii) detailed data and the "Quaranta tables" from Eurostat's PPP database; (iii) individual price and survey data collected under both the Inflation Persistence Network and Wage Dynamics Network of the Eurosystem; and (iv) country-specific information provided by ESCB staff, which is used to construct a new indicator of the degree of regulation on shop opening times.

countries and segments. Substantial price differences exist between branded and private label goods and also across store types. The rapid growth of discounters, of private label brands and of online trade, clearly visible to consumers, has had a noteworthy impact, but this has been of varying importance across countries. Buying groups affecting the bargaining power between producers and retailers, although less well-known to consumers, are also important in price-setting.

The acquisition cost of goods sold represents the single biggest cost incurred by the distributive trades sector, albeit with some notable variation in magnitude across sectors. In terms of importance, this is generally followed by labour costs. The cost structure, as a whole, plays a significant role in explaining price-setting, and analysing this can help explain differences in the rate of pass-through of costs across sectors. More generally, differences in cost structures and the resulting profit margins across countries for given segments may be indicative of differing degrees of competition.

As regards the labour market, the distributive trades sector accounts for a high percentage of self-employed and part-time workers, as well as young and female workers. On average, these account for a high proportion of low-skilled, low-productivity and, consequently, low-paid labour. They also account for a significant proportion of the new jobs created over the last 15 years. Much of the growth in turnover and employment within the sector has come from larger firms, reflecting the fact that this historically fragmented sector is gradually consolidating.

Although the report focuses on the distributive trades sector in euro area countries, it also considers developments in this sector in some of the EU's newer Member States. Many large euro area retailers have invested substantially in the new Member States and have undoubtedly contributed strongly to the modernisation, expansion and productivity of the distributive trades here. Nonetheless, notwithstanding the substantial changes and convergence that have already occurred, there remains some heterogeneity, both with regard to the euro area countries and within the new Member States themselves.

MEASURING REGULATION AND COMPETITION IN THE DISTRIBUTIVE TRADES SECTOR

Regulation and competition in the distributive trades sector are key issues and are discussed in some detail within this report. As regards regulatory issues, there are a large number of areas of activity that are subject to specific regulations in the sector, covering issues as diverse as the setting-up of establishments, contractual relationships with suppliers, opening hours, price controls, promotions and sale conditions, and waste and recycling. These vary substantially across countries and regions, as well as in terms of products and store type/size. An appropriate degree of regulation is a necessary feature of a market economy; however, excessive or badly designed regulation can hinder competition and favour incumbents. In addition, general planning regulations have often been cited by competition authorities as playing an important role in creating barriers to entry or expansion in the distributive trades. Fragmented national, regional and local commercial planning frameworks, in conjunction with different rules on property and land ownership, are factors likely to dissuade entrepreneurs and firms from entering certain markets. These regulations may also have unintended consequences. Indeed, some commentators partly attribute the growth of discounters to planning restrictions, as discounters frequently fall below specified size thresholds subject to additional restrictions.

While they may facilitate cross-country comparisons, summary measures of product market regulation need to be interpreted with caution and should not be taken at face value. In this report, a new indicator of shop opening time restrictions is developed using detailed country-level information, which allows for a more nuanced and differentiated view on

this issue. More generally, while there is clear evidence of an easing in the degree of product market regulation in the distributive trades sector across almost all countries, there remains considerable scope for further progress.

Regulatory differences across countries may also impede online commerce in general and cross-border e-commerce in particular. The strong growth, but relatively low market share, of domestic online commerce and the importance of physical cross-border retail shopping in many parts of the euro area illustrate the potential for cross-border e-commerce. This is all the more so in view of the evidence that online prices can differ significantly across countries and that consumer choice is often restricted because domestic online suppliers only offer a limited range of products.

Measuring effective competition in the distributive trades sector is particularly difficult. This report tries to improve our understanding in this area. It considers a number of different indicators (concentration, profitability, pass-through) at different levels of spatial (local, regional and national) and organisational (store, parent company and buying group) aggregation, as well as both upstream (producer-related) and downstream (consumer-related) aspects. These can provide differing messages. At the national level, a number of key results are found. A general finding is that concentration is relatively low at the national level in southern European countries owing to the persistence of a more traditional retail structure. The degree of concentration also varies substantially across the retail sub-sector, being highest for electronics and appliances and grocery retailing. Over time, a slight upward drift in concentration has been observed for most retail segments, reflecting the ongoing consolidation in European retail trade. Lastly, there tends to be a positive correlation between concentration and profitability measures, possibly partly related to efficiency gains.

Regional and local measures of competition are also constructed by using a unique dataset on the location of over 100,000 individual grocery stores spread across the euro area. As regards which level is "best", this may depend on the perspective involved. For example, for large producers, competition might be best considered at the national or supranational level. For food and grocery producers, competition might be primarily regional, whereas, for consumers, it might be local. Considering first the results for the downstream (consumer) market, while there are some similarities with the results obtained when using national data, there are also some noteworthy differences: some markets that appeared to be relatively fragmented at the national level actually turned out to be quite concentrated at the local level and vice versa. As for the upstream market, concentration measures using buying group information generally provide a relatively similar picture to store-level measures, albeit with certain differences. Overall, the key message is that measuring the degree of competition in retail trade is not a straightforward matter; this is an issue that should be carefully considered along a number of different dimensions.

THE ROLE OF THE STRUCTURAL FEATURES OF THE DISTRIBUTIVE TRADES SECTOR IN EXPLAINING DIFFERENCES IN PRICE LEVELS AND DYNAMICS

Given that the intermediation services provided by the distributive trades sector account for a large part of consumer prices and that distributive services are not generally traded internationally, this report considers to what extent the structural aspects of the retail sub-sector, combined with other indicators, help to explain differences in price levels, price dynamics and convergence. The main findings are as follows.

1) There remains a *considerable degree of price dispersion* across the euro area; this is lower on average for goods than for services, but it is still sizeable in most cases – tending to be lower for electronics and for clothing and footwear and higher for food products. The evidence points to a limited degree of price convergence that appears to come to a halt around the period 2004 to 2006. There is

also compelling evidence of a strong "border effect" on price differentials across euro area countries, which suggests ample scope for further improving the Single Market. The structural and regulatory features of the distributive trades sector appear to help explain differences in price levels across countries.

2) Using information drawn from the Inflation Persistence Network and the Wage Dynamics Network of the Eurosystem, the report considers price-setting behaviour. It finds that *higher competition is associated with more frequent price changes* in the retail sub-sector. Another finding is that price changes are more frequent in supermarkets and hypermarkets, though not larger in average magnitude. These results hold across countries and product types.

3) Using a combination of two unique datasets, the report examines the relationship between price dynamics at the regional level and competition (measured at different levels of organisational and spatial aggregation and across a number of product groups). It finds that *higher market concentration has, in recent times, been associated with higher price growth for food and drink products*. The interpretation of this correlation calls for further research, but it does appear to be robust and to hold across individual countries.

4) This report also considers the magnitude and speed of cost pass-through. As a stylised fact, *producer prices show a stronger and faster reaction to cost shocks than consumer prices*. However, there is large dispersion in respect of the transmission of costs to prices across countries and sectors. The degree of competition appears to be positively related to the long-run pass-through of import prices to consumer prices. As regards food prices, a more pronounced presence of discounters seems to be associated with a higher pass-through. In the clothing segment, changes in import prices are not fully transmitted to consumer prices.

CONCLUSIONS AND POLICY IMPLICATIONS

1) This report contributes to a better understanding of the impact of the structural features of the distributive trades sector on prices and price-setting behaviour, thereby improving on previous research in this area. From a policy perspective, it highlights the importance of structural reforms that help enhance competition in this sector.

2) The findings regarding the impact of structural features on price-setting behaviour and on price level differences across euro area countries suggest that further progress in improving effective competition in the distributive trades sector could help reduce border effects, narrow price differentials, strengthen the Single Market and enhance the effectiveness of monetary policy.

3) As concerns product market regulation, although there is evidence of an easing in the degree of regulation impacting the distributive trades sector across almost all euro area countries, there remains considerable scope for further progress. However, the indicators available for this analysis may only capture some aspects of regulation.

4) With regard to labour markets, the distributive trades sector has the potential to be a major contributor to job growth, particularly for specific groups of the labour force, such as the low-skilled. Given the "Europe 2020" growth strategy of the EU, and in view of the high unemployment rates arising from the crisis, this would be an important point to consider. However, sector-specific product market and more general labour market structural rigidities may impede productivity growth and job creation in this sector.

5) All in all, a crucial step towards further progress would be the full implementation of the Services Directive. The benefits arising from further liberalisation and harmonisation of market conditions may be seen, in part, from the report's finding that higher product market regulation is associated with higher price levels. Moreover, structural reforms in the distributive trades sector could reduce mark-ups and give rise to substantial increases in both output and real wages. In order to unleash the full potential and benefits of online and cross-border trade, remaining regulatory and legislative barriers (such as consumer law and VAT-related issues) need to be addressed. This could also contribute significantly to improving the functioning of the Single Market.

6) The implications of ongoing developments in the distributive trades sector for the measurement of price levels and price changes should also be considered by the relevant bodies to avoid the emergence of biases in measures of consumer price inflation. Relevant issues here would be the analysis of alternative methods to consider new outlets and new product characteristics and prices, as well as how, and when, to introduce them into the HICP basket (e.g. via hedonic regressions or consumer surveys), and the need to ensure that samples are regularly updated and remain representative.

7) This report uses a wide range of data sources – some of which are unique – to study an area that has been under-investigated, especially at the European level. There is, however, ample room for further research in this direction. In particular, it is important to gain further insight into how competition impacts retail price levels at a more disaggregated level (i.e. at the local or regional level rather than at just the national level). In this regard, the collection of more price level data at a highly disaggregated level (e.g. across store types, regions, etc.) would be particularly useful.

INTRODUCTION AND MOTIVATION

The distributive trades, consisting of wholesaling and retailing, are a key sector of the economy. As the main interface between producers and consumers, the sector is particularly important from a monetary policy point of view: this is where most consumer goods prices are ultimately set. Despite almost 20 years of the Single Market, mark-ups in the distributive trades sector can still be substantial and differ considerably across countries, while cross-border trade remains limited. This report examines the structural features of the distributive trades sector which are likely to play an important role in determining price level and inflation differences across countries.

Given its key role in the economy, the distributive trades sector has been studied extensively by policy-makers, though generally from a different perspective. The European Commission recently published the results of its market monitoring exercise, which covers a wide range of issues affecting the retail trades, such as consumer accessibility, relationships with upstream producers, labour markets, logistics and information and communication technology (ICT), as well as energy use.[2] Many national competition authorities have also conducted comprehensive reviews of the distributive trades sector in their countries – for example, those of Ireland and the United Kingdom.[3] These reports illustrate the challenging issues involved and the complex interaction between upstream agents (producers and wholesalers) and downstream agents (retailers), as well as the importance of the regulatory environment in supporting competition in this sector.[4] However, there is relatively little research investigating the impact of the structural features of the distributive trades on prices and price-setting behaviour. The objective of this report is to shed light on these aspects by examining: (a) the main features of, and issues relating to, the euro area distributive trades sector from a monetary policy perspective; and (b) the impact of these features on price levels and inflation behaviour.

The distributive trades sector has been undergoing substantial changes, in terms of, for example, growing consolidation and internationalisation and changing retail formats (e.g. the increasing market shares of supermarkets and hypermarkets, the growth of the discount sector and the expansion of private label brands). These developments influence competition and cost structure and play an important role in determining mark-ups and, thus, affect final consumer prices in the euro area. As regards labour market issues, this sector has contributed significantly to the improvement in employment growth experienced by the euro area during the past decade. However, productivity is comparatively low and the sector accounts for more than one-third of the widening

2 The European Commission's Directorate-General for Health and Consumer Policy also regularly studies the retail markets in its Consumer Markets Scoreboard (CMS), focusing on the integration of the retail internal market, particularly from the consumer perspective. To date, five editions of the CMS have been published (European Commission, (2011b), (2010c), (2010b), (2009) and (2008)). Each of these considers the general progress made in the integration of the retail internal market as well as specific topics. For example, the third and fifth editions of the CMS consider cross-border and online consumer purchases. Both of these issues are discussed in Box 1 of this report.

3 In 2006, the UK Competition Commission (UKCC) initiated, at the request of the country's Office of Fair Trading (OFT), a comprehensive two-year study into the supply of groceries by retailers in the United Kingdom. This is because the OFT believed there were "*reasonable grounds for suspecting that a feature…of the market…prevents, restricts or distorts competition*". The final report (UKCC, (2008)) concluded as follows: *"…in many important respects, competition in the UK groceries industry is effective and delivers good outcomes for consumers, but not all is well. We have concerns in two principal areas. First, we found that several grocery retailers have strong positions in a number of local markets. Second, we found that the transfer of excessive risk and unexpected costs by grocery retailers to their suppliers through various supply chain practices…".* The Competition Authority of Ireland has, in recent years, undertaken two studies related to the distributive trades sector: the first study – the "Grocery Monitor Project" – was initiated following the abolition of the Groceries Order in March 2006 to assess how the grocery retail and wholesale trade in Ireland had responded to the new legislative environment; the second – "Retail-related Import and Distribution Study" – was published in 2009.

4 One key finding from the Irish study was that the retail planning system made it difficult for new retailers to enter the Irish grocery market and for existing retailers to expand their operations. A similar conclusion was drawn by the French competition authority (Autorité de la concurrence) in 2007, prompting a reform of the authorisation procedure for large outlets in France a year later. In February 2011 Germany's federal cartel office (Bundeskartellamt) announced an investigation into the relationship between leading grocery retailers and their suppliers.

in the aggregate productivity gap between the United States and the euro area that has occurred since the mid-1990s. These issues are presented in more detail in Section 1.1 of the report.

As described in Section 1.2, regulation plays a fundamental role in the distributive trades sector, particularly in terms of barriers to entry, operating restrictions and price controls. Although regulation varies primarily at the national level, in some countries, there is also an important regional element, which may help disentangle the effects of regulation from other economy-wide factors. Section 1.3 considers the empirical measurement of competition, which is often assessed in terms of the degree of concentration within a sector. However, the relationship between concentration and price levels and sector dynamics is ambiguous. Regarding price levels, the presence of economies of scale or scope can have a potential downward impact on prices stemming from large, efficient players. But this effect has to be assessed against the potential upward impact from reduced competition. Other things being equal, increased competition should improve efficiency and reduce mark-ups, and thereby lead to lower prices. However, increased competition may also give rise to ongoing dynamic effects via higher productivity levels and growth, which can result in lower inflation as well as lower price levels.

Having set the scene, the second part of the report considers the impact of the structural features of the distributive trades sector on price level differences, price-setting behaviour, regional price change dynamics and the pass-through of costs. These are discussed in Sections 2.1, 2.2, 2.3 and 2.4 respectively. The significance of the regulatory and structural features of the distributive trades for price level differences is underlined in Section 2.1, which also investigates the "border effect" on price differentials. Section 2.2 considers the impact of store formats on price-setting and examines the extent to which structural differences and competition influence the frequency of price changes. However, competition in the distributive trades sector must also be considered from a number of different perspectives – most importantly, spatially (in terms of local, regional, national or supranational markets) and from the position of upstream and downstream agents (although consumers interact with retailers at the individual store level, producers usually interact with retailers at the parent company or even buying group level). Hence, Section 2.3 considers regional price dynamics and the extent to which these are influenced by the measures of concentration calculated at the regional and local level in Section 1.3.

The link between competition and the degree of cost pass-through is, to some extent, ambiguous. In the (theoretical) case of perfect competition, retailers have no option but to fully pass through increases in upstream producer prices, as they have no excess profits that can be used as a buffer. In the case of imperfect competition, where many competing producers sell products that are differentiated from one another, the degree of pass-through will depend on many factors and the link between competition and the extent of pass-through may be less clear. The relationship between the structural aspects of the distributive trades sector and the degree of pass-through is considered in more detail in Section 2.4. An empirical analysis is undertaken for consumer goods in general, and for prices of food and clothing and footwear in particular.

This report uses a wide range of data sources and some unique datasets. More specifically, it utilises: (i) detailed data and the "Quaranta tables" from Eurostat's purchasing power parity (PPP) database to study the impact of competition and regulation in the distributive trades sector on price level differences across countries; (ii) individual price and survey data collected under the Eurosystem's Inflation Persistence Network (IPN) and Wage Dynamics Network (WDN) to consider the impact of competition and the structural features of the distributive trades sector on price-setting behaviour; (iii) country-specific information

provided by ESCB staff[5] to construct a new and more refined indicator of the extent of regulation on shop opening times; (iv) time series provided by national statistical institutes on regional consumer price dynamics (broken down across a number of product groups), which are combined with a unique "census-type" database on grocery store locations. For a complete overview of the main data sources used in this report, see Table A19 in the Appendix.

Given the original and challenging nature of much of the analysis contained in this report, the findings and conclusions in some areas must be considered as preliminary. Nonetheless, the research highlights the fact that the structural features of the distributive trades sector, as well as the degree of competition within it, are of importance to monetary policy-makers whose primary aim is to maintain price stability.

5 These staff are members of the Monetary Policy Committee task force that was responsible for drafting this report.

I AN OVERVIEW OF THE DISTRIBUTIVE TRADES: STRUCTURAL, REGULATORY AND COMPETITION FEATURES

This chapter provides an overview of the distributive trades sector in the euro area in order to give an insight into the key features of the sector that will underpin the analysis in Chapter 2.

I.1 THE IMPORTANCE, STRUCTURE AND PERFORMANCE OF THE DISTRIBUTIVE TRADES SECTOR

This section considers the macroeconomic importance and structure of the distributive trades, including their economic evolution, cost structures and labour market features.

The main findings are that the distributive trades are of key importance in the macroeconomy, both directly and – functioning as intermediaries between producers and consumers – indirectly. They have a number of distinguishing features, generally being more labour-intensive and employing more lower-skilled workers. While profit margins are below average, this may reflect a high degree of turnover (per unit of capital employed) rather than strong competitive pressures. The retail trade sub-sector displays significant diversity across both euro area countries and segments. Key issues are the growing internationalisation of retail trade along with the growth of discounters, of private label brands and of online trade.

I.1.1 DEFINITIONAL ISSUES

The distributive trades function as "intermediaries" between economic agents that are upstream (e.g. producers) and those that are downstream (e.g. consumers). While they generally do not produce goods themselves (although that is changing [6]), they clearly provide a necessary economic service.

The distributive trades sector covers three broad areas: motor, wholesale and retail trade.[7] The motor trade is considered to be a separate sub-sector with quite different characteristics, partly because of the close link between the companies in this field and the automotive industry.[8] Wholesale trade companies generally do not sell directly to consumers, but rather to businesses and retailers. Retailers generally sell directly to consumers, but not necessarily exclusively so. As will be highlighted below, wholesale and retail trade are by far the largest sub-sectors within the distributive trades sector. As a result, and given the specific nature of the motor trade sub-sector, this report focuses primarily on wholesale and retail trade.[9]

ECONOMIC IMPORTANCE OF THE DISTRIBUTIVE TRADES

In the euro area as a whole, the distributive trades sector accounts for approximately 33% of *firms* in the non-financial business sector (see Chart 1).[10] This is a figure that ranges from around 25% in Germany to 40% in Slovakia

6 For example, with the increasing importance of private or own-label brands and with companies in the clothing and footwear segment both producing and selling clothing.

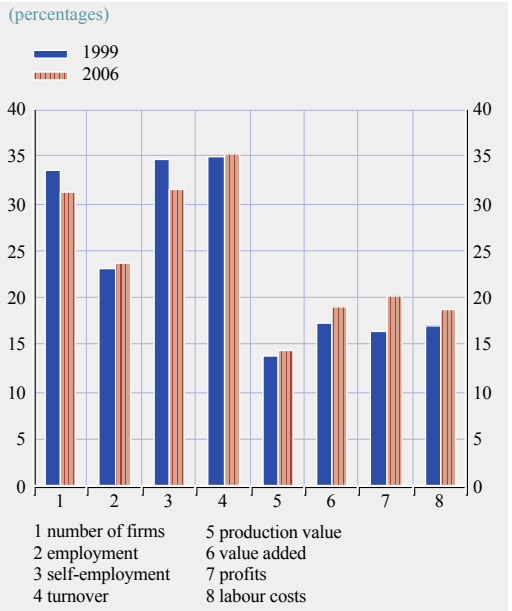
7 Table A20 in the Appendix shows the breakdown and composition of the distributive trades sector according to the NACE Rev. 2 system used by EU institutions for classifying economic activities, which was adopted in 2006 for implementation from 2008 onwards. For reasons of data availability, the previous classification system, NACE Rev. 1.1, is largely used in this report. This is broadly similar to NACE Rev. 2, but there are certain differences.

8 For a more detailed overview of the automotive sector, see the website of the European Commission's Directorate-General for Competition (http://ec.europa.eu/competition/sectors/motor_vehicles/overview_en.html).

9 This section primarily uses data from Eurostat's Structural Business Statistics (SBS) dataset; for an overview of the main datasets used in this report, see Table A19. SBS data are used owing to the rich level of disaggregation at which these data are available, plus the fact that there is a separate module with specific information on the features of the distributive trades. However, it may also be the case that for some countries, owing to changes in methodology, comparisons over long periods of time should be made with caution. For example, as regards the SBS data for Portugal, a gap exists for the period prior to 2004, as the national statistical authority only had access to administrative data from that year onwards. Hence, any comparisons related to the pre-2004 period should be made with care.

10 The non-financial business sector is comprised of the total economy, excluding the agriculture and fishing, financial intermediation services and public services sectors. It includes the mining and quarrying, manufacturing, utilities, construction, distributive trades, hotels and restaurants, transport, storage and communication, and real estate, renting and business activities sectors.

Chart 1 Share of distributive trades in the non-financial business sector



Sources: Eurostat SBS database and Eurosystem staff calculations.

(see Chart A1 in the Appendix), partly reflecting differences in average firm size across countries and sectors. These aspects are discussed in more detail below. In terms of *turnover*, the share of the distributive trades sector is equally substantial, at around 35%, a figure ranging from 30% in Germany to 55% in Greece. However, as the distributive trades essentially provide an intermediation service by buying goods from producers and selling them to consumers, their turnover is not necessarily a good indicator of their economic impact. In this regard, value added provides a more reliable indicator. *Value added* represents the difference between sales and the total cost of all non-labour inputs, including the costs of goods sold. According to this measure, the distributive trades sector accounts for around 20% of the non-financial business sector in the euro area. This figure is relatively lower for Germany, Ireland and Slovakia but relatively higher for Greece and Cyprus, reflecting perhaps differences in the rest of the economy, in particular the performance and size of the industry sector, rather than any features of the distributive trades sector itself.[11] Lastly, productivity in the distributive trades sector is generally below the average for the non-financial business sector. Meanwhile, the *self-employed* (with a share of over 30%) account for a relatively larger proportion of total employment in this sector. These issues are explored in more detail below.

KEY FEATURES OF THE DISTRIBUTIVE TRADES

Thus far, the distributive trades have been discussed as a homogeneous group. However, even at an aggregated level, there are substantial differences between the main sub-sectors (see Chart 2), especially with regard to wholesale and retail trade. Meanwhile, the share of the distributive trades sector accounted for by the motor trade sub-sector varies little between different measures, with values falling within a range from 12% to 16%. By far the largest sub-sector in terms of number of firms and employment is retail trade (particularly in respect of self-employment, where it registers a share of 62%), while wholesale trade is more important in terms of turnover, production value, value added, profits and labour costs. These variations suggest important differences in firm characteristics and productivity levels across the various sub-sectors.

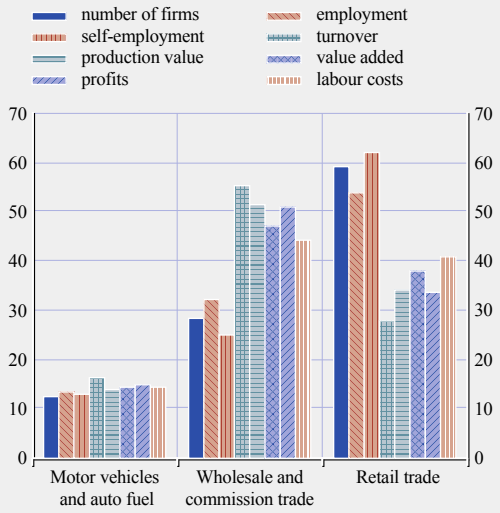
The *profit share* (the share of profits in value added) is lowest in the retail sub-sector and highest in the wholesale sub-sector (see Chart 3a).[12] *Profit margins,* once adjusted for the implicit labour income of the self-employed, are broadly similar across the distributive trades, at around 4% to 5%, but are only around half the size of margins in the non-financial business sector (see Chart 3b). However, as will be discussed

11 PPP-adjusted value added in the distributive trades sector per capita is broadly similar across countries but varies substantially in respect of industry.

12 Note that the profit share shown in Chart 3a has been adjusted for the imputed labour income of the self-employed. The reason for this adjustment is to increase comparability across countries and sectors. For the purposes of this report, the adjustment was made in two stages, with average compensation per employee first being adjusted downwards by the average amount accounted for by social security contributions (20%) and then further adjusted by an additional 20% – or 36% in total – to account for average differences in skill levels, etc. See Gollin (2002) for a more detailed discussion of this issue.

Chart 2 Share of sub-sectors in the distributive trades sector in 2006

(percentages)



Sources: Eurostat SBS database and Eurosystem staff calculations.

later in Section 1.3, comparisons of profit margins across sectors should be made and interpreted with caution.[13] The fact that the distributive trades sector provides intermediation services, often involving a very high turnover rate for goods, means that low profit margins do not necessarily imply low profitability, for example if measured in terms of return on capital.

Overall, and notwithstanding the differences highlighted above, the breakdown and features of the main sub-sectors are broadly similar across euro area countries. Wholesale trade is most important in terms of value added and turnover, but retail trade is more significant in terms of employment, number of firms and, above all, interaction with consumers. The next section examines the retail trade sub-sector in more detail.

1.1.2 A CLOSER LOOK AT THE GROCERY TRADE

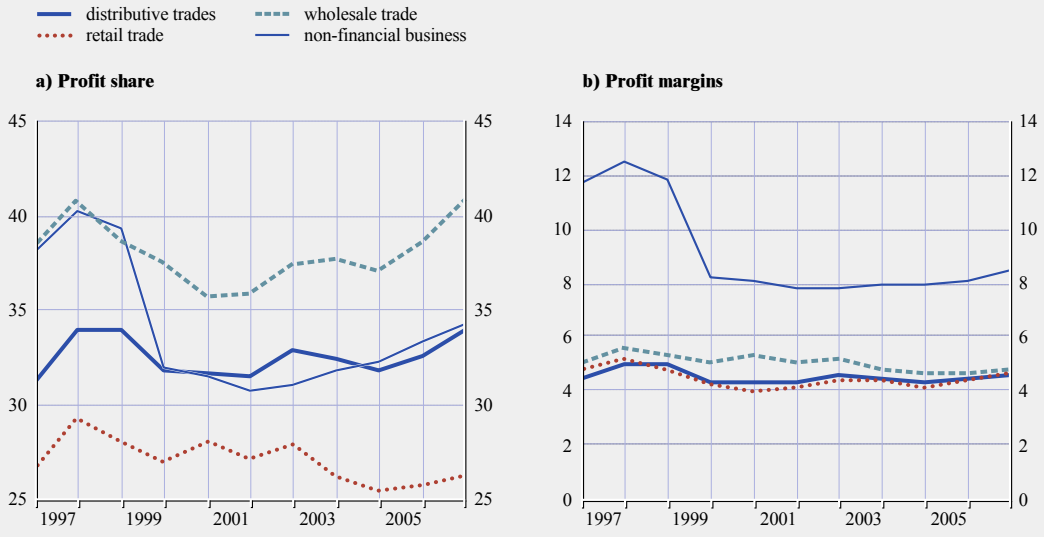
Retail trade is divided roughly evenly into grocery trade (primarily food and certain household items) and non-grocery trade (clothing and footwear, household furnishings and electronic goods). These two parts of the

13 Aside from the issue of imputing the labour income of the self-employed, the calculation and interpretation of profitability measures is quite complex. See ECB (2004) for a more detailed discussion.

Chart 3 Comparison across distributive trades sub-sectors

(average profit share (adjusted) in euro area distributive trades sectors; percentages)

(average profit margin (turnover; adjusted) in euro area distributive trades sectors; percentages)



Sources: Eurostat SBS database and Eurosystem staff calculations.

sub-sector differ substantially in terms of their main economic characteristics, with grocery trade being somewhat more homogeneous than non-grocery trade. This section considers the grocery trade in more detail.

Most consumers obtain the basic necessities required for daily living, such as food and household goods, in the grocery market. However, although the goods sold here may be broadly similar across countries, there are notable differences across countries in terms of, for example, store format, the degree of internationalisation, market penetration by hard discounters and private label brands, and the role of buying groups.

These differences are clearly visible in the summary statistics presented in Table A1. The total number of grocery stores in the euro area is approximately 850,000, the majority of which, unsurprisingly, are located in the larger economies. However, it is striking that both Italy and Spain feature more stores than Germany and France, despite having smaller populations. This may be due, in part, to differing definitions and thresholds for classifying stores. When it comes to selling space, measured in square metres – which is perhaps a more meaningful indicator – Germany (with almost 40 million m²) and France (with almost 30 million m²) account for the largest proportion of the total euro area grocery selling space of 150 million m². This inverse correlation between number of stores and selling space captures an important distinction in the European grocery trade. Southern European countries, such as Greece, Cyprus, Italy, Portugal, Spain and Malta, tend to have more traditional and smaller grocery retailers than certain northern European countries, for example Finland, Germany, France and Austria. In terms of real sales per store, Finland and France have the highest on average, but in the case of Finland this is mainly because the stores are generally of a large size – a feature of the grocery trade in both these countries. On a square metre basis, the countries with the highest real sales per store are Ireland, France, the Netherlands and Belgium.

It should be borne in mind that these statistics are somewhat crude, being country averages only; they do not account for heterogeneity across stores or regions. Furthermore, when trying to interpret the different indicators, it is also necessary to consider geographical and economic differences between countries (such as population density and distribution and income levels), as well as socio-cultural and regulatory factors.

Chart 4 presents the distribution of grocery sales by store format across countries; this varies considerably, reflecting a combination of factors, such as historical legacies, societal preferences, socio-geographical factors and regulatory conditions.[14]

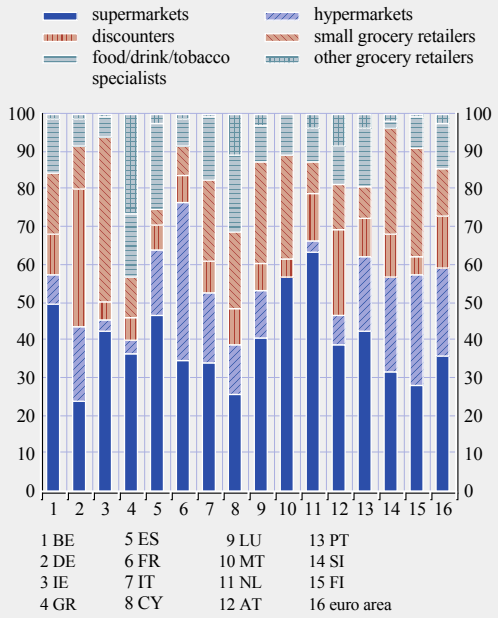
On average, supermarkets accounted for just over 33% of grocery sales in the euro area in 2009. However, at the country level, their market share was lowest in Germany (at around 25%), where hard discounters dominate grocery sales, and in Cyprus, where smaller, traditional retailers account for a relatively large proportion of sales. The market share of supermarkets was relatively high in the Netherlands and Malta, where hypermarkets account for a relatively small proportion of grocery sales. While a small market size may explain this in the case of Malta, this is clearly not so for the Netherlands, where planning restrictions are behind the absence of hypermarkets.[15] On average, hypermarkets accounted for approximately 25% of grocery sales in the euro area. Their market share was highest in France, the "home" of the

14 The definition of store formats is to some extent arbitrary. In general, the store size (in terms of square metres) and range (in terms of the number and breadth of goods stocked) are the criteria used. Hypermarkets tend to have a sales area above 2,500 m²; supermarkets one between 1,000 m² and 2,500 m²; and discounters a sales area of between 400 m² and 1,000 m², with a relatively limited range of goods.

15 In its Economic Surveys of the Netherlands, the OECD has noted that "planning restrictions in the Netherlands have inhibited the entry and expansion of large-format operators, which has impeded productivity growth in the sector. While Dutch planning and zoning restrictions have been successful in protecting small and specialist retailers located in town centres, they also may distort competition and offer considerable incumbency advantages to established retailers, thus creating and maintaining rents".

Chart 4 Distribution of grocery sales by store format

(2009)



Sources: Euromonitor (2011) and Eurosystem staff calculations.

hypermarket, at over 40%, but also relatively high in Finland and Slovenia. Hard discounters – discussed in more detail below – accounted for nearly 14% of euro area grocery sales, but this figure was much higher for countries such as Germany and Austria. More traditional retail formats, for example small grocers and specialist retailers, account for a relatively large proportion of retail sales in Ireland, Greece and Cyprus.

In terms of their evolution over the past decade, the market shares of supermarkets and hypermarkets have remained broadly unchanged – although this conceals the fact that they have risen in some countries where they were previously relatively low, but fallen in others where they have been negatively impacted by hard discounters (as in the case of Germany and Austria). Overall, the market share of discounters has risen, while that of smaller grocers and specialist retailers for food, drink and tobacco has fallen. However, a more recent phenomenon is not captured in the chart, namely the growth of "superettes"[16].

Retail trade, especially in larger countries, is dominated by domestic companies. For example, in Germany, all of the top eight grocery companies are German-controlled. Similarly, the six leading companies in France are all under French control. However, in Italy and Spain, foreign companies have broken into the ranks of the market leaders. More generally, there has been an ongoing trend of internationalisation, particularly in smaller economies and eastern European countries (see Box 5 on the distributive trades sector in the new Member States).

THE EVOLUTION OF DISCOUNTERS

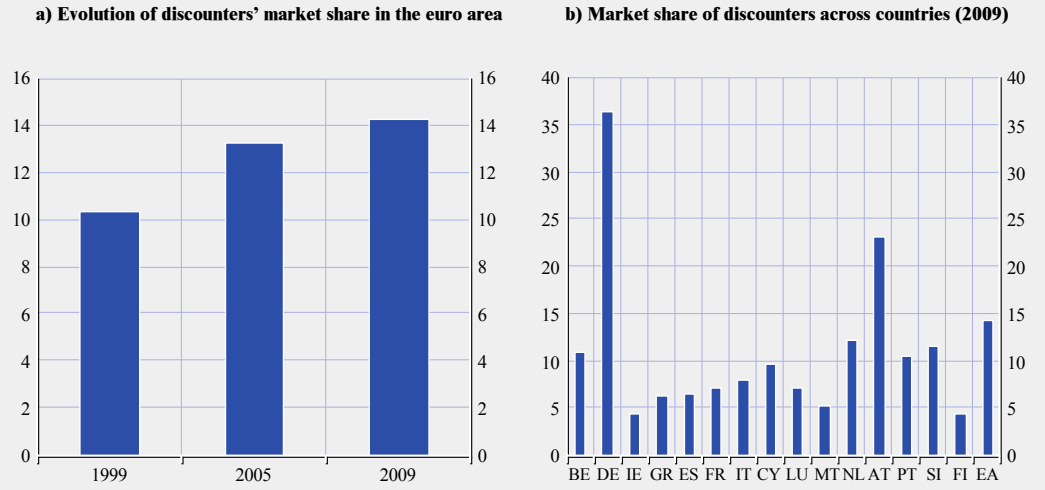
A key development in modern grocery retailing is the emergence of discounters. This term generally refers to retailers that offer a relatively limited number of products (frequently own-brand or unbranded) in a relatively small sales area, keep costs to a minimum and focus on price competition.[17] Chart 5a shows that the hard discounters' share of the grocery retail market grew from around 10% in 1999 to almost 15% in 2009. However, this pattern varies substantially across countries. For example, the market share of discounters in Germany and Austria is above 20%, whereas in most other countries (except for Belgium, Cyprus, the Netherlands, Portugal and Slovenia) it is around 5% (see Chart 5b).

16 These are compact modern convenience stores. A number of leading retailers with supermarket and hypermarket chains have started to expand into this market with a view to extending their coverage of the grocery market.

17 Frequently, discounters offer fewer than 1,000 stock-keeping units (SKUs), which compares with the 20,000 plus SKUs of a typical large supermarket. Discounters also have a relatively small sales area of around 1,000 m² on average, which is much smaller than that of a typical supermarket (1,000 m² to 2,500 m²) or a hypermarket (above 2,500 m²) but larger than that of a convenience store, which usually relies on much less than 500 m². In addition, to keep costs to a minimum, discounters use basic display and merchandising and offer minimal additional services. Meanwhile, "hard discounters" are characterised by the fact that they predominantly offer goods that are low-priced, own-label and dry, while "soft discounters" carry more brands and fresh food products.

Chart 5 Discount retailers

(discounters' share in percentages)



Sources: Euromonitor and Eurosystem staff calculations.
Note: "EA" refers to the euro area.

Given that discounters tend to have lower prices (although any comparison of prices is made difficult by the lack of comparable brands), this increase in market share over time and heterogeneity across countries may have implications for price levels and inflation, both in terms of measurement issues (see the box entitled "Implications of developments in the retail trade structure for inflation measurement") and in terms of explaining country differences. In addition to their possible impact on average price levels, given the relatively small store size, in some countries discounters have found it easier to open new stores than supermarkets – a fact which may have implications for the evolution of competition over time and across countries.[18]

However, gauging the implications of this growth in discounters for the overall level of competition in the grocery market is somewhat complicated. Although discounters and other grocery retailers undoubtedly compete in the same overall market (grocery retailing), they may not always compete in the same market segment or for the same customer group. McKinsey and Company (2005) argue that discounters only serve 20% of the consumer market (i.e. "shoppers who care about price above all else").[19] The more recent development that many "conventional" retail chains are now starting their own discount banner further supports the argument that discounters and conventional supermarkets may not always be competing directly in the very same market.

18 McKinsey and Company (2005) argue that "discounters are growing largely because regulation allows them to open more quickly and easily than their non-discount rivals" (i.e. owing to their limited product range and smaller average store size). However, this has not been the case in Spain, where, up until 2010, a special licence was required in most regions for discount stores and large retail outlets.

19 In this regard, Cleeren et al. (2010) use an empirical entry model to study competition between grocery discounters and traditional supermarkets in Germany. They find evidence for competition both within and between the supermarket and discount formats. However, these effects may be complex and require careful interpretation. For instance, they find that the entry of the first two discounters has no significant effect on the performance of supermarkets in a given area.

Box 1

ONLINE RETAIL TRADE AND THE DEGREE OF CROSS-BORDER RETAIL COMMERCE

Online retail trade is often regarded as the epitome of a "perfect" market and associated with improved possibilities for market participants to compare prices [1] (increased transparency) and with a dramatic decrease in the importance of geographical proximity for consumption expenditure. The evolution of online retail trade should contribute to lower prices, less (local) pricing power on the part of individual market participants and increased competition. In addition, sellers would have a better chance of reaching more customers, which would allow for economies of scale. Consumers would have access to a wider range of products, as their product choice would not be limited to the supply of goods available in local sellers' stores. From a monetary policy perspective, the evolution of online retail trade is interesting for two main reasons: the potential for lower and regionally (but also internationally) less divergent prices for equal or comparable products and the possibility of more flexible prices (i.e. more frequent price changes).[2]

The e-commerce market of the EU has grown considerably compared with that of other economies. In 2006, it was estimated to have reached a value of €106 billion, which was roughly comparable to its US counterpart. Around 60% of internet users in the EU shopped online in 2010, though figures vary strongly across countries.[3] In particular markets, such as airline travel, the emergence of online trade has completely altered the traditional operating models, for example airline companies selling their services via travel agents. Today, some EU low-cost carriers basically only sell their services online. The internet is also the fastest growing retail channel. In 2008, only direct retail sales (used by 79% of retailers) were more common than sales via e-commerce (used by 51% of retailers), and e-commerce was significantly more popular than mail order trade (30%). Although online trade is growing rapidly, it still accounts for just a small proportion of overall retail trade (see Chart A(a) and Chart A(b)), with some notable exceptions across markets and countries (see Chart A(c) and Chart A(d)). The markets with the highest penetration of online trade are electronics and appliances (12%), leisure and personal goods (10%) and clothing and footwear.[4] Penetration remains relatively low in the health and beauty, house and garden and grocery markets. Meanwhile, the ratio of online to store-based retail sales is highest in Germany, Finland, France and the Netherlands, but relatively low in Spain, Italy, Cyprus, Malta and Portugal.

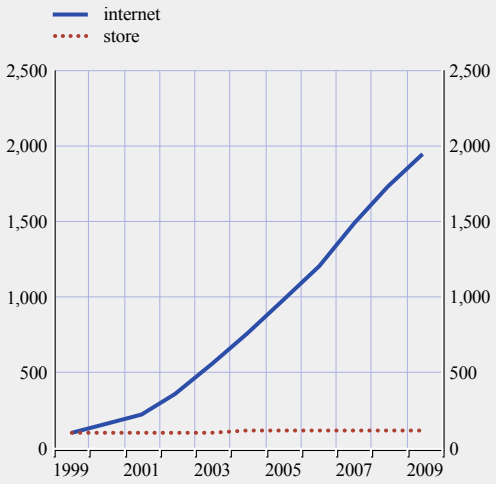
One noticeable fact is *the widening discrepancy between domestic and cross-border e-commerce.* From 2006 to 2008, the share of all EU consumers purchasing at least one item over the internet rose from 27% to 33%. Meanwhile, cross-border e-commerce remains much less important

1 According to the European Commission, the internet has become a convenient alternative to "window shopping" and is shaping the way that consumers approach their purchasing activity: three out of five Europeans with internet access at home compare prices online before making a purchase, either online or in a physical store.
2 However, Lünnemann and Wintr (2011) have found that internet prices are not necessarily more flexible than those of traditional "brick and mortar" stores. Instead, there is substantial heterogeneity in the frequency of price changes across shop types and product categories.
3 In Romania, for example, only 9% of internet users were found to shop online, while the corresponding figure for the United Kingdom was much higher, at 79%. Meanwhile, 69% of the EU population is comprised of "internet users", with 60% being "regular internet users" (see Eurostat (2010)).
4 According to Nielsen (2010), internet sales are particularly popular in specific product categories, such as books, clothing and footwear, electronics and music.

Chart A Different perspectives on internet retailing

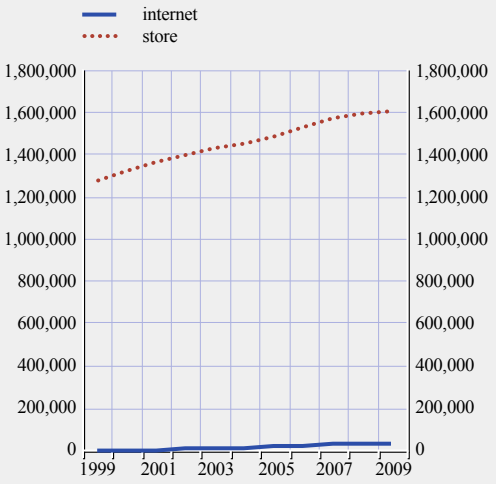
(1999 = 100)

a) Evolution of store-based and internet retail sales



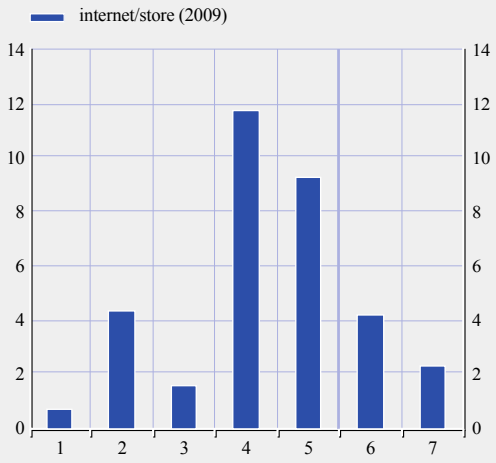
(EUR millions)

b) Evolution of store-based and internet retail sales



(percentages)

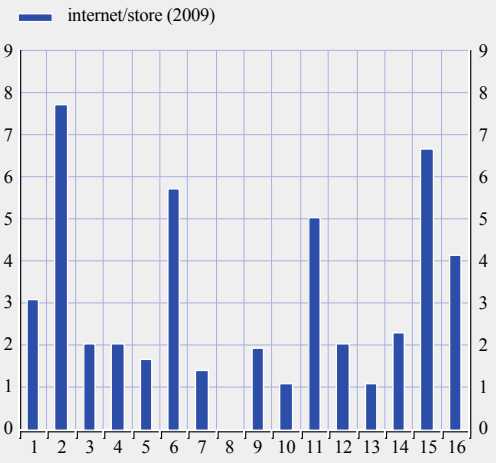
c) Ratio of internet to store-based retail sales by sector



1 Health and beauty
2 Clothing and footwear
3 Home and garden
4 Eletronics and appliances
5 Leisure and personal
6 All (excl. grocery)
7 All (incl. grocery)

(percentages)

d) Ratio of internet to store-based retail sales by country



1 BE
2 DE
3 IE
4 GR
5 ES
6 FR
7 IT
8 CY
8 LU
9 MT
10 NL
11 AT
12 PT
13 SI
14 FI
15 Euro area

Sources: Euromonitor and Eurosystem staff calculations.

(increasing over the same period from 6% to 7%), and only a very small proportion of e-commerce transactions within the EU are conducted across national borders (around 2% to 4%).[5]

Barriers to cross-border e-commerce: The scope for cross-border e-commerce appears to be enormous, yet, in practice, consumers often end up being tied to their country of origin.

5 Source: Public Policy Exchange (see http://publicpolicyexchange.co.uk/events/BB22-PPE2.php).

Frequently, they are either redirected to national sites or refused a sale. In an EU-wide test of online shops, it was possible in only 39% of cases to place an order with an online shop that was not located in the same country as the buyer. The remaining 61% of orders failed either because traders refused to serve the consumer's country or for other reasons (technical problems or because a particular payment option was not available). Language barriers may also have been an issue here, but their importance is not easy to quantify.

Regulatory barriers contribute to significant market fragmentation at the EU level. Consumer law, electronic waste regulations and postal systems are affected by regulatory fragmentation. Complex value added tax (VAT) requirements for traders selling across borders make it difficult for smaller brands and retailers to do business across the EU. These restrictions are directly hindering the growth and competitiveness of small and medium-sized enterprises now active in this sector or aspiring to be so in the future.

Thus, barriers to cross-border trading appear to be the biggest obstacle to the growth of e-commerce in the EU. Nevertheless, the potential for more cross-border online shopping and, hence, for increased competition, lower prices and greater price flexibility seems to be there. In 2008, one-third of EU citizens indicated that they would consider buying goods or services from another Member State online if these were cheaper or better. In addition, in more than half of all Member States, at least 50% of the products tested were found to be at least 10% cheaper in a foreign internet shop (shipping costs included). Furthermore, it was generally the case that half of the tested products could not be found in any domestic internet shop.

Cross-border shopping could play a significant role in the development of the Single Market. The potential effect of an improved regulatory environment – with sufficient trust between market participants – on cross-border online trade can also be seen from examples of particularly intense "traditional" cross-border retail shopping, e.g. between the Republic of Ireland and Northern Ireland and within the "Grande Région" encompassing Luxembourg and the surrounding regions of Belgium, Germany and France.[6]

There are several drivers of cross-border retail shopping. Of course, price differentials (owing to matters of taxation (e.g. VAT), exchange rates, and perhaps also factors such as differences in labour costs, living standards, and in the rent levels or pricing practices of wholesalers) play a role. Differences in the range of available products or simply (additional) transport costs close to zero (e.g. if people cross the border anyway as they work in the neighbouring country or in the case of particular geographical proximity) are further drivers.[7] Cross-border retail trade can increase competition and thus contribute to reducing price level differences across countries and regions (Section 2.1 discusses the fact that prices appear to vary more across borders/countries than within borders/countries). The potential impact on price levels and divergence between prices obviously depends on the determinants of this divergence. While cross-border shopping

6 In Luxembourg, 9.5% of consumption expenditure by resident households took place outside national borders in 2009 (rising from 5.4% in 2002). Consumption by non-resident households reached 22% of total private consumption in the country. Thus, cross-border shopping can clearly be a bi-directional phenomenon. Some goods are cheaper in Luxembourg, while others can be purchased for less abroad. For instance, at its normal rate of 15%, VAT is lower in Luxembourg than in the surrounding countries, but some sellers complain about not having the possibility of importing goods from the most competitive foreign supplier and about being forced to make imports via Belgium – some of the producers here have assigned a certain "territorial exclusivity" regarding Luxembourg to Belgian intermediaries, which leads to additional costs. In addition, some goods produced for the German market, for example, cannot be offered by domestic firms, as these goods are not traded by the Belgian intermediary and are only offered by German intermediaries.

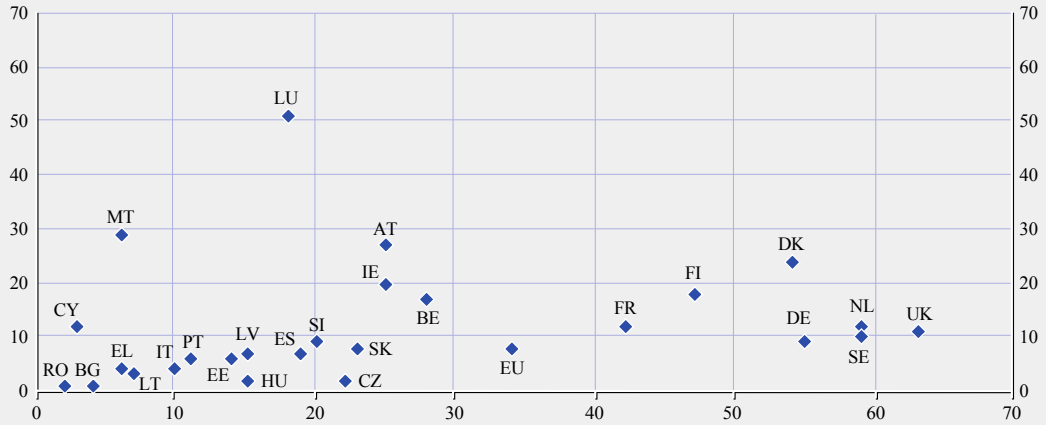
7 See European Commission (2003), p. 8.

Chart B Domestic versus cross-border online shopping

Domestic and cross-border internet purchases

(percentage of population that has made at least one online purchase (2009); percentages)

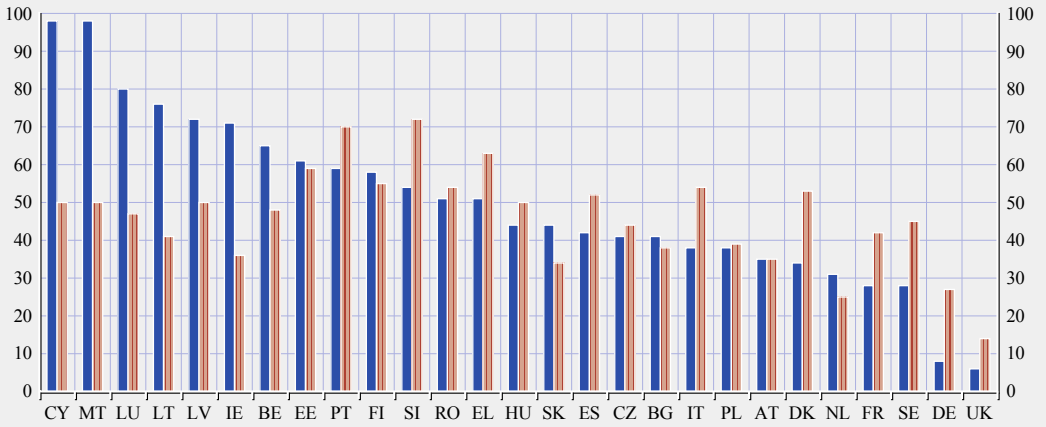
x-axis: from domestic sellers
y-axis: from sellers in other EU countries



Domestic availability and international price differentials of products sold online

(results of test purchases with respect to availability in domestic online shops and price differentials between domestic and cross-border online shops; percentage of total product searches)

internet product searches where only cross-border offers were found
internet product searches where the best cross-border offer was at least 10% cheaper than the best domestic offer



Source: European Commission.

can be expected to prompt a decrease in existing price differentials, this is less so if differences are predominantly due to tax differentials, especially where taxes are set in conjunction with price controls. In such cases, cross-border shopping will contribute less to bringing the market closer to equilibrium.

In conclusion, it can be seen that both domestic e-commerce and cross-border retail shopping can be of considerable importance if several conditions are fulfilled; assuming a significant initial

divergence in prices and availability (across sellers or countries), the most important conditions are acceptable transaction costs and limited barriers to trade, whether implicit or explicit. These conditions have not yet been sufficiently fulfilled for cross-border e-commerce in Europe. While e-commerce in the EU as a whole is of a comparable magnitude to that of the United States, it remains heavily segmented and constrained by borders, not so much because of a lack of interest on the part of consumers or retailers but because of a number of barriers. A simplification or harmonisation of legal dispositions in a number of fields (for example, as related to VAT regimes, the reuse of electronic waste, the management of copyright levies, payment systems and logistics) and an improvement in consumer protection could free up a market that has significant potential for contributing to increased competition, lower prices and less price divergence across the EU. It would then become an important cornerstone for the further development of the Single Market.

THE DEVELOPMENT OF PRIVATE LABELS

Partially in response to, but also as a result of, the emergence of discounters, another key development in retailing over the last two decades, particularly in the grocery trade, has been the emergence of "private label" (or "own-label") brands.[20] These are brands developed and owned (although not necessarily produced) by the retailers themselves.[21] Chart 6a shows that the market share of private label goods has been increasing steadily in the euro area since 2001 (data are only available from this point onwards). However, this has not occurred at the expense of larger brands, which have broadly maintained or even slightly increased their market share. Rather, it is smaller brands as well as artisanal products, such as those produced by traditional bakeries, that have seen their market shares decline.[22]

The penetration of private label goods in the market for packaged food is, at around 20% to 25%, higher in western Europe than in any other geographical region, including the United States (where it stands at slightly above 15%).[23] A major factor that has facilitated the emergence of private label brands is the consolidation that has taken place in the retail sector and the growing scale of retail operations. Thus, a number of retailers, in many cases ones operating internationally, have achieved sufficient scale economies to launch and develop their own labels. Chart 6b shows that the market share of private label goods in this industry varies substantially across countries in the euro area. Countries where private label brands have a market penetration that is above average (i.e. a market share of between 30% and 35%) include Germany, the Netherlands and Belgium. In Spain, France, Portugal, Austria and Slovenia, the market penetration is at average levels (i.e. private label brands have a market share of between 15% and 25%), while in Greece, Italy,

20 These are also sometimes referred to as "non-branded" goods. However, strictly speaking, this is incorrect, as many own-label goods are acknowledged as being brands in their own right.

21 In general, goods which are relatively generic or "commoditised" are more likely to be offered as private label goods (e.g. canned and packaged food products, tissues and kitchen towels, etc.), while goods which have a higher degree of product differentiation and/or for which advertising or quality is of great importance (e.g. cosmetics, alcoholic drinks, baby food) tend to exhibit a lower level of private label penetration. J. Steenkamp et al. (2004) report that private label brand penetration is highest for certain categories of food and beverage and household care products, but lower for many personal care products.

22 This pattern is consistent with submissions made to the UK Competition Commission Groceries Market Inquiry, which suggested that "secondary and tertiary brands may be more vulnerable" than brand leaders to the evolution of the private label concept (see UK Competition Commission (2007)).

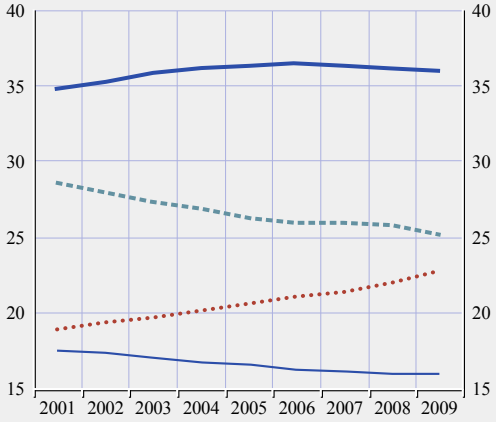
23 The differing degree of penetration of private label products can possibly be explained by a mix of socio-cultural structural-economic factors, including in respect of regulation. For a detailed analysis, see J. Steenkamp et al. (2004). This publication reports that in countries where consumers have low trust in firms and institutions (e.g. owing to unreliable standards), private label penetration is likely to be low. Penetration tends to be higher where economic development is higher, such as in western Europe, North America and Australasia, but other factors, such as structural ones (e.g. high retail concentration and high market penetration by discounters), also play a role.

Chart 6 Different perspectives on private label brands

(market share in percentages)

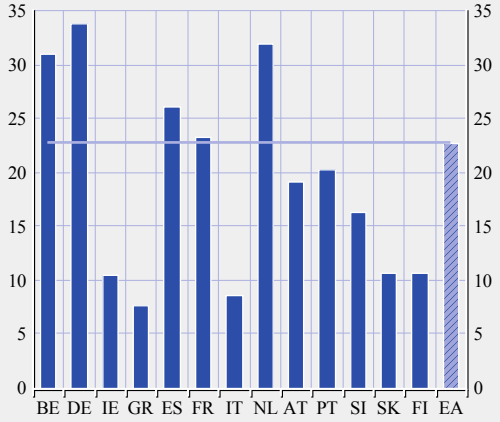
larger brands
private label
miscellaneous brands
artisanal

a) Evolution of brands



(percentages; 2009)

b) Share of private label brands in the packaged food market across countries



Sources: Euromonitor and Eurosystem staff calculations.
Note: "Larger brands" refers to those brands for which separate market shares are reported by Euromonitor; "miscellaneous brands" refers to those not subject to separate reporting by Euromonitor (i.e. because their market share is either too small or regional); "EA" refers to the euro area.

Ireland, Slovakia and Finland, it is below average (i.e. the market share stands at around 10%). Most of these latter countries are characterised by a low level of concentration and a relatively high degree of traditional format channels, such as small grocery retailers and independent retailers.

Lastly, while the net competition and welfare-related effects of private label goods may be unclear a priori, an increase in the market penetration of private label goods is likely to exert downward pressure on price levels, as such goods are generally cheaper (other things being equal).[24] There can be large differences in terms of the price premium commanded by manufacturer brands.[25]

24 The existence of private label goods may also offer consumers more choice and may counteract the bargaining power of the producers of large brands. On the other hand, a high penetration of private label goods might give retailers too much market power, particularly if competition in the retail sector itself is insufficiently high. In addition, smaller brands might get squeezed out of the market by a combination of large branded and large private label goods. Thus, while a higher penetration of private label goods may reduce the pricing power enjoyed by the producers of branded goods, the overall effect on competition is not so straightforward owing to the complex interaction between the upstream (producer) and downstream (retailer) parts of the consumer goods chain. (For a detailed analysis of the impact of private labels on the competitiveness of the European food supply chain, see European Commission (2011).)

25 J. Steenkamp et al. (2004) found that "aggregated across all FMCG (fast moving consumer goods) categories, manufacturer brands are priced higher than private labels in all regions, but the price premium varies between 31% in Central/Eastern Europe to 119% in China". There are also large differences in the average global price premium commanded by manufacturer brands with regard to the three broad categories of food and beverages (54%), household care (over 49%) and personal care (over 96%).

Box 2

IMPLICATIONS OF DEVELOPMENTS IN THE RETAIL TRADE STRUCTURE FOR INFLATION MEASUREMENT

This box explains how structural developments in retail trade are treated in the Harmonised Index of Consumer Prices (HICP) and discusses the potential implications for inflation measurement, drawing on the empirical evidence of previous studies. As outlined in Section 1.1, a number of key structural changes have taken place over recent decades. Among these, three points in particular pose challenges for consumer price indices, namely the trend away from:

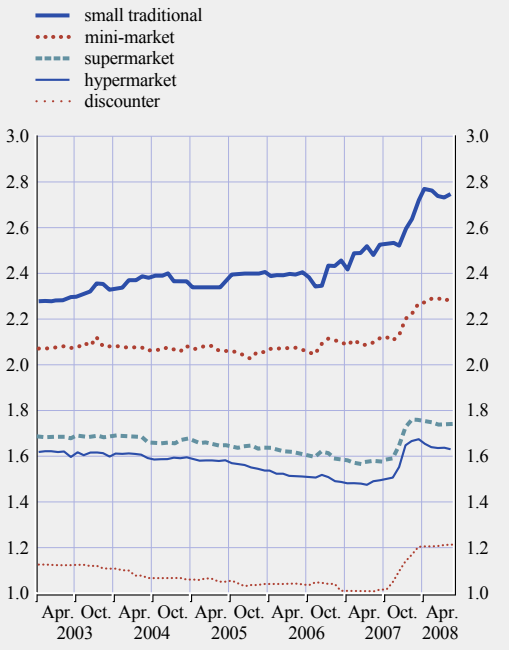
(1) traditional outlets towards larger chain stores, franchises and discounters;
(2) stores towards non-store retailing (i.e. the internet), especially for certain product groups;
(3) branded goods towards private label products.

This box will focus on the first two issues, but, conceptually, all three issues are closely related: in each case, one product offer is replaced by an alternative, often at a much lower price level.

Evidence of price level differences across outlet types

Chart A gives an example of average price level differences for Camembert across different types of retail outlet in France. While the pattern of the price of Camembert moves in a similar manner over time, there are large differences in the price levels observed. A number of studies for the US and European markets have shown that such price level differences are common, especially between discounters and traditional store types. Based on US data, Leibtag et al. (2010) compare identical items at the Universal Product Code level, and show an expenditure-weighted average price discount of 7.5%, with prices being between 3% and 28% lower in non-traditional stores than in traditional stores. In Europe, Nielsen (2007) reports that prices in the largest two discount groups were 30% and 40% lower than the average across a range of categories. However, these differences can vary substantially, depending on product type.[1]

Chart A Average price of Camembert in different outlet types in France



Source: INSEE.

1 The reported gaps were smaller in Germany, at 18% and 30% respectively – this may reflect either more competitive prices or a different stocking strategy in this country; for example, one large German discounter also sells branded goods. Interestingly, this report argues that a higher level of discount does not necessarily guarantee a larger market share, as it notes that the market shares of discounters are relatively low for personal care goods – categories where price differentials were found to be high. Consequently, it concludes that other factors, such as "variations in product quality, pricing strategies and emotional pay-offs appear to be at play".

Structural changes over time in the variety of retail outlets and their respective market shares can pose two distinct challenges for inflation measurement:

- First, such changes can mean that, after some time, the sample of outlets used for compiling the consumer price index (CPI) is no longer representative. Measurement errors may then occur because price changes in the outlets excluded from the sample may differ from those taking place in outlets covered by the sample or because movements in the market shares of different outlet types result in the weights applied to different outlets becoming outdated. Such errors do not necessarily move in a particular direction.[2] One reason why sample weights may become outdated is that consumers may shift their purchases away from outlets which have relatively high price increases in favour of outlets which have relatively low price increases (outlet substitution effects). If such shifts are to be reflected in a price index, this effect would, under normal circumstances, lead to an upward bias in the index.[3]

- A second distinct issue is the method by which new outlets with a different average price level are introduced into the sample. How such price level differences should be reflected in the HICP depends, in principle, on the extent to which the lower prices are due to an inferior retail service on the part of the seller. In practice, statistical offices generally use a linking technique which attributes the whole of the price difference to differences in the quality of retail services – the new lower prices thus have no impact on the level of the index. The likelihood that this is an over-adjustment suggests an upward bias affecting not only the HICP, but almost all CPIs used around the world.

Treatment in the HICP

In constructing their HICPs, national statistical offices select a sample of products and outlets which aims to be representative of all transactions (and therefore all outlets) within the scope of the index. There is no specific regulation regarding the frequency of sample updates, but currently the eight euro area countries accounting for around 49% of the euro area HICP update their outlet samples annually or on a continuous basis, with most of the remaining countries conducting an update once every five years. Only four euro area countries have a wide coverage of internet retailers in their HICP samples for goods. In some cases, internet retailers are included, though only for a very limited number of products (e.g. personal computers and books).[4] With regard to substitution between outlets in the sample, the main statistical approach to tackling lower level substitution – the use of the geometric mean at the lower levels of index compilation – is employed by the majority of euro area countries,

2 Linz (2009) reports on the introduction of a new explicit weighting system in the German CPI which gave a much higher weight to discounters than that used previously. Since this change occurred during a period marked by strong increases in food commodity prices, for many food product price changes (as distinct from price levels) were substantially higher for discounters than for other retailers (for an analysis regarding the pass-through of food commodity prices and the retail structure, see Section 2.4.2). This led to upward revisions of the German CPI in 2008. The proper representation of different outlet types in the index thus has important consequences for index dynamics, since pass-through may be expected to be more pronounced for low-cost outlet types, where material inputs account for a larger share of the final price.

3 The HICP measures the ratio of expenditure necessary to maintain a certain fixed consumption pattern and thus it is often assumed that such shifts in expenditure patterns are not relevant. Nevertheless, these consumption patterns do not refer to specific products in specific outlets, but rather to "consumption segments" which serve a common purpose (see Article 1 of Commission Regulation (EC) No 1334/2007). This would suggest that the HICP should reflect lower level substitution, i.e. substitution within a single consumption segment to the extent that consumers may chose between different product offers (which may be in different outlet types) in order to fulfil the same underlying objective ("purpose of consumption").

4 As regards services, many countries include air tickets, hotels, tickets for cultural events, etc., but these are beyond the scope of this report.

Overview of sampling practices in national HICPs

	BE	DE	EE	IE	GR	ES	FR	IT	CY	LU	MT	NL	AT	PT	SI	SK	FI
Use of geometric mean	No [1]	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No [1]	Yes	Yes	Yes	No	Yes
Comprehensive update of outlet sample on annual basis	No	No	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes	No
Internet retailing (goods)	No [2]	Yes	No	No	No	No [3]	No [4]	No [2]	No	No	No	Yes	Yes	No	No [2]	No	Yes
Weight in euro area HICP	3.3	25.9	0.1	1.3	3.8	12.7	20.7	18.5	0.3	0.3	0.1	4.8	3.2	2.2	0.4	0.7	1.7

Source: Eurostat.
1) The geometric mean is used in a limited number of cases.
2) Excluding personal computers and some household appliances.
3) Excluding personal computers and books.
4) Excluding mail order.

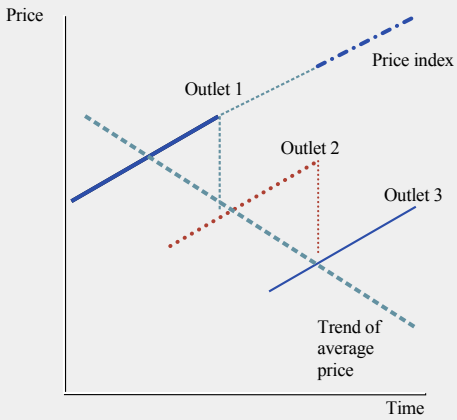
with a combined weight of nearly 65%. The table gives an overview of the sampling practices implemented across countries.

When an outlet goes out of business or is no longer representative, it is replaced by an alternative outlet via a linking procedure. Chart B gives a highly stylised example of how linking is used to replace high-priced outlets with lower-priced outlets. Here, all three outlets show the same price development over time, but with different average price levels. When Outlet 1 is replaced by Outlet 2, the price developments of the two outlets are linked – since the price development of the replacement outlet is positive, the resulting price index increases (see the dotted line). The difference in price levels between the two outlets is not reflected in the index, and the price index even shows an opposite development compared with the trend for the average price level.

Implications for inflation measurement

Whether or not this approach is appropriate depends on the value that consumers attach to the difference in the quality of the retail services (or the "retail experience") provided by the two stores. For example, the store may be in a less convenient location, have less convenient opening hours, offer a less personal service than a traditional retailer, have a less favourable before and after-sales service (or returns policy), or a more limited choice of products. If the replacement outlet is an internet retailer, the retail experience is quite different – the consumer is not able to examine the product before purchasing it, delivery comes with a delay and may also be more expensive than the cost of visiting a shop in person. Of course, there are also a number of benefits to internet retailing, notably lower search costs, no queues and fewer constraints regarding retail opening times.

Chart B Stylised example of linking across outlets



Source: Adapted from Greenlees and McClelland (2008).

The assumption inherent in linking is that the price level differences at the time of linking equal the consumer evaluation of how these differences are reflected in the quality of retail services, i.e. that the market is efficient and in equilibrium, with fully informed consumers. In reality, there have been clear trends in the market shares of certain types of outlet

and relatively consistent price differential patterns across outlet types. The increasing market shares of lower-priced discounters and internet retailers suggest that, even after accounting for differences in the retail services offered, many consumers consider these prices to be of better value, and the practice of linking therefore imparts an upward bias to the HICP inflation rate. Such a bias is, however, reduced to the extent that the competitor outlets remaining in the sample either reduce their prices in response to the new outlet or lower the quality of their own retail service (to the extent that this is not adjusted for in the HICP). Equally, the bias would be exacerbated if competitors increased the quality of their retail service in order to differentiate themselves. It should be noted that since price differences are not constant across all products, linking also implies an inconsistent valuation of the quality of the retail service embodied in each product price.

Empirical evidence regarding the impact of new outlet bias on inflation measurement

Most of the empirical evidence for the size of the new outlet bias is based on US data and relates to the US CPI.[5] Evidence for euro area countries is scarcer and generally refers to the late 1990s. Lequiller (1997) considers the new outlet bias to be relevant in the case of the French CPI. Drawing on a previous study which suggested a bias of 0.2 percentage point per annum in the 1980s, and adjusting this figure in the light of more recent market developments, Lequiller proposed a range of 0.05 percentage point to 0.15 percentage point per annum. With regard to the German CPI, Hoffmann (1998) calculated unlinked indices for 11 relatively homogeneous food products taken from household budget surveys and compared the results to the corresponding German CPI sub-indices. Over a ten-year period, the deviations for different products ranged from 0.2 percentage point to 1.7 percentage points per annum. These were attributed partly to the linking practices of new lower-priced outlets and partly to an unrepresentative outlet sample (which has since been significantly improved).[6] Extrapolating these results to the overall German CPI led to an estimate "unlikely to exceed 0.1 p.p. annually". Finally, Covas and Silva (1999) used Portuguese micro data to conclude that during a period of rapid change in the Portuguese grocery sector in the early 1990s, the new outlet bias reached 0.5 percentage point per annum. This then decreased to 0.25 percentage point per annum by the end of the 1990s. No quantitative studies on bias in the euro area HICP have been conducted to date, largely as a result of the considerable data requirements involved and the fact that index construction practices at the detailed level are still quite heterogeneous across euro area countries.

Alternative approaches to dealing with changes in the retail structure

In general, the regular updating of HICP outlet samples seems to be appropriate, although in countries conducting an update only once every five years or less, there is a danger that samples become unrepresentative as a result of structural changes. The limited coverage of internet retailing in many national HICPs is a symptom of this problem. Regarding the new outlet bias, a satisfactory approach would require an explicit evaluation of various facets of retail services in a similar way to how quality

5 Reinsdorf (1993) found an upward bias of 0.25 percentage point per year in the US CPI for food at home and petrol. Lebow, Roberts and Stockton (1994) extrapolated these results to come to an estimate for the overall US CPI of 0.1 percentage point per year. More recently, Hausman and Leibtag (2004) have modelled the direct impact of the growth of discounters in the US market and the indirect effects of price competition in respect of the more traditional retailers, estimating a bias of 0.32 percentage point to 0.42 percentage point in the food component of the US CPI. Furthermore, Greenlees and McClelland (2008) make use of six years of micro data for 14 food categories and implement hedonic regression techniques in order to take account of differences in product characteristics. Although their results confirm the potential significance of the new outlet bias, they find that some offsetting effects, for example the fact that the larger package sizes sold by certain types of discounter are valued less by consumers, partly explain the lower per unit prices.

6 See Linz (2008).

adjustments for product characteristics are approached. Hedonic approaches which regress price information on a range of characteristics of retail services may be one avenue that warrants further research. Alternatively, consumer surveys could be conducted in order to obtain direct evaluations of different aspects of retail services. While both approaches appear to be resource-intensive, it should perhaps be noted that structural changes in the retail trade sector are relatively gradual and innovations are much less frequent or varied than those in respect of product characteristics. Therefore, such research and valuations would need to be estimated relatively infrequently, but could nonetheless be applied to the HICP (which is calculated on a monthly basis).

Although evidence from the 1990s suggests that new outlet bias was not a source of significant bias, recent developments in the market shares of discounters and online retailers and the growth of private label brands suggest that the challenges these structural developments pose for inflation measurement should remain a concern for policy-makers and are worthy of further research.

THE ROLE OF BUYING GROUPS

Another key feature of the grocery sector (and other distributive trades sub-sectors[26]) – one not often known outside the consumer goods producing and distributive trades sectors – is the role of buying groups. A buying group is an organisation of retailers that combines the buying power of its members in order to be able to purchase goods at a more advantageous rate than might be achieved through individual negotiation. Buying groups are important because, by combining the buying power of their individual members, they can achieve very large economies of scale and potentially alter the balance of power in negotiations between retailers and suppliers.[27] Their existence also implies that measures of competition based on company-level data may overstate the true level of competition and understate the bargaining power of buying groups relative to suppliers.[28] For example, the largest buying group in Europe is comprised of more than ten national supermarket chains operating across 19 countries, with a combined turnover of approximately €120 billion. To put this into perspective, the largest European retailer, which is also the second largest retailer in the world, has a total global turnover of around €90 billion.

The net impact of buying groups on competition and social welfare is not straightforward. On the one hand, proponents would argue that buying groups help national retail chains compete with large multinational producers and pass on cost savings to consumers. Furthermore, they may enable smaller manufacturers to access a larger market and provide them with opportunities for producing private brands that can then be distributed across Europe.[29] On the other hand, it could be argued that their massive scale provides them with too much bargaining power, especially in relation to smaller producers and smaller retailers.[30] Dobson (1999) argues that although the net effects are uncertain a priori, the anti-competitive effects are likely to be limited.

26 Buying groups exist in most other industries, for example in consumer electronics and in consumer recreation.

27 Balan (2007) cites the major factors behind the emergence of buying groups as: (a) the increased power of manufacturers; and (b) the need to compete with hard discounters. With regard to the former, she notes that "in France, the first eight global industrial groups in the agro-food sector have a market capitalization higher than the largest retailer and that the degree of concentration is very high in some food industries".

28 It should be noted that buying groups are usually structured in such a way as to avoid competing members. Thus, for international buying groups, in general, no two members come from the same country and spheres of operation tend not to overlap too much.

29 Dobson (1999) cites three possible pro-competitive effects resulting from the presence of buying groups. First, they may facilitate the Single Market, as the sharing of buying price information is likely to increase pressure on suppliers to reduce inter-state price discrimination and enable new branded products to be introduced more quickly across a number of Member States. He argues that other forms of sharing retailer know-how within alliances may speed up the process of implementing best practice (e.g. as regards distribution and IT systems) and have positive effects on productivity. Second, they may provide countervailing market power to large suppliers. Lastly, they may result in the more efficient development of private label products.

30 On the other hand, Dobson (1999) also indicates potential anti-competitive effects: (1) monopsony (i.e. monopoly buying) power; (2) opportunistic buyer behaviour that works against suppliers who have incurred sunk costs; (3) distortions in retail competition; and (4) mutual forbearance between members.

Box 3

FIRM DEMOGRAPHICS, FIRM SIZE AND PERFORMANCE ANALYSIS

This box considers the demographic features – from firm "births" (creation of new firms) to firm "deaths" (firms ceasing to exist) – of companies in the distributive trades sector in terms of size, and assesses the contribution of these elements to growth developments. Understanding firm dynamics may provide some insight into the reasons behind the relatively poor productivity performance of the distributive trades in the euro area.[1]

Demographic analysis

According to information from the Eurostat SBS database related to firm demographics, between 1998 and 2006 (the last year for which data are available) in the euro area as a whole, about 2.6 million enterprises were "born" in the distributive trades sector and 2.2 million "died", or ceased to exist, implying a net increase of about 400,000 firms.[2] In comparison, in 2006, there were approximately 4.5 million enterprises in the sector. Since 2003, the difference between the birth rate and the death rate (the net turnover rate) has been constantly positive in the euro area, albeit with marked differences across countries.[3] Most (around 98%) of births and deaths take place within the small firm categories (which feature firms with up to four employees), while very few larger firms enter the market. Nevertheless, the latter have a higher probability of surviving.

Most euro area countries have experienced a decrease in the number of small firms and an increase in the number of larger ones, i.e. a consolidation process. This trend was most evident in those countries where micro firms are predominant (Italy, Portugal and Spain). The aforementioned consolidation process can be explained by either *within class effects* (small firms having a negative net turnover rate and/or large firms having a positive net turnover rate) or *between class effects* (there are more small firms becoming large than there are large firms becoming small).[4] The data reported in the table allow an understanding of how these two effects contributed to the consolidation process between 1998 and 2006.[5] In Italy, for example, both these effects were at work: in particular, the smallest firms were characterised by both a negative net turnover rate and an outflow of existing firms towards upper categories. In Portugal and Spain, the between class

1 It has been argued (e.g. in ECB (2011) and Bartelsman and Doms (2000)) that the shedding of less productive firms and the entry of more productive ones ("creative destruction") is a process that is an important driver of productivity, especially total factor productivity growth.

2 Eurostat provides the number of active enterprises, the number of firm births and the number of firm deaths for the period from 1998 to 2007. According to the metadata, active firms are those ones whose value added is strictly positive, whereas firms are said to have ceased to exist when they have not been active for at least two years. Employment class data are also available, but follow an aggregation criterion which differs from the one adopted in the general SBS database: zero (the entrepreneur alone); one to four workers; five to nine workers; and above ten workers. Survival rates, plus the number of persons employed, are available for the non-zero classes.

3 The distributive trades sector was more dynamic than average in Spain and France, where the net turnover rate was positive throughout the whole sample (1998 to 2006), averaging 1.6 and 1.4 respectively. Finland and the Netherlands also recorded a positive turnover rate. By contrast, the number of firm deaths exceeded the number of firm births in Italy, mainly owing to the strong contraction experienced in the retail trade market here. Data for Germany are only available for 2005 and 2006 (thus a direct comparison with other countries is inappropriate): the net turnover rate was close to zero in 2005 and slightly negative in 2006.

4 The *between class effect* is calculated as the difference between growth rates and turnover rates. For instance, it is generally observed that the first class is characterised by a positive turnover rate and a negative growth rate, implying migration towards upper classes.

5 The time series is not complete for all countries: the data for France are available from 1999, and those for Austria and Germany from 2004, while only the last two years are available for Belgium and Ireland.

Demographic statistics

(1998 to 2006)

	Distributive trades (euro area)				
	Growth	Birth rate	Death rate	Net turnover	Reallocation
Zero	-1.4	9.4	8.3	1.1	-2.5
One to four	-0.8	4.3	4.5	-0.2	-0.7
Five to nine	1.1	1.9	1.8	0.2	0.9
Ten or more	1.4	1.1	1.2	-0.1	1.5
Total	0.1	7.9	7.2	0.8	-0.7

Sources: Eurostat (SBS business demographic statistics) and Eurosystem staff calculations.
Notes: Data for Belgium, France and Ireland relate to the year 2007, as 2006 data were not available, while for all the other countries 2006 is the last available year. "Zero" denotes businesses where the only employee is the entrepreneur himself (or herself). Net turnover is calculated as births minus deaths, while reallocation is measured as growth minus net turnover.

effect prevailed among micro firms.[6] It should be noted, however, that focusing on net turnover rates and concentration ignores the debate on "creative destruction". The market entry of new firms is often associated with innovative ideas, while the market exit of firms is attributed, inter alia, to obsolete business plans. Thus, gross turnover rates may also be of importance in terms of consumer welfare.

Overall, the demographics of the euro area distributive trades sector suggest that this sector is still highly fragmented: micro and small firms are highly prevalent. However, it is slowly moving towards consolidation and the number of larger firms has increased somewhat recently.

Performance analysis

Moving from demographic indicators to performance measures, such as turnover, value added and productivity,[7] it can be seen that firms belonging to the upper employment categories always show higher productivity values than those in the lower employment categories: both unit turnover (i.e. turnover per person employed) and value added increase with firm size in all countries, sub-sectors and years. For instance, for the euro area distributive trades sector in 2007, the average unit turnover for firms employing more than 20 workers was more than one and a half times the corresponding figure for firms employing 1 to 19 workers. Although the share of value generated by small firms is still considerably high all over continental Europe, it has nonetheless been decreasing since 1999, reflecting a gradual reallocation towards larger enterprises.

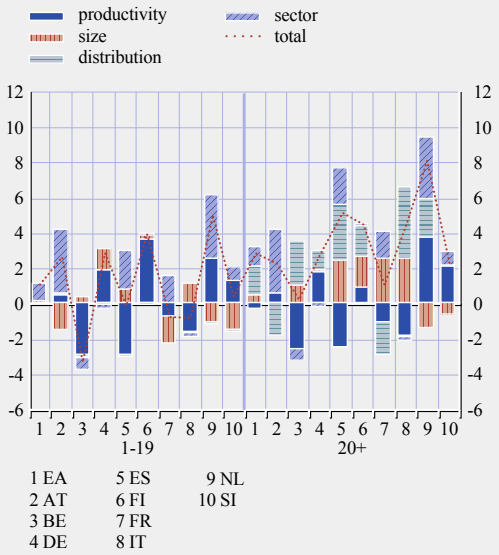
In order to clarify what are the most relevant determinants of turnover growth in the distributive trades sector, a *shift and share* analysis is conducted, which allows the total turnover variation ($\Delta T t$)[8] to be broken down into four components. These factors measure the contribution to total growth owing to:

1. the productivity change *(productivity effect)*;
2. the average firm size variation *(size effect)*;
3. the variation in the share of total firms by employment class *(distribution effect)*;
4. the variation in the total number of enterprises *(sector effect)*.

6 The difference between these two countries is that in Spain (as in Italy) the reallocation effect is beneficial for all of the upper classes, while in Portugal it only supports two particular classes (firms employing between one and four workers and those with between five and nine workers), so firms there remain small.
7 Note that all monetary indicators (turnover, value added and gross operating surplus) are expressed in real terms, deflated using the price indices for gross output and value added from the EU KLEMS database.
8 For computational details, see the mathematical derivation in the Appendix.

Decomposition of grocery sector turnover growth

(1999 to 2007)



Sources: Eurostat SBS database and Eurosystem staff calculations.
Note: Labour productivity is defined as real turnover per person employed (in thousands of euro), deflated using the price indices for gross output from the EU KLEMS database.

In the chart, a shift and share decomposition using the 1 to 19 and 20+ employment categories is shown for ten euro area countries.[9] Considering the euro area aggregate, sector effects contribute positively to both size categories. However, the other effects (productivity, size and distribution) are negligible for smaller firms (1 to 19 workers), but positive for larger firms. Looking across countries, while the combined effect for smaller firms was negative for Belgium, France and Italy, for larger firms (20 workers and above), it was positive for all countries.

All in all, the performance analysis suggests that the distributive trades sector in the euro area is traditionally characterised by many small low-performance firms and a few larger high-performance firms that contribute the most to turnover growth. Nevertheless, the modernisation process that has been taking place since the mid-1990s has served as a stimulus for small firms trying to survive, to increase their size (and even migrate to upper employment categories) and to become more productive (as in the case of certain firms in Finland and the Netherlands).

9 The analysis is based on information from the SBS database and covers the period from 1999 to 2007 for the distributive trades sector. Greece, Ireland and Slovakia are not included as the data for these countries are incomplete. Precise country figures are provided in the Appendix.

1.1.3 LABOUR MARKET AND PRODUCTIVITY

Since the launch of Economic and Monetary Union (EMU) in 1999, there has been considerable growth in employment within the distributive trades sector, with an additional 1.8 million jobs being created across the euro area – over a million in retailing alone – by 2009. The distributive trades thus accounted for roughly one in seven of the almost 15 million new jobs generated in the euro area over this period. In several countries, the sector's contribution to overall employment growth has been even greater, particularly in Slovakia, Portugal and Greece, and, until recently, in Ireland, the Netherlands and Spain.[31]

In terms of labour market characteristics, the distributive trades sector differs from the rest of the economy in a number of important ways (see Table 1). The sector as a whole, and retailing in particular, is characterised by a higher than average share of the *self-employed, part-time workers and women*. Indeed, the retail trade sub-sector now accounts for roughly one in every eight women with employment in the euro area. Furthermore, it is a big employer of *younger workers*, accounting for just over 40% of total euro area employment for the under 25s. This partly explains why the sector has a *lower than average proportion of high-skilled*

31 According to national accounts data, between 1999 and the onset of the recession in the respective countries, the distributive trades accounted for: roughly one out of every six new jobs created in Ireland, the Netherlands and Spain; between one-third to one-half of net employment creation in Greece; and the equivalent of around 220% of all net new employment for Slovakia since 1999.

Table 1 Employment in the distributive trades sector

(percentages)

	Whole economy	Distributive trades	Retail trade
By employment status [1]			
Employed	85.2	79.3	76.2
Self-employed	14.8	20.7	23.8
By gender [2]			
Male	55.1	51.6	38.0
Female	44.9	48.4	62.0
By working time [2]			
Full-time	80.0	77.7	70.0
Part-time	20.0	22.3	30.0
By age [2]			
Young (15-24)	9.2	13.2	15.2
Prime age (25-54)	76.9	74.9	73.0
Older (>55)	13.9	12.0	11.8
By skill level [2]			
Unskilled/semi-skilled	27.2	30.5	31.7
Skilled	44.9	53.0	53.7
Highly skilled	27.9	16.5	14.6

Sources: Eurostat and Eurosystem staff calculations.
1) National accounts data.
2) Data from Eurostat's European Union Labour Force Survey; percentages expressed in relation to total employment in the relevant groups, covering all of those between 15 and 99 years of age.

workers than other sectors of the economy. In terms of remuneration, the distributive trades tend to be characterised by *low pay* – particularly in retailing – and even in relation to low-skilled work in other sectors. In terms of wage-bargaining, while the sector is typically characterised by *low levels of union membership*, collective wage agreements tend to cover a majority of retail employees in many euro area countries. Meanwhile, *minimum wages* – at either a national or sectoral level – act as an effective wage floor in other countries.[32]

Cross-country differences can be large (see Chart A2 in the Appendix for further details). For example, self-employment is considerably higher in Greece and Italy; part-time work is significantly more common in the Netherlands; and men outnumber women in the retail trade in Malta. Part of this cross-country variation simply reflects national differences in business structure, demographics or education systems.[33] But it may also partly reflect differences in administrative regulations (e.g. minimum qualifications or capital requirements) which limit start-ups and thus potentially hinder a rich and innovative source of competition.

Relatively low productivity in the distributive trades sector is often highlighted as a major factor behind the widening aggregate productivity gap between the euro area and the United States. Productivity growth is particularly low in euro area retail trade (see the box entitled "Productivity in the euro area and US distributive trades"). Productivity differences may also have implications for price level and inflation differentials across countries, since for a given level of wage growth, higher productivity helps limit unit labour cost growth, thereby containing inflation and price levels.

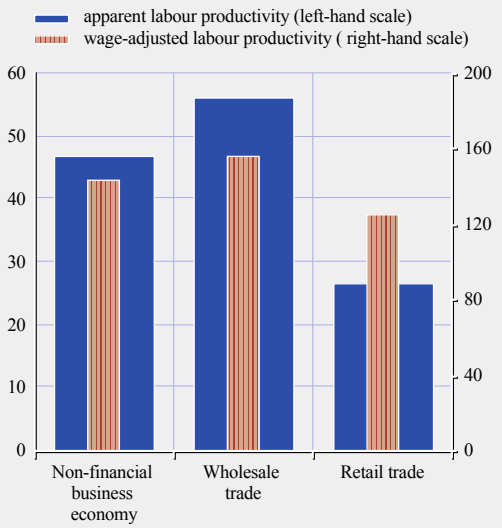
Since the mid-1990s, productivity in the euro area distributive trades sector has averaged around three-quarters the level for the economy as a whole – measured in terms of (real) value added per person employed. Undoubtedly, the lower average capital intensities in the sector[34] help explain this, but it may also be partly a result of the difficulties in measuring labour input in a sector characterised by high proportions of part-time labour and self-employment.[35]

Chart 7 shows how productivity estimates for the distributive trades sector are affected when adjustments are made for self-employment and part-time labour, i.e. by comparing "raw" estimates of "apparent" labour productivity (measured in terms of gross value added per person employed) with "wage-adjusted" productivity (which expresses apparent labour productivity in relation to personnel costs and adjusts for differences in the proportion

32 Eurofound (2009).
33 See, for example, Jarvis and Prais (1989) and Mason et al. (2007).
34 See, for example, O'Mahony and van Ark (2003).
35 In a sector characterised by a high degree of self-employment and family-owned concerns, labour input may be particularly difficult to measure. This is because of the highly flexible nature of the "casual labour" supplied by family members and the general tendency for the self-employed to under-report actual working hours.

Chart 7 Productivity in euro area distributive trades in 2006

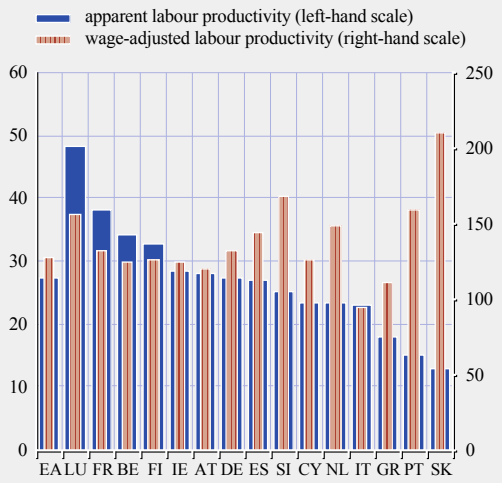
(EUR thousands; ratio)



Sources: Eurostat SBS database and Eurosystem staff calculations.
Note: "Apparent labour productivity" is defined as gross value added per person employed (in thousands of euro), adjusted for cross-country price level differences using Eurostat PPPs for consumption goods; wage-adjusted labour productivity is computed as labour productivity divided by personnel costs (compensation per employee) adjusted for the proportion of employees in total employment.

Chart 8 Retail productivity across the euro area in 2006

(EUR thousands; ratio)



Sources: Eurostat SBS database and Eurosystem staff calculations.
Note: "Apparent labour productivity" is defined as gross value added per person employed (in thousands of euro), adjusted for cross-country price level differences using Eurostat PPPs for consumption goods; wage-adjusted labour productivity is computed as labour productivity divided by personnel costs (compensation per employee) adjusted for the proportion of employees in total employment; "EA" refers to the euro area.

of self-employed workers).[36] Wage-adjusted productivity rises in all three sectors when proper account is taken of the cost of labour input, with this increase being proportionately larger in retail trade, reflecting both the higher incidence of part-time employment here *and* the low average wages of the sub-sector.[37] Nevertheless, the relative performance of the sub-sectors remains unchanged, with productivity being substantially lower in retailing than in wholesaling.

A similar picture also emerges at the country level (see Chart 8), but with divergent productivity levels across the Member States. No "big country" effects arise to support the notion that euro area productivity performance is simply a matter of economies of scale and scope. While part of the cross-country variation can be explained by differences in the structure of retailing and differing average capital intensities, it is likely that this is also partially due to variations in the composition of respective retail workforces.[38]

36 For consistency with the statistics included earlier in this report, these data on productivity and wage-adjusted productivity are taken from Eurostat's SBS database and adjusted for cross-country differences in price levels using Eurostat's PPP conversion for consumer goods. Similar results – in terms of country ranking – were also obtained using national accounts sources. Aside from the issue of input measurement, the academic literature has long been cautious regarding *output* measurement in services. For the sake of brevity, these issues are not elaborated here; more details can be found in Dean and Kunze (1992), Oi (1992) and Triplett and Bosworth (2001).

37 Estimates for the retail sub-sector rise from around 57% of the non-financial business economy (NFBE) average found for "apparent productivity" to almost 87% of the NFBE average when wage-adjusted productivity ratios are considered. Meanwhile, in the wholesale sub-sector, the combination of a lower share of part-time employment *and* higher average wages actually reduces the sub-sector's productivity advantage from 120% to 108% of the NFBE average.

38 See, for example, Dolado and Stucchi (2008). They have spearheaded a growing body of research which suggests that part-time workers, along with the increasing number of people on temporary contracts, have less access to the career and productivity-enhancing training typically enjoyed by their full-time peers.

Box 4

PRODUCTIVITY IN THE EURO AREA AND US DISTRIBUTIVE TRADES SECTORS

The sharp divergence in productivity growth between the euro area and United States since the mid-1990s has long been a major concern for policy-makers. More recently, a number of researchers have suggested that much of the widening differential between the two economies can be traced to poor productivity growth in the services industries in the euro area.[1] This box uses the EU KLEMS database for a comparative examination of developments in the euro area and the United States related to productivity.[2]

The distributive trades: a low productivity sector?

Following nearly two decades of comparable growth, euro area aggregate productivity growth has slowed progressively since the mid-1990s, averaging only 1.3% per year between 1995 and 2007, compared with the roughly 2.0% per year for the United States (see table). As a result, aggregate euro area productivity decreased from roughly 90% of the US level to around 83% by 2007.[3] More than a third of the widening productivity gap was attributable to the distributive trades.

While rates of productivity growth in the distributive trades sector declined in both economies between 1995 and 2007, the differential remained large – standing at 1.6 percentage points by the mid-2000s. In the retail sub-sector, the differential was even greater – at 2.2 percentage points – that is, roughly three times the whole-economy average. This can largely be explained by the much stronger growth in value added in the United States over this period.[4] As a consequence, euro area retail productivity decreased from around 95% of the US level in 1995 to 71% by 2007.

Productivity growth

(average annual percentage change; percentage points)

(a) Gross value added per hour worked: **whole economy**

	Euro area	United States	Differential
1995-2001	1.4	2.0	0.6
2001-2007	1.2	1.9	0.8

(b) Gross value added per hour worked: **distributive trades**

	Euro area	United States	Differential
1995-2001	2.0	6.1	4.1
2001-2007	1.0	2.6	1.6

(c) Gross value added per hour worked: **retail trade**

	Euro area	United States	Differential
1995-2001	1.5	4.1	2.7
2001-2007	0.3	2.5	2.2

Sources: EU KLEMS database (2009) and calculations by ESCB staff.
Note: The euro area aggregate refers to the euro 12.

Sources of productivity growth

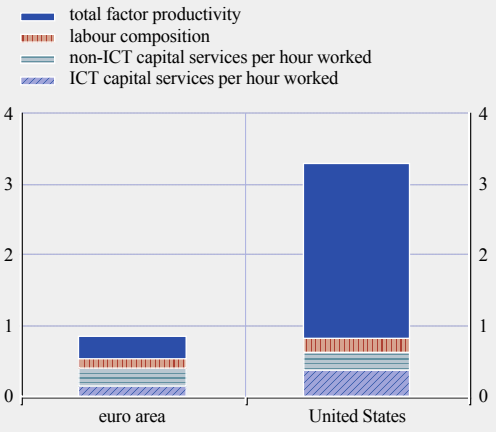
One argument commonly used to explain the notable US productivity advantage – both at the aggregate level and at the level of the distributive trades sector in particular – contends that much of the productivity gap can be explained by the United States having better exploited new ICT than European economies. Certainly, as any shopper knows, ICT has had

1 ECB (2006) and Van Ark et al. (2005).
2 Productivity is defined as real gross value added per hour worked, derived from the double-deflation method of subtracting the weighted growth of intermediate input from the growth of output (both at constant prices) using national supply and use tables. The euro area aggregate in the EU KLEMS database covers the 12 countries which have been members since 2001.
3 Productivity levels are derived using purchasing power parities for 1997. They are calculated on the basis of the expenditure and production approach described in Inklaar and Timmer (2008).
4 Between 1995 and 2007, real value added in the retail sub-sector increased by around 62% in the United States, compared with only 18% in the euro area. Over the same period, total hours worked grew by 9.6% in the United States, compared with 5.6% in the euro area.

a pervasive impact on the retail sector in recent decades: there are the obvious "point-of-sale" innovations (such as bar codes, cash registers providing for electronic funds transfer and smart card technologies) as well as important efficiency gains in respect of "back office" functions (owing to the possibility for more careful supply chain and inventory management and the collation of more precise information about customers' purchasing patterns).

Contributions to retail productivity growth in the euro area and the United States, 1995 to 2007

(average annual percentage change)



Sources: EU KLEMS database (2009) and calculations by ESCB staff.
Note: The euro area aggregate refers to the euro 12.

The chart shows the contributions to retail productivity growth made by the factor inputs of labour, ICT capital services and non-ICT capital services. That part of productivity growth which cannot be attributed to these factors, but which stems from broader intangible structural differences and technological or organisational changes, is captured in the residual component, which is commonly referred to as "total factor productivity" (TFP). The chart shows that expenditure on ICT capital services (the solid bars) was somewhat higher in the United States than in the euro area during the period from 1995 to 2007. Moreover, some of the full impact of ICT capital may also be embodied in the remaining factors, since ICT investment is often a catalyst for broad-based restructuring (including organisational changes and/or human capital investments) – for instance, part of the non-ICT investment may have gone into building new premises in order to benefit from greater economies of scale (or scope).

Even accepting a broad-based *complementarity* between the contributions from ICT investments and the other factors, it is unlikely that ICT and any related spillovers can adequately explain the substantially higher growth of TFP in US retailing. Thus, in recent years, an alternative point of view has gained ground, one which argues that intangible and structural factors may be more important in explaining the US productivity advantage since 1995. For example, it is often claimed that the euro area regulatory environment is more restrictive (and thus less competitive) for retailing than that of the United States: land zoning regulations constrain the size and density of larger format stores, restrict the number of stores of a certain type in a given location or impede cross-border expansion. Others contend that labour tends to be less flexible (and hence more costly) than in the United States because of regulations governing hiring practices, working times, overtime and ancillary payments, all of which make it more difficult for euro area retailers to exploit cyclical demand dynamics than for their US counterparts. Macroeconomic and "cultural" factors – namely a higher marginal propensity to consume and an earlier switch to higher value goods in the United States, and the preference for smaller "local" stores in the euro area plus language barriers which hinder economies of scale – are also likely to have played a role.

Concluding remarks

The sources of the productivity gap between the United States and euro area retail sub-sectors are many and varied. An earlier adaptation to technological change has undoubtedly been of importance,

but much more of the gap seems to be attributable to structural and organisational factors. Research on retailing in the United States suggests that the strong productivity growth seen there in the 1990s was led, to a great extent, by new market entrants displacing less efficient incumbent establishments.[5] Tackling restrictive regulations in the euro area distributive trades sector – so as to boost competition and enable euro area retailers to operate at the productivity levels implied by European "best practice" – would assist in the pursuit of higher long-run economic growth.[6]

5 L. Foster et al. (2002).
6 Analysts at the McKinsey Global Institute (2010) argue that if the EU15 were to achieve the productivity levels of the top-quartile food retailers, this could translate into a 21% increase in EU retail productivity, contributing alone to an additional 0.75 percentage point of EU value added.

1.1.4 COST STRUCTURE – THE ROLE OF PRODUCT AND CHANNEL

This section considers the cost structure of companies in different segments of the euro area distributive trades sector during the period 1999 to 2007.[39] Determining and understanding cost structures within the distributive trades sector is of crucial importance for a number of reasons. Most notably, the cost structure is an important determinant of price-setting in the sector. An analysis of the cost structure of retailers may possibly help us understand differences in the rate of cost pass-through across markets and segments. In addition, the cost structure has been linked to price stickiness.[40] Lastly, the presence of different cost structures across countries for given segments may be indicative of differing degrees of competition.

This analysis of cost structures distinguishes between three broad cost elements, namely: (i) the cost of goods sold (COGS); (ii) non-labour operating costs; and (iii) labour costs – all of which are expressed as a proportion of net turnover. Non-labour operating costs include upstream distribution costs and margins as well as downstream distribution costs (such as shop fittings, property and IT equipment). The difference between net turnover and these three cost elements represents the firm operating margin. The cost structure of firms can vary considerably – even for firms within the same segment or of a similar size – because of, for example, variations in property costs. In the *retail* trade, these variations may have a key impact on pass-through to consumer prices.

The COGS represents the single biggest cost incurred by firms engaged in the distributive

39 Unless otherwise stated, the source of the data used in this section is the Eurostat SBS database.
40 Álvarez et al. (2005b), Álvarez and Hernando (2005) and Sabbatini et al. (2005) document that differences in the cost structure across sectors help explain differences in the degree of price flexibility.

Table 2 Cost structures within the distributive trades sector

(percentages)

	Distributive trades	Wholesale trade	Retail trade	Retail grocery	Retail non-grocery
Turnover/sales (excluding taxes)	100.0	100.0	100.0	100.0	100.0
Cost of goods sold	72.0	73.6	66.7	74.6	62.0
Gross margin	28.0	26.4	33.3	25.4	38.0
Other costs	14.4	14.7	14.8	11.1	17.0
Value added	13.5	11.7	18.5	14.3	21.0
Labour costs – unadjusted [1]	7.8	6.2	11.6	9.7	12.7
- Wages and salaries	6.1	4.8	9.0	7.6	9.9
- Social security contributions	1.7	1.4	2.5	2.1	2.8
Profits – unadjusted [1]	5.8	5.4	6.9	4.6	8.2

Sources: Eurostat SBS database and Eurosystem staff calculations.
1) Not adjusted for the implicit labour income of the self-employed.

trades, albeit with some variation in its share of turnover being evident across the individual sub-sectors (see Table 2). Within retailing, a further difference is to be found between the grocery trade, which covers the sale of non-specialised food, beverages and tobacco products, and other retail trades. The 75% COGS share for grocery retailing is substantially higher than that for most other retail markets, which varies between 55.5% for textiles and 62.6% for DIY (hardware, paints and glass) – see Table A4 and Table A5 in the Appendix. The electronics and appliances market is a notable exception: here, the COGS accounts for around 72% of sales. The higher COGS share for grocery and electronics and appliances retailing most likely reflects the more internationalised, efficient and concentrated nature of these retail markets (see Section 1.3 on concentration and competition), which helps to drive down costs, including unit labour costs.

Value added accounts for 13.5% of total turnover for the distributive trades. Of the main sub-sectors, retail trade has the highest ratio of value added to total turnover, at 18.5%, and within the retail sub-sector itself this ratio is highest for the clothing trade, at 23.6%. In line with the labour-intensive nature of activity within the distributive trades sector, value added is largely attributed to *labour costs* (58%). The magnitude of the labour cost component differs somewhat across the various distributive trades; for example, it amounts to 9.7% for grocery retailing and to 12.7% for non-grocery retailing.

Some variation in *profit margins* across the distributive trades sector is also evident. Profit margins are highest in the retail sub-sector, at 6.9%. However, this is partly due to the higher degree of self-employment in this sub-sector and its impact on unadjusted profit margins – see Section 1.3 for a more detailed discussion of profit margins. Within the retail sub-sector, the specialised food, beverages and tobacco trade has the highest retail margin, at 10.3%. This is followed by the pharmacy trade, which delivers a margin of 9.2%. Conversely, profit margin levels in the grocery trade were lower, at 4.6%. It should be noted, however, that an analysis of the profitability of the grocery market solely on the basis of profit margins can prove somewhat misleading, as it is necessary to take into consideration the typically high turnover (per unit of capital employed) involved. Hence, in this case, the rate of return on capital may provide a more realistic picture of profitability. Table A6 and Table A7 in the Appendix present a breakdown of the cost structure for, respectively, grocery retailing and non-grocery retailing in euro area countries. Furthermore, it should be noted that the analysis of the cost structure presented in this section refers to average figures for all firms, irrespective of size. A study of the operating cost profiles of retail operations in Ireland suggests that operating costs can vary considerably with firm size.[41]

1.2 REGULATION IN THE DISTRIBUTIVE TRADES SECTOR

This section considers the regulatory features of the distributive trades sector. A large number of areas of activity are subject to specific regulations in this sector, covering issues as diverse as planning permission, the setting-up of establishments, contractual relationships with suppliers, price controls and conditions for promotions and sales. While there is clear evidence of an easing in the degree of product market regulation across almost all countries, there remains scope for further progress.

Although some regulation is required to ensure the smooth functioning of markets, too much of it can generate numerous obstacles that hinder competition and overly favour incumbents.

41 According to Forfás (2008), labour and property costs represented the two largest costs, regardless of the size of the retail outlet, albeit with considerable variation in terms of the proportion of operating costs absorbed. In the case of labour costs, the variance ranged from 32% for retail parks to a high of 60% for multiples. Another cost differing sharply across retail formats was property costs, which varied from 16% for multiple retailers to 32% for the convenience store format. Variability in transportation and distribution costs was also quite pronounced, with such costs being largest for retail parks.

In the distributive trades sector, there are large areas of activity that are subject to specific regulations (especially in the retail sub-sector), with notable cross-country differences, in some cases even between regions and municipalities in the same country. Regulation covers issues as diverse as the setting-up of establishments, contractual relationships with suppliers, use of inputs, opening hours, price controls, promotions, sales conditions, the after-sales service, and waste and recycling. Even differences for certain products and types of establishment can be found. This extensive and complex regulation has some effect on the market structure, on the types of shop present and, ultimately, on the degree of competition. Moreover, this sector may also be affected by regulation applying to other sectors, such as general planning rules, rental contracts, environmental and sanitary regulations, transport regulations, labour regulations or consumer rights.

Planning rules, in particular, are often found to play an important role in creating barriers to entry or expansion and therefore in constraining competition, i.e. by impeding the emergence of competitors – especially large ones – able to challenge existing retailers.[42] General planning provisions, building permits and a specific requirement for prior authorisation to establish retail outlets are to be found in the majority of euro area countries.[43] In this respect, the European Commission (2010) has pointed out that currently fragmented national, regional and local commercial planning frameworks, in conjunction with different rules on property and land ownership, are factors likely to dissuade entrepreneurs and firms from entering certain markets.

Regulations may also have unintended consequences. For example, some commentators (see, for instance, McKinsey and Company (2005)) have argued that the strong growth in the market share of discounters is due to the fact that their business model (a small-sized store with a limited range of products) has allowed them to expand to those areas where size thresholds have prevented the opening of larger store formats, such as supermarkets and hypermarkets. See Section 1.1 for a more detailed discussion of discounters.

There are also regulations relating to the setting of prices or margins. In a number of countries, sales below cost have been banned in order to balance the relationship between small businesses and large retail chains, mainly in the groceries sector, but specific regulations differ.[44] Nevertheless, there is some evidence that this type of regulation eliminates or at least reduces intra-brand competition and results in price increases.[45] Other specific regulation is concerned with the contractual and operational relationships between retailers and suppliers.

It is, however, not easy to compare legislation between countries. To obtain an idea of the degree of regulation in each country, one possible approach would be to refer to summary indicators. These indicators aim to assign "scores" to the main aspects of certain pieces of legislation in force, making it easier to assess the more or less restrictive nature of the law concerned. The most frequently used indicators in this field are the product market regulation (PMR) indicators calculated by the OECD that allow the regulatory burden on the retail trade sub-sector to be measured.[46] These indicators, which cover areas such as shop opening hours, licences, regulations relating to large outlets and price controls, have

42 See, for example, the report on the Grocery Monitor Project of the Competition Authority of Ireland cited above: "We found that the retail planning system made it difficult for new retailers to enter the Irish grocery market and existing retailers to expand. This is because the planning system can influence the type of grocery retailers, where they locate, what they offer consumers and the prices that consumers pay". This report is available at http://www.tca.ie/EN/Promoting-Competitio/Market-Studies/Grocery-Monitor-Project.aspx

43 Prior authorisation to establish retail outlets is not required in the Netherlands, Slovenia and Slovakia.

44 It should be noted that this kind of regulation may have several purposes. In the economic literature, regulation that bans below-cost sales is considered to be primarily aimed at preventing anti-competitive and unfair commercial practices among competitors. However, health and public order considerations have led some governments to forbid the below-cost sale of alcohol.

45 See, for example, the study by Biscourp et al. (2008). This shows that the former "Loi Galland" (Galland Act), which banned sales below cost and non-discriminatory pricing, had these effects in France. Collins, Burt and Oustapassidis (2001) have found similar results for the Groceries Order in Ireland.

46 See Woelfl et al. (2009).

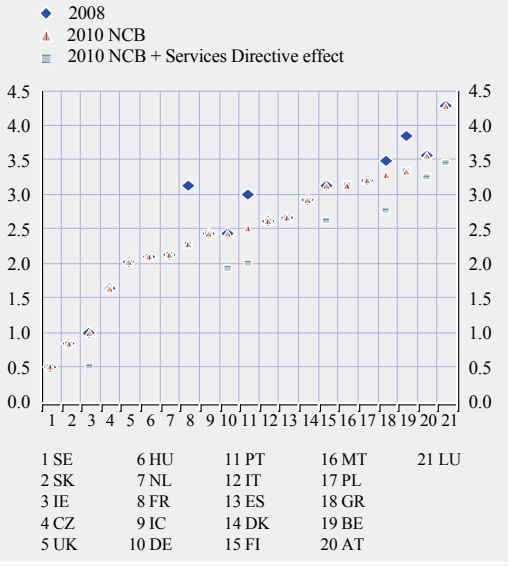
the advantage of being comparable internationally. The latest published results refer to the year 2008, but it has been possible to update these indicators for the year 2010 by using information provided by task force members from the participating Eurosystem national central banks (NCBs) – see Chart 9. The results of these indicators need to be interpreted carefully, especially when making comparisons at a more detailed level.[47] In addition, for some criteria, an indicator only takes into account state-level regulation, and this may not reflect possible regulatory differences at the regional level.[48]

It appears that there is an important divergence in the results for the different countries, one which reflects the variety of existing regulations. Indeed, even similar indicator scores do not necessarily imply that legislation is comparable. According to the updated PMR indicators, Luxembourg and Austria exhibit the highest level of regulation, and most other euro area countries are also on the high side, excluding Ireland and Slovakia, whose scores are among the lowest. The tendency towards less regulation which has been observed in the past is once again confirmed in 2010: for all countries where changes in legislation have been recorded since 2008 (i.e. France, Portugal, Belgium and Greece), the respective score is lower in 2010. This can probably be partly explained by the implementation of the EU Services Directive, even though progress here has not necessarily been registered in the field where it was expected. This is because when legislation reduces regulatory constraints, it generally affects multiple areas and other sectors in the same way. However, in some countries, the anticipated impact of the Services Directive[49] is not yet reflected in the indicators (e.g. Ireland, Germany, Portugal, Finland, Greece, Austria and Luxembourg).[50]

A new indicator of the degree of regulation of shop opening times has been developed by Eurosytem staff (for more detailed information, see the Appendix) in order to overcome the limitations of the corresponding PMR sub-indicator of the OECD (see Chart 10). This topic is relevant because some studies have found that the regulation of opening times has an impact on various retail trade and macroeconomic variables.[51] The indicator for

Chart 9 Retail sector regulation – the PMR indicators of the OECD updated for 2010

(range from 0 to 6, with 6 being the highest level of regulation)



Sources: OECD and Eurosystem staff calculations.

47 In this context, it should be noted that some criteria only take into account whether or not regulations exist and do not differentiate between different degrees of legislation. See, for example, Baugnet et al. (2009).

48 This could be important in countries where regional authorities have some competences regarding the retail sub-sector, such as Spain and Germany. For a detailed analysis of the Spanish case, see Matea and Mora (2009).

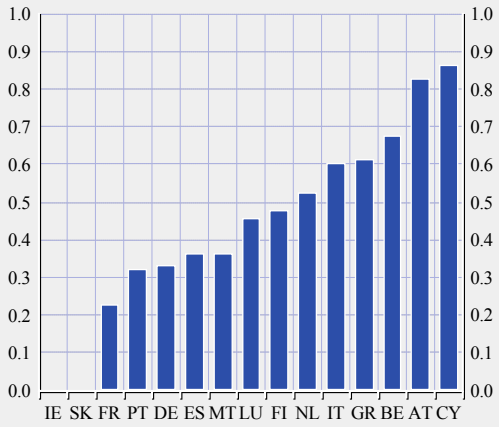
49 It is assumed that the Services Directive has an impact on the "Registration in commercial register" and "Protection of existing firms" sub-indicators. In the first case, this is because Article 13(4) imposes a reasonable deadline for the registration office to confirm and/or approve the registration (a period of more than 70 days is considered to be "unreasonable"). In the second case, this is because Article 14(6) forbids professional bodies or the representatives of trade and commercial interests to be involved in licensing decisions. See also Piette and van der Linden (2009), pp. 85-87.

50 In Spain, the implementation of the Services Directive has increased the threshold for the surface area at which regulation related to large outlets starts applying in the majority of regions, but this has not affected the indicator because the national threshold does not change.

51 For example, Skuterud (2005) provides evidence of how the relaxation of Sunday opening times in Canada resulted in an increase in employment in the sector. Meanwhile, while Burda and Weil (2005) demonstrate how more restrictive US regulations on shop opening times are associated with lower levels of employment, wages and productivity in the retail sector, despite there being no significant impact on prices.

Chart 10 ESCB indicator of the degree of regulation of shop opening hours

(1 represents the highest level of regulation)



Source: Eurosystem staff calculations.
Note: The ESCB indicator of the degree of regulation of shop opening hours has been computed on the basis of information provided by task force members.

opening times, which takes account of the hours, times and days during which establishments are allowed to be open to customers (i.e. through six intermediate variables capturing different regulatory provisions), shows that the extent of regulation on opening times varies markedly from country to country. Cyprus is the country with the strictest regulation, followed very closely by Austria and Belgium. By contrast, retailers in Ireland and Slovakia have full freedom to set their opening times.[52] Meanwhile, although France, Portugal, Germany, Spain and Malta all have regulations, the legislation in these countries is relatively less restrictive compared with the rest of the euro area. It should be noted that there may be differences between the regulation on opening times and the opening times actually applied by establishments, as the latter must also take into consideration other factors, such as labour costs, seasonal demand and the opening times of competitors.[53]

All in all, even if the regulatory environment seems to be moving in the right direction – spurred on, in particular, by the implementation of the Services Directive – further harmonisation and convergence are necessary in order to create the right conditions for inefficiencies to be removed, competition to be fostered, and eventually to allow consumers to reap the benefits of the Single Market, especially in the form of lower prices (see Section 2.1). Of course, coherent regulations on their own are not a sufficient condition for a well-functioning market and balanced competition – other factors also play a role here.

1.3 COMPETITION IN THE DISTRIBUTIVE TRADES

This section reviews alternative indicators of the degree of competition in the distributive trades sector. Measuring the degree of competition in any market is challenging under normal circumstances, but for the distributive trades – with their considerable heterogeneity across sub-sectors and countries (discussed in Section 1.1) and their role as an intermediary between upstream suppliers and downstream customers and the complex interaction that this implies – this may be especially difficult.[54] The section first provides a conceptual overview of alternative approaches and measures together with a discussion of their advantages and limitations.

52 However, in Ireland, certain retail outlets (e.g. licensed premises selling alcohol) are subject to particular requirements in relation to opening hours.

53 Shops in many countries, such as Belgium and Austria, often voluntarily opt for shorter opening hours than they would be allowed under law; in Greece, local retail associations recommend a narrower range of opening hours than what is legally permitted and the vast majority of small establishments adhere to this request; in France, because labour legislation specifies that Sunday is a weekly holiday, a large number of establishments are closed on this day. In addition, in some countries, for example the Netherlands and Austria, "tourist areas" may be subject to less stringent restrictions. However, for the purposes of this report, these are considered as exemptions; the report considers only general regulations governing shop opening times.

54 In theory, as long as there are no barriers to entry, the issue of measuring competition should not really be a concern. This is because any profits beyond those required by a competitive industry would be competed away by firms either entering or exiting. However, in practice, barriers to entry exist, to some degree, in almost every market. Some of these may reflect the nature of the industry (such as scale effects), some may be endogenous to the behaviour of firms (such as product differentiation arising from advertising and innovation) and some may stem from structural rigidities created by product or labour market regulations.

A number of different indicators are considered (concentration, profitability, pass-through) at different levels of spatial (local, regional and national) and organisational (store, parent company and buying group) aggregation, as well as both upstream (producer-related) and downstream (consumer-related) aspects. A general finding is that concentration at the national level is relatively low in the southern European countries owing to the persistence of a more traditional retail structure. However, a unique dataset encompassing the location of over 100,000 individual grocery stores across the euro area is also used to construct regional and local measures of competition. While there are some similarities with the results using national data, there are also some noteworthy differences, with some markets that appear to be relatively fragmented at the national level turning out to be quite concentrated at the local level and vice versa. Overall, the key message is that measuring the degree of competition in the retail trades is not a straightforward matter; it is an issue that should be carefully considered along a number of different dimensions.

1.3.1 CONCEPTUAL OVERVIEW

Given the increasing degree of consolidation in the distributive trades sector highlighted in Section 1.1, it is not surprising that competition authorities around Europe have considered the issue of how to measure competition in this sector from both a conceptual and empirical perspective.[55] Therefore, much of what follows draws on works undertaken by international competition authorities to address a number of key questions. From a conceptual point of view, the section discusses: (a) what the relevant market is; and (b) which, if any, measure of competition is best.

With regard to the relevant market, markets may be defined in many ways, including in terms of geography, sector and segment. As concerns the *geographical dimension*, does it make most sense to consider competition at the local, regional, national, or even international level, or some combination of these? As concerns the *sectoral dimension*, not all retailers are competitors. For example, a pharmacy is presumably not competing with a clothing and footwear retailer. However, the situation may be more complex for other goods and services. For example, a grocer may be competing in many segments, for instance with petrol, specialist food, online or department store retailers, while the latter two may, in turn, be competing with retailers of clothing and footwear or electronics and appliances. Lastly, as concerns the *segmental dimension*, it may be the case that within the grocery trade different types of retailer are not really competing with each other for the same market segment. For example, large supermarkets, which generally carry a wide range of products of varying quality, price and brand, and hard discounters, which generally carry a limited range of unbranded products, may not be in direct competition with each other. Another issue particularly relevant to the distributive trades sector is the distinction between upstream competition in respect of buying power and downstream competition in respect of selling power. It could be the case that, owing to competition from other retailers, a large retailer has little power downstream, but if it is large relative to a local supplier it may have complete buying (or monopsony) power upstream, at least for certain products.

With regard to the question of which measure of competition is best, the following sections consider two broad measures of competition based on: (i) concentration and (ii) profitability.

55 As mentioned above, the Competition Authority of Ireland conducted two studies on the Irish retail market in 2008 and 2009. The UK Competition Commission completed a comprehensive two-year inquiry into the UK grocery sector in 2008. More recently, in 2010, Austria's federal competition authority (Bundeswettbewerbsbehörde) conducted some work on the liquid fuels market; in Spain, the National Competition Commission (Comisión Nacional de la Competencia) studied the automotive fuel sector in 2008 and 2011; in Bulgaria, the Commission on Protection of Competition has analysed the relationship between supermarket chains and suppliers; and in Portugal, the Competition Authority (Autoridade da Concorrência) concluded the "Relationship between the Large Retail Groups and their Suppliers" report in 2010. Only recently, in February 2011, Germany's federal cartel office (Bundeskartellamt) announced that it had started investigating the relationship that the country's leading grocery retailers had with their suppliers.

EX ANTE CONCENTRATION VERSUS EX POST PROFITABILITY

Concentration measures

Concentration measures may be considered as an ex ante indicator of potential competition. This is because, although a market with low concentration (i.e. many firms with low market shares) is likely to be more competitive than one with high concentration (i.e. few firms with a high market share), it could actually be the case that a market with only two players features more fierce competition than one with many players where explicit or implicit collusion has developed.[56]

The concept of industry concentration and the construction of indices measuring concentration has been widely analysed in the economic literature. The two elements that characterise these measures are: number ("fewness") of firms and market share equality/inequality. Whenever such indicators are used, it is implicitly assumed that the degree of competition of a market structure is higher if the share of demand served by each firm is lower. The most commonly employed concentration measures are: (1) the *k-firm concentration ratio* – CR_k,[57] involving the sum of the market shares of the k largest firms, which are all given an equal weight; limitations of this measure arise from the arbitrariness in the choice of k and the bias induced by excluding the other firms (n-k) in the market; and (2) the *Herfindahl-Hirschman Index* – HHI;[58] here, the weights increase with firm size and all the n firms are considered.

The CR_k indicator is calculated as the cumulated market share of the top k companies in a given market (e.g. CR_1 is the market share of the leading company, whereas CR_5 is the combined market share of the top five leading companies in the market). Although there is no fixed rule as to which k to select, Dobson (1999), in his study of buyer power and its impact on competition in the food retail sector, uses the CR_5 indicator. In Chapter 2, it is found that the CR_5 indicator may contain the most information regarding price level differentials.[59]

The HHI is the most widely used concentration measure, and is frequently the reference market power index for competition authority guidelines relating to the evaluation of mergers and acquisitions. Theoretically, this measure can range between zero and 100 (zero being where there are an "infinite" number of "infinitely" small firms, and 100 being where there is a monopoly with a market share of 100). The HHI takes into account both the relative size and the distribution of the firms in a particular market. While there is no set rule for interpreting the HHI, and the caveats about interpreting concentration as a measure of competition must be kept in mind, a rule of thumb is to consider a market with an HHI below one as highly competitive, a market with an HHI below ten as relatively unconcentrated, a market with an HHI between 10 to 18 as moderately concentrated, and a market with an HHI above 18 as highly concentrated.

Profitability measures

Profitability measures may be considered as ex post indicators of competition, as they are the outcome of decisions made by competing firms. In principle, profitability in a highly competitive market should be driven down

56 An additional complicating factor in respect of using concentration measures to gauge the degree of competition and social welfare is that it could be the case that, owing to restrictions related to entry and expansion, a market is highly fragmented and has many small incumbent players plus local monopolies that operate relatively inefficiently. In contrast, in another market – one that has developed with "free" entry and exit – there may be a smaller number of larger players who compete strongly against each other and have operations that are relatively efficient.

57 $CR_k = \sum_{i=1}^{k} s_i w_i$, where s_i is the market share of firm i $0 < S_i \leq 100$ and $w_i = \begin{cases} 1 \ \forall i = 1,...,k \\ 0 \ \forall i = k+1,...,n \end{cases}$

58 $HHI = \left[\sum_{i=1}^{n} S_i^2 \right] / 100$. Note that $\frac{100}{n} \leq HHI \leq$ The minimum (zero) is attained in the case of perfect competition, whereas the maximum implies a monopolistic market structure. Note that, depending on how the market share is defined, the HHI is also sometimes presented on a scale of zero to unity or zero to 10,000.

59 Choosing a low "k" may place too much emphasis on the leading firms, whereas choosing a high "k" may not provide much additional information as the market share tends to tail off at around four to six companies in most sectors.

to a minimum acceptable level. However, in practice, measuring profitability is challenging, and the more easily calculated measures have limitations and thus need to be interpreted with caution. An ideal measure would be a firm's rate of return on capital as, ultimately, this is what investors in firms should be trying to maximise. However, measuring a firm's capital is also an extremely challenging task, one with many potential pitfalls.[60] Therefore, this section focuses primarily on profit margins, even if these have limitations.[61,62]

Equation 1 below shows that there is a relationship between a firm's return on capital and its profit margin, which is determined by the "capital turnover" (or "turnover per unit of capital employed"). Given that competitive behaviour by investors should give rise to a tendency to equalise (risk-adjusted) rates of return on capital, equation 1 suggests that profit margins may be a useful indicator of our preferred measure of profitability. However, there is one important caveat. Equation 1 underlines that this relationship depends on the capital turnover, which may vary substantially, particularly across sectors. For example, in the retail trade sub-sector, it is a well-known fact that the degree of capital turnover is quite high. Therefore, comparing profit margins across sectors is risky, even when they are seemingly similar (for example, as discussed in Section 1.1, profit margins in the grocery and non-grocery retail trade are quite different), and may also be misleading if interpreted at face value.[63]

(1) Return on capital (P/K) = profit margin (P/S) * capital turnover (S/K),
where P = profit, K = capital, S = turnover or sales

SHOULD COMPETITION BE ANALYSED AT THE NATIONAL OR LOCAL LEVEL?

As discussed above, an important issue when measuring competition is to define the relevant market. A key aspect of this is the *geographical dimension*. Should the market be considered at a *local*, *regional*, *national* or *international* level? A priori, the answer to this question is not so clear-cut, as retailers operate at all these levels (local – store; regional – logistics; national – parent company administration; international – large players and big buying groups).

From an individual consumer's point of view, what probably matters most is competition in his/her local catchment area.[64] Furthermore, there is evidence to suggest that the number of rivals located close to a store affect its performance (defined as store-level margins excluding fixed costs).[65] The issue of price-setting behaviour is clearly one of interest to monetary policy-makers. If competition is truly local, one would expect that retailers set prices according to local demand and supply (cost and competition) factors. However, it has been found that many large retail chains set prices at the national level, while perhaps allowing for some degree of price variation at the local store level via variable discounting. Another way retail chains may alter local margins without changing prices is by varying costs, for example in terms of the quality

60 These pitfalls include, for example, the following questions: how is capital valued; how does a firm treat its property holdings (are they embedded with the main group or held by a separate entity, or does it simply rent the bulk of its property requirements); and whether it is possible to measure intangible capital, such as that generated by advertising, research and development.

61 The UK Competition Commission, in its 2006 to 2008 inquiry into the UK grocery sector, relied extensively on an analysis of margins calculated at the store level – using data provided by retailers themselves. For a more complete discussion of the use of profitability analysis to determine the degree of competition, see Felet and Moiloa (2009).

62 This report does not discuss another profitability-based indicator of competition, namely the "Boone indicator" or "profit elasticity indicator". However, the analysis of pass-through in Section 2.4 would accord with this indicator.

63 Another caveat to be mentioned is that the data for the concentration and profitability indicators come from different sources (Euromonitor and Eurostat's SBS database respectively), which use different classification systems (such as size, characteristics, sector, store/non-store). This unfortunately makes it difficult to compare and cross-check measures.

64 According to the European Commission (2010), pp. 30-31, "the application of competition law to retail sales of daily consumer goods (i.e. hypermarkets, supermarkets and discount chains) has found that from the consumer perspective, the boundaries of a catchment area where the outlets can be reached easily concern a radius of approximately 20 to 30 minutes driving time".

65 UK Competition Commission, "Note on store margin analysis", prepared as part of the 2006 to 2008 inquiry into the grocery sector.

of service offered via staffing levels, in-store display and design.[66]

Empirical evidence on national and local pricing

First, considering the international evidence, it appears that there is a degree of *national pricing*. In the *United Kingdom*, the Competition Commission, in its 2006 to 2008 Grocery Sector Inquiry, reported that uniform national pricing was predominant. It found limited variation in prices across store networks, and nearly all of the main grocery retailers surveyed stated that they set national prices;[67] national prices have largely been introduced here since 2000. However, the report also added that "vouchering" was a means by which grocery retailers might adjust prices locally in the context of national pricing. In *Australia*, in 2010, all of the major supermarket chains had a national pricing policy. In *South Africa*, Myburgh et al. (2007) note that in a number of retail mergers the South African competition authorities have relied on the principle that national retail chains that set prices centrally compete in a national market.[68] In the United States, Nakamura et al. (2010) use a large scanner price dataset to study grocery price dynamics and find evidence in favour of national pricing.[69]

Given the importance of this issue, this report takes an agnostic stance, preferring to rely on empirical and survey evidence and to allow for the fact that some firms may adopt national pricing whereas others may adopt local pricing. Therefore, it first reports on measures of competition based on national data and then turns to measures of competition based on local data.

1.3.2 EMPIRICAL MEASURES OF COMPETITION USING NATIONAL DATA

CONCENTRATION

This section presents empirical measures of market concentration based on data from Euromonitor, which, in terms of the distributive trades sector, are only available for the retail sub-sector. It first considers the different measures (HHI and CR_k) outlined above and how these correspond to each other. Thereafter, the ranking of concentration measures across sectors is considered. The patterns of concentration across sectors and their evolution over time are also discussed.

As regards the different concentration measures, both the HHI and a range of CR_k measures of concentration for grocery retail trade are first considered to illustrate their relationship and interpretation. Table A8 in the Appendix presents both the HHI and a number of CR_k measures for grocery retailing. Generally, the cross-country pattern of the HHI and CR_k measures is relatively similar, with the last row in Table A8 showing a high correlation between the CR_k measures and the HHI. Chart 11, which shows the cumulated CR_k measures for euro area countries, illustrates that the CR_k measures tend to tail off very quickly after the fourth-largest firm, with the possible exception of the larger economies. The pattern across time is also relatively similar.

A general result, regardless of which measure is used, is that concentration is relatively low in the southern European countries (Greece, Italy, Spain and Portugal), followed by Slovakia and Belgium. The highly fragmented nature of the Greek grocery trade is illustrated by the fact that the market share of the nine leading companies

66 Cotteril (2007) argues that "local market cost and demand conditions vary. The fact that firms charge the same shelf price for a product throughout the country strongly suggests the following alternatives. Either firms vary the product mix and use local vouchers to correspond to cost and demand changes or one has coordinated pricing among firms."

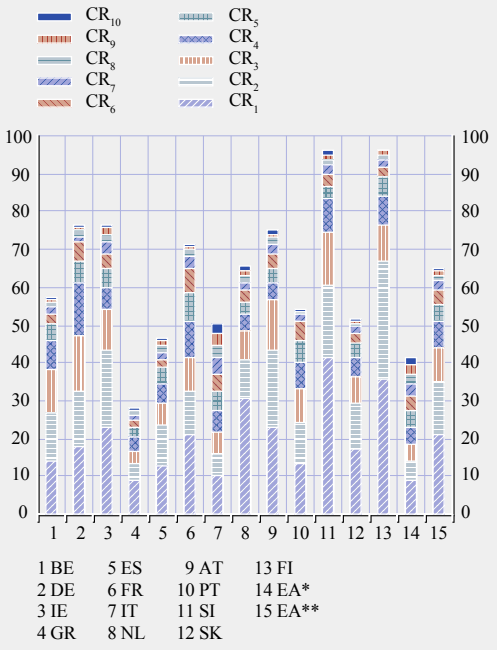
67 The report also clarified that, although for some retailers, such as Tesco and Sainsbury's, prices may vary between their smaller (convenience) and larger (supermarket) format stores, these price variations reflect the higher operating costs of smaller stores rather than local competitive conditions (this information was provided by the retailers themselves).

68 Note that this study also argues that the use of the "national pricing principle" to justify analysis of competition at the national level is "an example of a heuristic. One which reduces the complexity of the enquiry (a region by region analysis does not need to be done) but increases the likelihood of error (the anticompetitive consequences of mergers may be over or under-estimated)".

69 Although they document large differences in price movements across different grocery store chains, they note that a variance decomposition indicates that characteristics at the chain level (as opposed to the level of individual stores) explain a large fraction of the total variation in price dynamics. It appears that this pattern also applies to sales discounting.

Chart 11 Cumulated concentration measures (CR_1 - CR_{10}) for grocery retailing

(average 2004-2009)



Sources: Euromonitor (2011) and Eurosystem staff calculations.
Note: "EA*" denotes values when the euro area is considered as a single country; "EA**" is the average of the country values.

amounts to 27.7%, which compares with an average of 64.2% for the euro area. On the other hand, Finland, Slovenia, Austria and Ireland have the highest concentration rates. The highly concentrated nature of the Finnish and Slovenian grocery trades is underlined by the fact that the top three companies in these countries have a market share of around 75%, which compares with a euro area average of 44.2%. It should be recalled that a low degree of concentration is not necessarily a measure of high competition, as this may also represent a very fragmented sector where economically beneficial consolidation is restricted by regulation and barriers to entry. Similarly, although a higher degree of concentration would suggest less competition, other things being equal, it could be the case that the beneficial impact of the efficiency gains arising from higher concentration might outweigh the negative effects emanating from lower competition.

The degree of concentration varies substantially across the retail trade sub-sector. On average, across the euro area, the most concentrated parts of this sub-sector tend to be the electronics and appliances (E&A) and the grocery (groc.) markets, at 14.2 and 9.8 respectively – see Table A9 in the Appendix. The other parts of the retail sub-sector tend to have lower concentration rates.[70] There has been a slight upward drift in the HHI observed for grocery retailing, which is also seen elsewhere in the retail sub-sector. This mirrors the ongoing consolidation in the European retail sector discussed in Section 1.1. This consolidation may reflect industry forces acting to reduce fragmentation, to improve economies of scale and to increase efficiency. But it may also reflect the difficulties created by regulatory restrictions, particularly in respect of planning requirements that hinder the opening of larger sized stores – an issue discussed in more detail above.[71] There was a strong increase in concentration in electronics and appliances retailing, which was already the most concentrated part of the retail sub-sector.

PROFITABILITY

This section considers measures of profitability, more specifically profit margins, as indicators of competition. Although they are not without their limitations, profitability-based measures may reflect actual market competition better than concentration measures, as the degree of concentration can have positive or negative consequences depending on whether competitiveness or efficiency-related effects are predominant. Table 3 presents the profit margins for the main parts of the distributive

70 Interpreting HHI measures is far from straightforward. In the United States, when considering company mergers, competition authorities tend to focus on the level of the HHI after the merger, whereas, in the EU, authorities tend to focus on the change in the HHI that would be brought about by the merger as well as the actual level of the HHI. Beyond these issues, a far more crucial issue is what the relevant "market" is in terms of economic sector and geography, etc.

71 While, a priori, one might expect a positive relationship between the rankings of concentration measures across countries and some geographic and demographic features (e.g. geographical area, population or population density), no obvious or striking correlation was found.

Table 3 Profit margins in the distributive trades sector – unadjusted and adjusted for the implicit labour income of the self-employed [1)]

(percentages)

	Distributive trades		Wholesale		Retail		Grocery retail		Non-grocery retail	
Unadjusted	**G**		**G51**		**G52**		**G5211**		**G52X11**	
Euro area	6.1		5.5		7.6		4.3		9.5	
Max.	9.8	GR	9.3	GR	11.5	GR	8.6	GR	12.4	GR
Min.	3.7	FR	2.9	FR	4.2	SK	1.8	SK	5.0	SI
Std. deviation	1.6		1.7		1.9		1.6		2.2	
Adjusted	**G**		**G51**		**G52**		**G5211**		**G52X11**	
Euro area	4.7		4.7		5.2		3.6		5.9	
Max.	6.3	GR	7.5	GR	7.4	NL	6.5	SI	8.3	NL
Min.	2.8	BE	2.8	FR	2.4	IT	1.2	IT	3.2	IT
Std. deviation	1.1		1.2		1.3		1.3		1.4	

Sources: Eurostat SBS database and Eurosystem staff calculations.
1) As noted in Chapter 1.1, the high proportion of self-employed in the distributive trades sector (especially in the grocery market of some countries) may have an impact on the comparability of reported profits and profit margins. Therefore, it may be desirable to adjust for the imputed labour income of the self-employed. The data in the table have been adjusted using the same method outlined in Section 1.1.

trades sector. On the basis of profit margins being unadjusted for the imputed labour income of the self-employed, it is found that profit margins are highest in the retail sub-sector (7.6%), and especially in non-grocery retailing (9.5%), while they are lowest (4.3%) in grocery retailing. Although the pattern here is not as clear as that for concentration measures, some of the southern European countries, most noticeably Greece, Spain and Italy, tend to have relatively high profit margins. However, this is partially explained by the high share of self-employed workers in these countries, as their relative rankings improve when margins are adjusted (see Table A10 in the Appendix), i.e. their profit margins become relatively lower. There is also a considerable degree of variation in margins across countries: the standard deviation of around 2% on average is approximately 33% of average profit margins, although this is reduced to nearly 1% when adjusted profit margins are considered.

As regards profit margins in specific parts of the retail sub-sector (see Table 4), these appear to be relatively high, at close to or above 10%, in specialised areas of retailing: clothing and footwear; books, newspapers and stationery; and miscellaneous retailing in specialised stores. Margins are slightly lower, although not as low as in grocery retailing, in furniture and fittings, electronics and appliances, and DIY. The variation across countries also tends to be higher

Table 4 Profit margins in specific areas of the retail sub-sector

(percentages)

	Clothing/ footwear		Furniture/ fittings		Electronics/ appliances		DIY		Books, etc.		Misc.	
Unadjusted [1)]	**G524cf**		**G5244**		**G5245**		**G5246**		**G5247**		**G5248**	
Euro area	9.8		7.6		5.9		7.9		10.1		9.3	
Max.	14.1	GR	12.8	GR	9.3	GR	14.5	GR	12.5	GR	12.2	NL
Min.	2.1	SK	4.2	PT	3.5	AT	3.6	AT	2.9	LU	5.3	SK
Std. deviation	2.9		2.0		1.6		2.7		3.3		2.4	
Adjusted [2)]	**G524cf**		**G5244**		**G5245**		**G5246**		**G5247**		**G5248**	
Euro area	6.4		4.8		3.6		5.5		5.2		5.3	
Max.	9.3	NL	8.9	SI	8.0	SK	9.2	GR	7.3	FI	9.1	NL
Min.	2.6	IT	1.9	PT	0.7	IT	2.3	AT	0.8	LU	3.4	IT
Std. deviation	2.0		2.1		1.9		2.0		2.1		1.9	

Sources: Eurostat SBS database and Eurosystem staff calculations.
1) Not adjusted for the implicit labour income of the self-employed.
2) Adjusted for the implicit labour income of the self-employed.

in specialised retailing areas, at around 3%, but is lower for furniture and fittings and for electronics and appliances, perhaps reflecting the more internationalised nature of these parts of the retail sub-sector.

A cross-check of the concentration and profitability measures suggests that there is generally a positive correlation between concentration and profitability for both grocery and non-grocery retailing as a whole, i.e. a higher concentration is associated with higher profitability across the countries covered.[72]

RETAILER VERSUS SUPPLIER POWER

As already noted, a key feature of the distributive trades sector is that it functions as an intermediary between industry and consumers. In this regard, it is not only the degree of competition downstream (i.e. with respect to customers/consumers) that may be important, but also the degree of competition upstream (i.e. with respect to producers). The OECD's 2008 Roundtable on Monopsony and Buyer Power referred to this as "buying power", but distinguished between monopsony power and bargaining power. It argued that "the welfare implications, and therefore the appropriate enforcement policies, of the two types of buyer power are very different. Both result in lower input prices, but the exercise of monopsony power usually results in higher prices downstream. Reductions in input prices in the case of bargaining power are typically beneficial". Mills (2003) reports the finding by the UK Competition Commission (2000) that the largest retailers in the United Kingdom paid less than their smaller counterparts to suppliers for certain major branded goods. One rationale frequently given for the evolution of buying groups is the desire of retailers to be able to counteract the bargaining power of leading manufacturers.[73] However, it is often argued that small suppliers, in particular, are vulnerable to the anti-competitive practices of large supermarket chains. The interaction between supplier and retailer bargaining power is discussed in more detail in Section 2.4, in the context of cost pass-through to food prices.

1.3.3 EMPIRICAL MEASURES OF COMPETITION USING STORE-LEVEL DATA

Different studies have pointed out the relevance of measuring local-level competition in the distributive trades sector, as the consumer may primarily get information from a limited set of stores close to his/her home and compare the relative prices of the goods sold at these stores.[74] In this respect, concentration measures at the national level may overestimate the degree of competition if retail stores are geographically spread out, implying a lack of competition at the local level. However, local-level concentration measures may also present some shortcomings. For example, it may be that a definition of local markets based on distance should not apply equally to a large, densely populated urban area and a remote, sparsely populated rural area.

To evaluate the degree of concentration at the local level in the retail sub-sector of the larger euro area countries (i.e. Austria, Belgium, Finland, France, Germany, Greece, Italy, the Netherlands, Portugal and Spain), concentration measures are computed using the Nielsen structural data for 2010 described in the Appendix; see the description of the Nielsen store location data. Concentration is evaluated in: (a) the downstream market, namely among parent companies and individual stores; and (b) the upstream market, at the buying group level. The market shares used in

72 However, this only holds for profit margins adjusted for the implicit labour income of the self-employed – perhaps owing to the impact of a high degree of self-employment on market fragmentation.

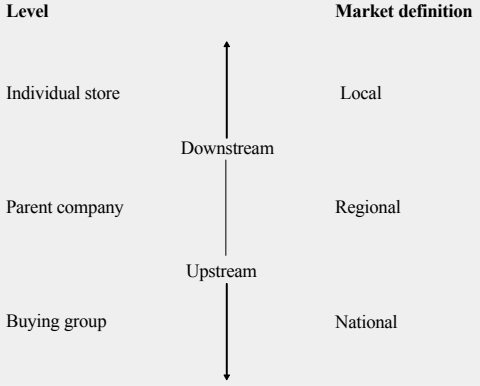
73 Information from two Deloitte reports in 2010 – "Global powers of the consumer products industry" and "Global powers of retailing" – shows that in both these segments, the largest players have reached a substantial scale. The producers ranked 10th, 20th, 30th, 40th and 50th have sales of USD 64 billion, USD 32 billion, USD 22 billion, USD 19 billion and USD 16 billion respectively, while the equivalent largest retailers have sales of USD 65 billion, USD 47 billion, USD 32 billion, USD 29 billion and USD 16 billion respectively.

74 See, for example, the report on the UK Competition Commission inquiry mentioned above.

the concentration measures are based on the sales area, in square metres, of the stores involved.[75] The precise definition of the "relevant local market" is subject to discussion (see, for example, Cotteril (2007); or Perdiguero and Borrel (2008)), but a similar approach is followed to that used in Baugnet et al. (2009), defining a local market for each store as the sum of competitors within a radius of 5 km and 10 km.[76]

This section presents a range of different measures of market concentration using data on individual store locations. This is because competition may be multi-dimensional and viewed from a number of different perspectives. Chart 12 provides an illustrative overview of some of the different dimensions considered. First, competition may be measured at different levels, i.e. at the individual store, parent company or buying group level. Second, different definitions of the relevant market may be considered: local, regional or national. While measures of concentration at the buying group and individual store levels may be more relevant for understanding upstream and downstream developments respectively, measures applied at the parent company level may be relevant in both directions. Similarly, while measures of competition based on defined national and regional markets may be more relevant for understanding the power of retailers vis-à-vis producers, perhaps those using local markets are more relevant for understanding retailer power vis-à-vis consumers.

Chart 12 Conceptual overview of different dimensions for measuring market concentration



Source: Eurosystem staff.

Downstream local markets: store and parent company levels

Starting with concentration measures of most relevance to downstream markets, Table 5 provides the national average of the HHIs computed for each local market.[77] Market shares are computed at both the store and parent group levels in order to take into account the possible lack of competition between stores located close to each other and belonging to the same parent company.

At the *store level*, when using either a 5 km or a 10 km radius to define respective local markets, Portugal, France and Finland show the most concentrated market structure, with HHIs above the euro area average.[78] By contrast, the Netherlands and Austria provide examples of more fragmented retail trade markets in the euro area. However, when the local market is defined

75 Counters and turnover are other possible criteria that can be employed to construct market shares. However, square metres are used here, because sales area data are available for all the countries in the dataset. Whenever possible, the same measure is computed based on the three indicators and a correlation larger than 0.9 is found. Thus, it can be concluded that square metres are a good indicator of market share.

76 First, geographical coordinates (longitude and latitude) are computed using the precise location information available in the dataset. Bulkgeocoder.com was used for this purpose. A more detailed description of this procedure, and the issues that one should be aware of, is provided in the Appendix (Table A24). The robustness of the results will also be checked by allowing for a different local market that depends on the store size.

77 This involves calculating HHIs for each of the approximately 130,000 stores in the database, which in turn requires calculating the distance between each store. Theoretically, there are approximately 10 billion store pairings, although this number has been reduced by eliminating clearly non-contiguous pairings (for example, between Finnish and Greek stores). The individual HHIs are then aggregated (using the store size as a weight) to provide the national averages presented in the tables.

78 Some caution is required when characterising the relative degree of concentration of the Greek retail trade market. As can be seen in Table A24, the precision of geo-coding results is significantly lower for Greece than for the other countries. This may mean that the measures used here underestimate concentration if distant stores are geo-coded in the same location because of the lower precision.

Table 5 Downstream concentration measures using a *local market definition* – national averages of local HHIs computed at the store and parent company levels

	Store level			Parent company level			
Country	5 km	Country	10 km	Country	5 km	Country	10 km
NL	13	NL	4	BE	21	BE	12
AT	15	BE	6	AT	23	AT	16
IT	16	AT	7	IT	24	IT	17
ES	16	IT	7	ES	25	ES	20
BE	16	DE	7	GR	27	FR	21
DE	16	ES	9	DE	29	GR	22
GR	17	GR	11	NL	30	PT	24
PT	23	PT	14	FR	31	DE	24
FI	26	FR	16	PT	32	NL	26
FR	27	FI	19	FI	40	FI	38
Euro area average	19	Euro area average	9	Euro area average	28	Euro area average	21

Source: Eurosystem staff calculations based on information from the Nielsen store location database.

as having a larger radius (10 km), Belgium shows a similarly low concentration level, followed by Italy, Spain and Germany. The latter two countries are both close to the euro area average.[79]

At the *parent company* level, the HHIs show a similar picture in Table 5. Portugal and Finland remain as the countries with a higher market concentration in the area of retail trade, while Belgium and Austria show lower levels of concentration. However, noteworthy differences appear for some countries. In particular, the high fragmentation of retail trade found at the store level in the Netherlands is not confirmed once parent companies are taken into consideration. On the other hand, France shows a lower concentration in its retail trade, with this now being closer to the euro area average.

Table 6 Upstream concentration measures using a *local market definition* – national averages of local HHIs computed at the *buying group level*

Country	5 km	Country	10 km
BE	26	BE	20
IT	28	IT	21
NL	30	PT	24
PT	32	NL	25
ES	33	FR	25
DE	33	DE	27
AT	34	ES	28
FR	34	AT	30
FI	40	FI	37
GR	53	GR	50
Euro area average	33	Euro area average	26

Source: Nielsen store location database.

Upstream local markets: buying group level

The degree of concentration in upstream channels may also be relevant for the description of the structure of the distributive trades sector. The Nielsen dataset also provides information on buying groups, and HHIs have been computed aggregating buying group market shares across local markets. The results, which are presented in Table 6, show some differences compared with those obtained at the downstream level. Greece joins Finland among the countries with a higher degree of concentration in the distributive trades sector, while Portugal and France – which both showed high concentration at the downstream level – now show lower levels of concentration upstream (in relative terms), especially in the context of the 10 km results. Austria shows the opposite pattern, with market concentration being low downstream,

79 The correct definition of the relevant local market may vary across *outlet types*. In particular, it is possible that the relevant local market for a supermarket is larger than the one for a small store. To check the relevance of this issue, HHI national averages can be computed using different local markets, depending on the store size. For large supermarkets, the HHI is computed using a 10 km radius for the local market, while for smaller stores the index is based on a local market with a radius of 5 km. In this case, the country ranking is quite similar to the one observed in Table 5, although Austria displays a concentration level more similar to the euro area average.

but higher upstream. Meanwhile, Belgium, Italy and the Netherlands feature among those countries with lower concentration, as was the case at the downstream level.

Upstream and downstream concentration in regional and national markets

The results of local-level measures of concentration may be compared with those obtained using national and regional markets as the geographical reference point. Using *regions* as the reference market shows that, among the mainland areas, in Finland – the most concentrated country at the upstream and downstream levels – Itä-Suomi stands out.[80] Vorarlberg is the region with the highest concentration in terms of Austrian buying groups, while Tirol is most concentrated in terms of both parent companies and shops. Meanwhile, the German upstream and downstream markets are very concentrated in Sachsen-Anhalt. In Italy, Lombardy tends to be the least concentrated region in the country in terms of all three of the measures considered. Excluding Corsica, in France, buying groups are most concentrated in the Île-de-France; the equivalent area for parent groups and shops is the Pays de la Loire. In Spain, concentration is high in Extremadura with regard to the upstream market and in the Basque Country for parent groups and shops. Walloon Brabant in Belgium and Anatoliki Makedonia, Thraki in Greece show the highest level of concentration in their respective countries. In the Netherlands, the province of North Holland, which also includes Amsterdam, is relatively highly concentrated, while Drenthe is the least concentrated region. Lisbon shows a high level of concentration in Portugal at the shop level.

Using the Nielsen store location database, Table 7 provides HHI concentration indices computed at the *regional level* for both the parent company (downstream) and buying group (upstream) levels. *Downstream*, Finland and Germany have the most concentrated retail trade market, with Belgium also above the euro area average. Italy, France and Austria show a low degree of concentration. Furthermore, about 70% of the Finnish market is accounted for by the two largest parent companies – see Table A11 in the Appendix. In Germany, more than 33% of the retail market is served by the foremost parent group and about 25% by the second-largest one. The market structure in Italy appears more fragmented, as the two leading parent groups here have a combined market share of only 20%, with each one holding about 10%. There is one main parent company responsible for approximately 20% of the market in Greece, Belgium and Spain. In Portugal, the top two companies have a downstream market share of about 40% together, while in France there are about 50 parent groups and the two largest ones account for about 30% of the French market.

Table 7 HHI at the buying group (upstream) and parent company (downstream) level in the retail sub-sector

Country	HHI – BG	Country	HHI – PC
IT	12.8	IT	5.8
FR	15.1	FR	7.9
PT	15.8	AT	8.2
ES	19.9	ES	9.5
GR	21.2	GR	11.0
NL	21.4	NL	12.1
BE	22.5	PT	13.2
DE	24.7	BE	19.0
AT	25.2	DE	21.6
FI	37.9	FI	31.0
EA	**19.4**	**EA**	**12.6**

Sources: Nielsen, BNB and Eurosystem staff calculations.
Note: "BG" denotes buying group; "PC" denotes parent company; and "EA" refers to the euro area.

When local-level measures are considered (i.e. when Table 7 is compared with Table 5), a similar characterisation of the level of concentration appears for some countries. For instance, both Italy and Austria feature among those countries where retail trade is more fragmented, while a very high level of concentration is found in Finland. However, some differences also appear. According to

80 All the islands in the sample (Ahvenanmaa, Corsica, Ionia Nisia, Voreio Aigaio and Notio Aigaio) can be considered as outliers (see also Section 2.3), as the mean number of shops is lower than the national average for their respective country. Ionia Nisia, Notio Aigaio and Voreio Aigaio have 24, 30 and 19 shops respectively. This compares with an average of 300 stores per region for Greece as a whole.

national-level measures, the retail markets of Germany and Belgium are much more concentrated at the national level than at the local level, while in Greece and France, local-level measures tend to show a higher level of concentration.

At the *upstream level*, Table 7 shows that the Finnish and Austrian retail markets are the most concentrated ones, while Italy and France have the most fragmented upstream markets. More specifically, in both Finland and Austria, the two leading buying groups have a concentration ratio in the range of 30% to 50% (see Table A12). In Finland, the largest buying group, including just the country's biggest parent group, has a market share of 45.9% – the highest in the sample. The second-largest buying group, including the second-largest parent company and other independent retailers, accounts for more than 33% of the rest of the market. Meanwhile, the first and second-largest Austrian buying groups have an upstream market share of above 33%, the former including many discounters as it is also a parent company and the latter being represented by its banner retailers. The upstream market in Italy shows a much more fragmented structure; the biggest buying group is the only one accounting for a market share of more than 20%, whereas the third, fourth, fifth and sixth-largest buying groups have a market share of about 10%. A relatively fragmented market structure is also typical of Portugal: here, the biggest buying group holds a 25% market share and the second-largest one a share of 21.4%. The other countries occupy an intermediate position in the ranking of upstream market concentration. In particular, in Germany, Belgium and the Netherlands, the largest buying group accounts for about 33% of the market; in France and Spain, the leading buying groups hold a market share of 25% and 28% respectively.

As regards the situation upstream, the comparison with local-level measures tends to show a more similar country ranking when both approaches are used. However, the concentration in the Greek distributive trades sector is higher when local-level measures are considered.

In conclusion, in this section, different measures for assessing the concentration of the retail trade market in euro area countries have been provided, using a national, regional and local approach based on structural data from Nielsen. This exercise may provide a useful insight into the structure of the distributive trades sector in the euro area. As regards the downstream market, some differences appear depending on the geographical market used. In all cases, Finland generally shows a high degree of concentration in this sector. On the other hand, Italy is among those countries with one of the most fragmented market structures. If one compares the results of measures based on national and regional markets with those of measures based on local markets, the ranking for some countries changes significantly. For example, the Greek retail trade market appears to be quite fragmented at the national level but is less so when local market

Table 8 Summary of downstream concentration measures

	National market by parent company	Regional markets by parent company	Local markets (5 km) by parent company	Local markets (5 km) by store
Upper three	Finland	Finland	Finland	France
	Austria	Austria	Portugal	Finland
	Netherlands	Germany	France	Portugal
Middle four	Germany	Belgium	Netherlands	Greece
	France	Netherlands	Germany	Germany
	Belgium	Greece	Greece	Belgium
	Portugal	Spain	Spain	Spain
Lower three	Spain	Portugal	Italy	Italy
	Italy	France	Austria	Austria
	Greece	Italy	Belgium	Netherlands

Table 9 Summary of upstream concentration measures

	Regional markets by buying group	Local markets (5 km) by buying group
Upper three	Finland	Greece
	Germany	Finland
	Belgium	France
Middle four	Portugal	Austria
	Netherlands	Germany
	Greece	Spain
	Spain	Portugal
Lower three	Austria	Netherlands
	France	Italy
	Italy	Belgium

measures are applied. Equally, local market measures indicate that the Austrian market may not be as highly concentrated as national or regional measures would suggest.

As regards the upstream market, Finland again tends to show high concentration when both regional and local measures are used, while Belgium's market structure appears to be highly concentrated in terms of regional measures but less so in terms of local measures. On the other hand, Italy displays a relatively fragmented market at the buying group level under both approaches. In contrast, while the French upstream market appears to be relatively fragmented based on regional measures, it is relatively highly concentrated from the point of view of local markets.

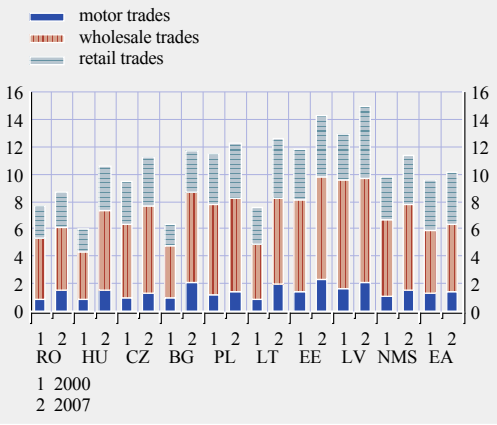
Overall, given the different country rankings provided by the various concentration measures (depending on whether the focus is on a reference market (local, regional or national) or on downstream or upstream market power (store, parent company or buying group level)) and the fact that these different aspects can be important in various contexts, one should rely not on a single indicator but on a more holistic view and understanding of individual markets.

Box 5

THE DISTRIBUTIVE TRADES IN THE NEW MEMBER STATES

The economic development of the new Member States (NMS)[1] over the last decade has been marked by fundamental changes that were largely prompted by the accession of these countries to the EU. A process of real convergence has resulted in these countries narrowing the per capita income gap with the old Member States. This economic catching-up has been associated with an increasing significance of the distributive trades sector for the economies of the NMS. This box aims to outline the macroeconomic importance of the sector for the NMS, to present its main characteristics and to draw, as far as possible, some inferences for inflation developments based on a descriptive aggregate-level analysis.

Chart A Gross value added in the distributive trades sector



Sources: Eurostat, National Accounts and Structural Business Statistics.
Notes: "EA" refers to euro area; Greece and Malta are excluded due to data limitations.

1 The analysis includes the following countries: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland and Romania.

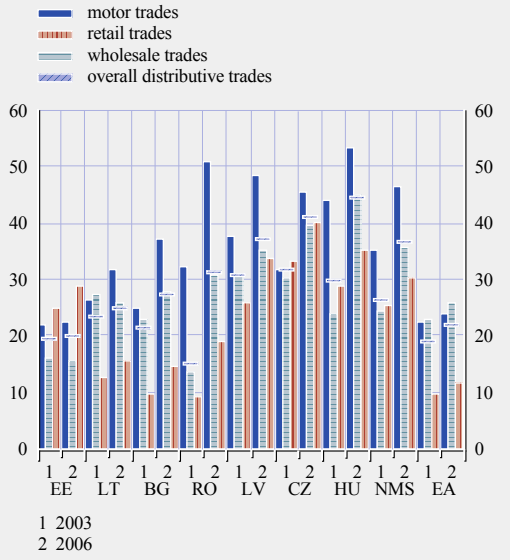
Macroeconomic importance

Over the period 2000 to 2007 the sector's share of gross value added grew substantially in most NMS, compared with the more moderate developments in euro area countries (see Chart A).[2] A sectoral breakdown shows that, of the three main sub-sectors, the wholesale sub-sector has greater importance in terms of the value added generated (similarly to euro area countries).

Foreign direct investment (FDI) has been an important driving factor behind developments in the distributive trades sector. Even though the number of foreign-controlled enterprises is not large, amounting to only between 1% and 6% of the total number of firms, these enterprises have accounted for an increasing share of total turnover (see Chart B). In 2006 the share of turnover generated by foreign enterprises was in the range of 20% to 30% in Estonia, Lithuania and Bulgaria, and between 40% and 50% in the Czech Republic and Hungary. The distributive trades sector represents a significant proportion of economy-wide investment, with around one-third of this accounted for by FDI-related firms.

The extensive market penetration of foreign companies – mainly from the EU – has contributed significantly to transforming and modernising local markets, particularly as regards retail trade, though starting from different points in time in individual countries of the NMS (A.T. Kearney Global Retail Development Index (2004, 2007 and 2010), Dries et al. (2004) and Deloitte (2008)). Grocery retailing is one of the markets that has experienced the most profound changes in terms of expansion of modern formats. The trend towards a decline in the importance of traditional small shops (as evident in some of the more mature markets, such as that of the Czech Republic) indicates that a continuing modernisation of distribution channels in

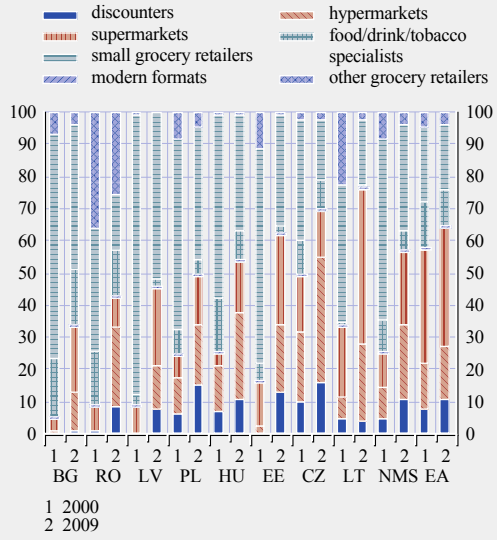
Chart B Share of sectoral turnover accounted for by foreign-controlled firms



Source: Eurostat SBS database.
Notes: NMS excludes Poland owing to data limitations; "EA" refers to the euro area, but includes only Spain, Italy, Portugal, Slovenia, Slovakia and France because of data limitations.

Chart C Development of modern retail formats in NMS grocery retail markets

(percentages)



Sources: Euromonitor and own calculations.
Note: "EA" refers to the euro area.

2 The choice of period is subject to data availability.

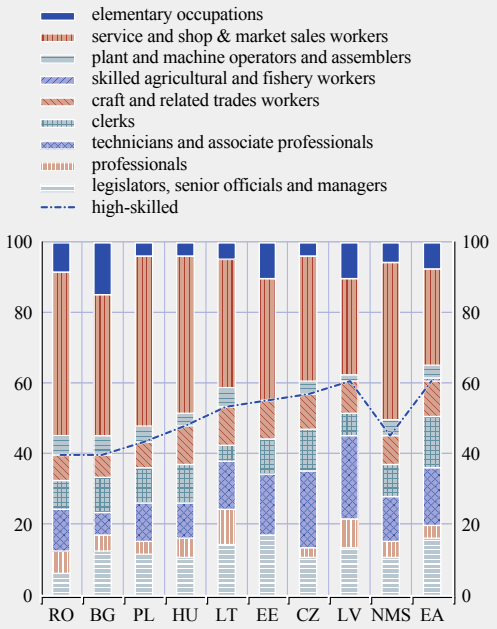
Bulgaria and Romania is to be expected in the coming years, possibly linked to a further increase in competition from multinational chains (see Chart C).

Labour market characteristics

The distributive trades sector has played a significant role in job creation in the NMS in the transition process, generating an increasing share of total employment. In 2007 the sector's share of overall employment ranged from around 11% in Romania to around 19% in Lithuania. Similar to euro area countries, retail trade is a larger employer than the wholesale and the motor and fuel sub-sectors. An important feature regarding the NMS, albeit one varying in terms of speed, has been the growing share of total employment in the distributive trades sector accounted for by foreign-controlled enterprises. In 2007 this share ranged from slightly above 10% in Poland and Romania to about 20% in Hungary and Latvia.

Chart D Skill composition of employment in the distributive trades sector in 2009

(percentage of persons employed)



Sources: Eurostat Labour Force Survey and own calculations.
Note: Data are missing for Estonia.

In terms of the employment structure, developments in the NMS share certain similarities with those observed in the old Member States. In general, the average age of those employed is lower than that for the whole economy and the share of women working in the sector is relatively higher than that for the entire labour force. The generally higher proportion of skilled occupations in the sector for the euro area and some of the more mature NMS markets possibly indicates that, with the more widespread use of automated work processes, a similar trend towards more skilled labour in the sectoral employment composition is likely to occur in countries such as Romania and Bulgaria (see Chart D).

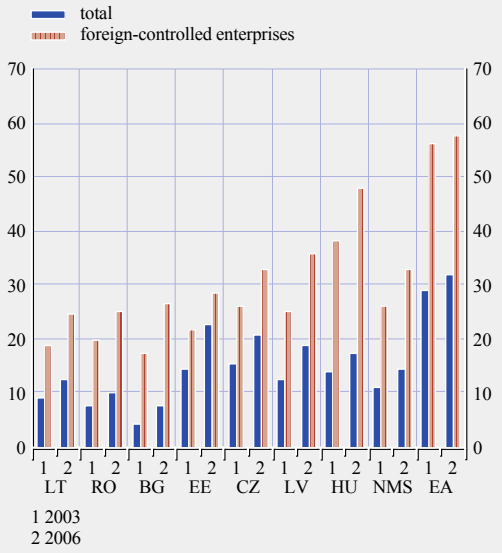
MARKET STRUCTURE AND IMPACT ON PRICE DEVELOPMENTS

Concentration and productivity

Retail markets in the NMS are in an ongoing process of concentration; a fact which is evident from the increasing share of turnover attributed to the top 1% of firms and, more specifically, the rising market share of the leading five grocery retail companies. In addition, an increase in food retail surface area has been associated with both a larger number of individual stores and a bigger average store size (Bukeviciute et al. (2009)).

Market concentration appears to have improved efficiency, since labour productivity in the distributive trades, as a whole, increased from 2003 to 2006, especially in Estonia, Latvia and

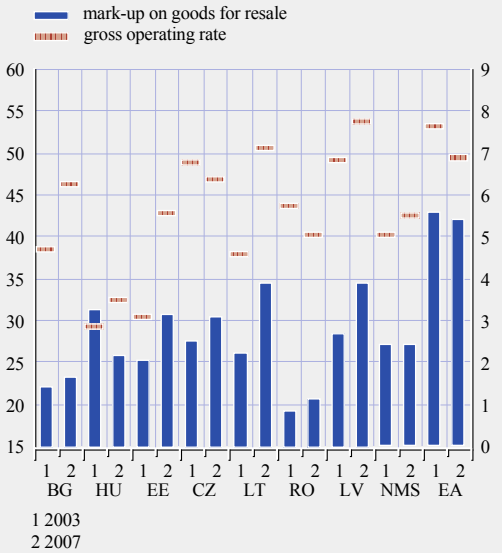
Chart E Labour productivity in the distributive trades sector



Source: Eurostat SBS database and own calculations.
Notes: NMS excludes Poland owing to data limitations; "EA" refers to the euro area, but includes only Spain, Italy, Portugal, Slovenia, Slovakia and Finland owing to data limitations. Labour productivity is defined as valued added at factor cost per person employed (in thousands of euro), adjusted for cross-country price level differences using Eurostat data related to comparative price level indices for consumer goods.

Chart F Gross operating rate and resale mark-up in the retail sub-sector

(percentages)



Source: Eurostat SBS database and own calculations.
Notes: NMS excludes Poland and "EA" refers to the euro area, but excludes Malta owing to data limitations. Mark-up on goods for resale = gross margin on goods for resale/(purchases of goods for resale – change in stocks of goods for resale). Gross operating rate = gross operating surplus/turnover.

Bulgaria. Productivity growth has also been strongly boosted by FDI, as the productivity levels achieved in foreign-controlled firms have been, by far, superior to the respective levels for the whole sector in all NMS (see Chart E).

A strong increase in profitability in the retail trade sub-sector was observed in Estonia, Lithuania, Bulgaria and Latvia (see Chart F).[3] The trend of rising profitability has, in general, narrowed differences in the gross operating rates of countries and, in most cases, brought them closer to the average value for the euro area of about 7%. These developments seem to suggest that the observed growth in profitability could be interpreted as being efficiency-based and not necessarily a reflection of increasing market power due to intensifying concentration.

Impact on price developments

Regardless of whether or not it was moving in parallel with the gross operating rate, the resale mark-up in the retail trade market increased in most countries in the period from 2003 to 2007, albeit to a different extent in individual cases (see Chart F).[4] An exception is Hungary, where resale mark-ups declined, and this accounted for the relatively stabile nature of the indicator for the NMS as a whole. The heterogeneity in mark-up rates may be due to differences in supply

3 Profitability is measured by the gross operating rate. For the purposes of this box, it has not been adjusted for the implicit labour income of the self-employed.
4 The resale mark-up is estimated as follows: *mark-up on goods for resale* = gross margin on goods for resale/(purchases of goods for resale – change in stocks of goods for resale).

chains, relationships with service providers, subcontractors, etc. Hence, it is difficult to tell whether resale mark-up dynamics alone can explain inflation developments in these countries. Whilst rising mark-up rates may be one of the driving factors behind inflation in the Baltic countries, in the case of Bulgaria, inflation rates were elevated despite modest mark-up rates. It is also hard to disentangle developments in the structure of retail markets and in mark-ups from other conjunctural or fundamental factors, such as the business cycle, the input cost structure relating to production, the labour market, convergence processes, etc.

The empirical evidence on the implications of retail pricing policies for consumer prices in the NMS is rather limited. Podpiera and Raková (2008) find that, in the Czech Republic, the increasing number of stores in the fast-moving consumer goods market over the period 2000 to 2005 resulted in prices declining, on average, by 0.8 percentage point a year. In contrast, they expect the strengthening of the consolidation processes will lead to overall inflation increasing by 0.5 percentage point a year by 2020. When examining the functioning of the food supply chain, Bukeviciute et al. (2009) indicate that the lack of sufficient competitive pressures at the retail level could be one of the factors behind the higher price increases in NMS, compared with the euro area. The authors argue that consolidation processes may be associated with efficiency gains and result in lower prices, but emphasise that increasing concentration could also lead to anti-competitive developments and price increases. In the case of the NMS, the authors find that the growing number of retail stores had a certain dampening effect on consumer food prices in the period from 2003 to 2007.

In conclusion, the distributive trades sector has been of increasing importance to the economies of the NMS, playing a significant role in job creation during the transition process. Prompted by the accession of these countries to the EU and their growth prospects, FDI has been instrumental in the fast development and modernisation of this sector. FDI has contributed strongly to enhancing productivity in all countries. At present, NMS retail markets are in an ongoing process of consolidation which, in most cases, has been accompanied by a general trend of increasing profitability. This has led to a narrowing of profitability differentials and has pushed profit levels closer to the average for the euro area. Although resale mark-ups in the retail sub-sector have been on the rise in most countries, the possible implications of these developments for overall inflation at an aggregate level are hard to disentangle from specific local factors as well as from other factors, such as the business cycle and convergence processes. Nonetheless, looking forward, given the ongoing trend towards consolidation, it is imperative that policymakers ensure adequate competition and "smart" regulation to minimise inflationary tendencies.

2 THE IMPACT OF STRUCTURAL FEATURES ON PRICE LEVELS, PRICE-SETTING BEHAVIOUR, REGIONAL PRICE DYNAMICS AND PASS-THROUGH

2.1 THE IMPACT OF STRUCTURAL FEATURES ON PRICE LEVEL DIFFERENCES

The aim of this section is threefold: (1) to provide a descriptive overview of price level differences across the euro area in terms of their magnitude and characteristics across countries and products; (2) to examine the degree of convergence or otherwise in price levels; and (3) to combine information on the structural aspects of the retail sub-sector with other indicators in order to assess the extent to which these structural aspects help us to understand price level differences and convergence.

The main findings are as follows. (1) There remains a considerable degree of price dispersion across the euro area. Whilst this is lower, on average, for goods than for services, it is still sizeable in most cases – it tends to be lower for electronics and for clothing and footwear goods but higher for food products. (2) Even though different measures suggest differing degrees of convergence, it seems that a limited degree of convergence has indeed taken place, but that this came to a halt around the period 2004 to 2006. (3) There is compelling evidence of a strong "border effect" across euro area countries, which suggests ample scope for further improving the Single Market. (4) Even after controlling for factors such as income levels and VAT rates, the structural and regulatory features of the distributive trades sector appear to play a role in explaining differences in price levels across countries.

2.1.1 INTRODUCTION AND MOTIVATION

There have been numerous studies of price level differences and dispersion in Europe, but the evidence about the link between cross-country price differentials and the structural features of the distributive trades sector is scarce.

Faber and Stokman (2009) consider price level convergence at an aggregated level by combining overall HICP/CPI and PPP data over a long time period (from 1960 to 2003) as well as at a slightly more disaggregated level[81] over a shorter time period (from 1980 to 2003). They find evidence of price level convergence in Europe over a long period of 40 to 50 years, which they attribute to the harmonisation of indirect taxes and to non-traded and traded input costs (via exchange rates and economic openness). They also find that price level dispersion in the United States over the same period was broadly stable; at a level that was only reached in the EU towards the end of their sample period in 2003. They also "note that price level dispersion between the EMU countries already converged close to that in the United States before the introduction of the euro", perhaps implying that further substantial progress in price convergence could not be expected.

Similarly, in a comprehensive study of the impact of the euro on prices, Sturm et al. (2009) conclude that "overall, the results from the literature are fairly conclusive. There is generally little evidence that price levels among EMU member countries have converged due to the introduction of a common currency. For one thing, price dispersion among EMU member countries was already disproportionately low at the time when the euro was adopted." In their own analysis, they also argue that there is not much evidence in favour of price convergence in the post-EMU period, despite there being some convergence for specific products. Similarly, the Deutsche Bundesbank (2009) has also investigated price convergence in the euro area in the first decade of EMU, concluding that "the empirical findings point, at most, to a marginal convergence of prices as an underlying trend".[82]

81 They looked at seven sub-components: food, alcoholic beverages and tobacco, clothing and footwear, housing, furnishings, transport and communications, and recreation and culture.

82 Berka and Devereux (2010) also combine PPP data with HICP data to study price level convergence. They find that price dispersion is higher for non-tradables than tradables. They report little or no convergence for euro area countries but some for new Member States.

In terms of the determinants of price differences, Berka and Devereux (2010) argue that real exchange rates are very closely tied to relative GDP per capita within Europe, both across countries and over time. In this regard, Andersson et al. (2009) also find that price level differences are a function of GDP per capita, whilst arguing that inflation differences are a function of the business cycle and persistence and that the latter is, in turn, a function of administered prices and product market regulation.

At a more sectoral and micro level, there have been a number of studies that have looked at the structural features of the distributive trades sector and their impact on price levels, pricing behaviour and inflation. However, many of these have been country-specific.[83] In Italy, Schivardi and Viviano (2010), in a study of regional data, find that entry barriers are associated with substantially larger profit margins and lower productivity on the part of existing incumbent firms. In areas with more stringent market entry regulation, lower productivity coupled with larger margins results in higher consumer prices. For Spain, Matea and Mora (2009) find that an increase in the level of regulation at the regional level increases inflation and also diminishes employment in the retail trades.[84] In Finland, Kotilainen et al. (2010) have found that VAT and cost disadvantages, such as a northern location and low population density, were significant factors behind higher prices here.[85]

In a recent study, the European Commission (2010) highlighted considerable price differences within the internal market, prompting the suggestion that the internal market is still fragmented. For example, the Commission noted that the price of food and non-alcoholic beverages is, on average, 28.4% higher in Belgium than in the Netherlands, and that for certain common retail pharmaceutical products, the price difference can reach a factor of one to five. On the other hand, with regard to the clothing retail market, the Commission commented that "it is surprising to note that prices in Ireland, France and the United Kingdom are below the EU average whilst those in the Czech Republic and Slovakia are considerably higher than average". This suggests that several factors, such as differences in average household disposable income or VAT, explain certain price differences, whilst other factors related to competition, the regulatory framework or commercial practices (e.g. territorial supply constraints or obstacles to parallel trade), also play a role. However, the comparability of price level data is sometimes questioned.

Before trying to assess the impact of the structural features of the distributive trades sector on price level differences across euro area countries, there is first a descriptive analysis of price dispersion.

2.1.2 THE DEGREE OF PRICE DISPERSION AND CONVERGENCE

This section analyses the pattern of price dispersion over the past decade for a set of consumer prices and investigates the degree, if any, of convergence. More specifically, it uses data containing information on relative price levels for a detailed set of products made available from Eurostat's PPP database and derives simple statistics of convergence for these products. This analysis provides a first impression of the extent to which price convergence prevails across countries and classes of products, such as tradables and non-tradables. A number of different indicators

83 A notable exception is Francois et al. (2008) who study the pass-through from producer and import prices across a range of consumer goods products and countries, finding "significant interaction between various measures of retail structure and the rate of pass-through".

84 In Finland, Rantala (2007) measures competition using the price cost margin and the Boone competition indicators discussed in Chapter 1.3 and shows that competition in the Finnish private service sectors is roughly equal to competition in other EU and OECD countries. Thus, it is argued that the high consumer price level in Finland cannot be explained by the lack of competition in the Finnish service sectors. As regards Spain, Hoffmeister (2009) argues that "price convergence emerges in Spain once regional barriers to entry have been accounted for". However, it should be noted that this study looks at inflation rather than price levels.

85 They suggest that the most important reasons why the consumer price level is higher in Finland than in other EU countries are the high level of housing prices and value added and other product tax rates in this country.

Table 10 Minimum and maximum (post-tax) price levels for different product categories in the euro area in 2009

(euro area = 100; "cc" denotes country)

	Min. (cc)		Max. (cc)		Max./min. (%)	Rank
0 Overall consumption	**62.4**	**SK**	**122.9**	**IE**	**97.1**	**22**
1 Food/non-alcoholic drink	76.2	SK	120.6	IE	58.2	13
2 Alcoholic drink/tobacco	77.2	ES	184.4	IE	139.0	26
3 Clothing/footwear	88.1	MT	118.7	FI	34.7	5
5 Household goods	85.6	SK	111.4	LU	30.1	2
9 Recreation/culture	65.6	SK	115.8	FI	76.5	18
9.1 Electronic equipment	92.4	LU	106.2	CY	15.0	1
12 Misc. goods/services	61.0	SK	124.7	IE	104.6	24

Sources: Eurostat PPP database and Eurosystem staff calculations.
Note: "Rank" refers to the ranking across the 32 available product categories of the range between the maximum and minimum price levels.

(beta and sigma) of convergence are calculated using both raw PPP data as well as the HICP interpolated using PPP data.

Table 10 uses PPP data to provide an overview of the degree of price dispersion (in terms of the maximum and minimum relative price levels) across the euro area in 2009 for some of the Classification of Individual Consumption by Purpose (COICOP) publicly available groups.[86] Despite the fact that the degree of price dispersion in the euro area was already relatively low at the launch of EMU, it is clear that a substantial amount of dispersion remains. For overall private consumption, price levels varied by almost 100% from the lowest (62.4 in Slovakia) to the highest (122.9 in Ireland) registered, relative to the euro area average of 100.

At the relatively aggregated two-digit COICOP level, the lowest gap between minimum and maximum price levels across the euro area was for the household goods group (5), with a difference of 30% between the lowest (85.6 in Slovakia) and highest (111.4 in Luxembourg) levels. The gap is largest for the alcoholic drink and tobacco group (2), at 140% – presumably driven in large part by taxation differences – with a gap of 100% for alcoholic beverages and one of over 200% for tobacco. In terms of the more detailed sub-groups available, the one with the lowest variation was electronic equipment[87] (9.1), with a difference of just 15% between the lowest (92.4 in Luxembourg) and the highest (106.2 in Cyprus) price levels. Relatively low differences were also observed for the clothing and footwear group (3) – see the box in Section 2.4 for a more detailed discussion of clothing and footwear prices and their evolution. For overall food prices, the gap between the highest and lowest price levels was almost 60%.

Before considering in more detail the degree of dispersion in price levels across the euro area, it should be noted that a number of technical aspects are discussed in the Appendix, for example, how to measure price dispersion and convergence and which measure, if any, is "best", and how PPP and HICP data are merged so as to optimally combine the cross-product and cross-time properties of both datasets.

When all of the 146 available PPP series are considered individually there is a considerable degree of volatility within and across these series over time and, generally, a substantial amount of heterogeneity. In some cases dispersion appears to have fallen, risen in others and, in many cases, no clear trend is evident. Nevertheless, when the data are aggregated, a number of patterns emerge, as demonstrated in Chart 13. First, as would be expected a priori, the degree of dispersion (as measured by the coefficient of variation) was on average lower for goods (slightly below 15 in 2009) than for services (slightly above 20 in 2009) over the period covered by the sample (1995 to 2009). It should be noted that goods

86 Table A14 in the Appendix provides detailed country numbers.
87 This refers to audio-visual, photographic and information processing equipment.

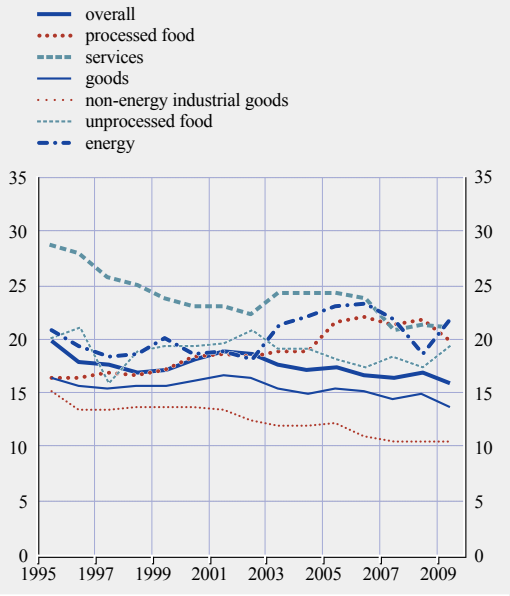
prices also include a non-traded element related to the retail intermediation service involved. The lowest price dispersion is observed for non-energy industrial goods (i.e. non-food, non-energy consumer goods), at slightly above 10 in 2009; the highest for services. Whilst the dispersion of services prices was, on average, the highest registered, after 2006, the dispersion of processed food prices and energy prices stood at about the same level. Second, for consumer prices, in general, and for the prices of non-energy industrial goods and services, in particular, the degree of dispersion has fallen on average over the past 15 years. However, in respect of processed foods (and to a lesser extent energy goods), it has risen since the second half of the 2000s, whilst remaining broadly constant for unprocessed foods. Lastly, as regards the general pattern over time, the overall degree of price dispersion seemed to decline slightly between 1995 and 1998 and increase somewhat between 1998 and 2001, before easing thereafter to reach a minimum in 2009.

However, as discussed further in the Appendix, some caution is needed when interpreting Chart 13 owing to certain issues relating to both the measurement of price dispersion over time and the use of PPP data.[88]

Chart 14 shows both the coefficient of variation and the standard deviation using pseudo price level data (PPLD) constructed by merging HICP and PPP data – see Box 3 in the Appendix for a more detailed explanation. Considering first the coefficient of variation, the pattern observed in

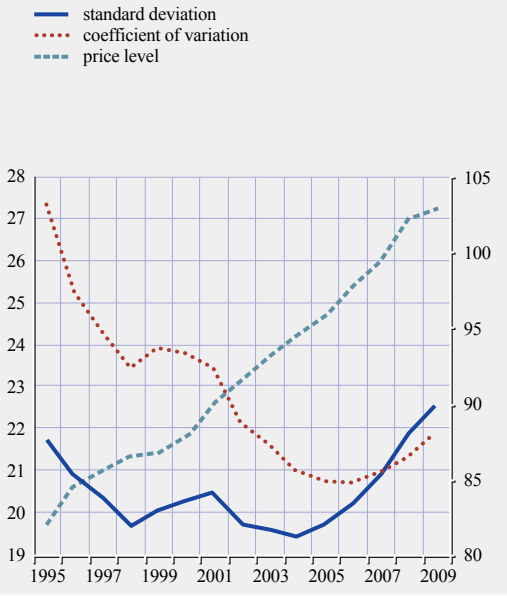
88 Firstly, caution must be exercised because the coefficient of variation might be biased towards showing convergence if the price level is increasing over time. As euro area inflation has averaged slightly below 2% over the past 15 years, the average consumer price level has risen by over one-third. Thus, if the differences in price levels were to be constant in absolute terms (i.e. the standard deviation would be constant) the coefficient of variation would decline by 25% (1/1.333). With regard to the time series properties of PPP data, methodological improvements are continuously being made in these data, thereby introducing a potential bias towards price convergence if harmonisation across countries leads to lower price dispersion.

Chart 13 Evolution of the coefficient of variation across special aggregates using PPP data



Sources: Eurostat PPP dataset and Eurosystem staff calculations.

Chart 14 Price dispersion (standard deviation and coefficient of variation) using pseudo price level data



Sources: Eurostat PPP dataset and Eurosystem staff calculations.
Note: PPLD combine national HICPs with relative price level indices obtained from PPP data.

Chart 14 is somewhat different from that seen earlier in Chart 13. Using the merged HICP/PPP data, the decline in the coefficient of variation is more evident, with there being two distinct phases, i.e. the period between 1995 and 1998 and that between 2001 and 2006. However, since 2006 there has been an apparent increase in the degree of price dispersion.

Second, as concerns the standard deviation, although there are some similarities, such as the declines observed between 1995 and 1998 and after 2001, the pattern is substantially different to that of the coefficient of variation. In particular, the decline in price dispersion seen between 1995 and 2004 was relatively modest and dispersion increased noticeably after 2004.

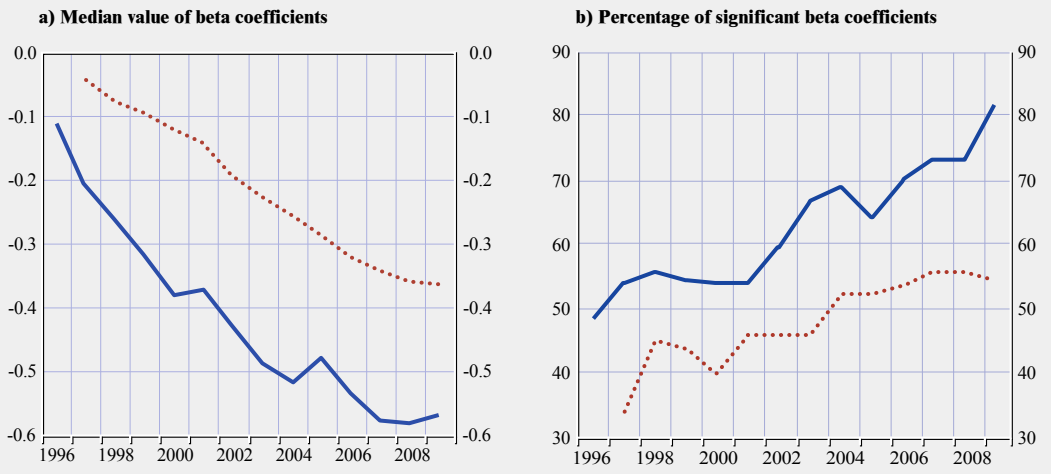
Cross-checking the two measures would suggest that some price convergence took place between 1995 and 1998 and between 2001 and 2004. However, both these measures would also suggest that price dispersion increased in the second half of the 2000s – a fact that is worrying from a monetary policy perspective and which may warrant further investigation.

Finally, Charts 15(a) and 15(b) provide two alternative examples of so-called "beta convergence": the former presents the median beta coefficient estimated across the 146 series in respect of relative price level indices (RPLIs) obtained from raw PPP data and 89 series in respect of PPLD (i.e. combined HICP/PPP data), whereas the latter shows the percentage of statistically significant beta coefficients obtained when using both sets of data. In both charts, the degree of beta convergence appears to have increased over time, being somewhat stronger in the case of RPLI data than when PPLD are used. This may be owing to a number of factors. First, as mentioned above, the PPP methodology is being continuously refined and this may give rise to apparent convergence, when in fact it is merely a more accurate comparison of price levels across countries. Second, it may be that price convergence is more evident at more disaggregated levels of data. For example, when using the RPLI data, there are thirty series for food, whereas for PPLD, there are nine series for food. Sturm et al. (2009) argue that, at an aggregate level, there is little or no evidence of price convergence but, at a more

Chart 15 Evidence of beta convergence

(percentages)

RPLI
PPLD



Sources: Eurostat HICP and PPP databases and Eurosystem staff calculations.

detailed level, there is indeed some evidence of price convergence for certain products. It may be the case that convergence makes most sense and that this should thus be assessed at the most disaggregated level possible.

2.1.3 IS THERE A "BORDER EFFECT" ON PRICES?

In this section very detailed product-level data from the PPP dataset are used to analyse whether prices differ more within countries or across countries – the so-called "border effect". The term "border effect" refers to the fact that price dispersion tends to be higher between cities across borders than between cities within borders. Whilst there has been an extensive and rich literature on this topic (e.g. Bergin and Glick (2006), Crucini et al. (2005), Parsley and Wei (2001), and Engel and Rogers (1996)), this effect has not yet been studied with regard to euro area countries using PPP data.[89]

Assessing the existence of a border effect is possible using data from "Quaranta tables",[90] which are compiled both at the basic heading (146 consumption items) and product heading (over 2,500 items) levels. At the product level, the Quaranta tables contain the following:

- Price-related information for each product in each country/city – the average price recorded, the number of price observations recorded, and the coefficient of variation of the prices recorded.

- Information on whether each product is: (i) a specified brand; (ii) a non-specified but "well-known" brand; or (iii) without a brand – goods without a brand label or with a "pseudo" brand label that is "meaningless" to consumers or where "brand" is not a relevant term, such as in the case of fresh meat or fish.

Thus, these data allow us to ascertain whether prices vary more across countries than within countries and this may also be linked to whether the product is a specified international brand or a brandless product. This may be relevant in the context of the discussion in Section 1.1 on private label brands and the relative bargaining power of producers and retailers. Whilst there are some caveats with regard to the use of these data, as will be discussed below, the findings are quite robust, even when these are kept in mind.[91]

Chart 16a shows the median *dispersion of individual price observations within countries/cities* as well as the *dispersion in respect of average prices across countries/cities* for 356 food and non-alcoholic beverage products.[92] On average, the degree of dispersion regarding average prices across countries/cities is substantially higher than the degree of dispersion for individual observations within countries/cities: the medians are 0.25 and 0.15, respectively – see Table 11. Also, the dispersion regarding products is higher: the inter-quartile range across countries is 0.12 compared with 0.06 within countries and the lower quartile product dispersion is 0.20 across countries compared with 0.12 within countries.

Chart 16b demonstrates that the degree of dispersion is also a function of the "degree of branding" but is still always lower within countries/cities than across countries/cities. The median dispersion across products *within*

89 Ratfai and Reiff (2010) make a comparison across the Hungarian-Slovakian border, arguing that it has virtually no effect.

90 These tables were originally developed as a means of validating raw price data and for quality control, and are named after their originator, Vincenzo Quaranta of the Italian National Institute of Statistics (ISTAT), who first proposed them to the Eurostat Working Party on Price Statistics in January 1990. They were subsequently described in "A data quality control approach in price surveys for PPP estimates" by Quaranta, which was published in *Improving the Quality of Price Indices: CPI and PPP*, Eurostat and University of Florence, Luxembourg, 1996.

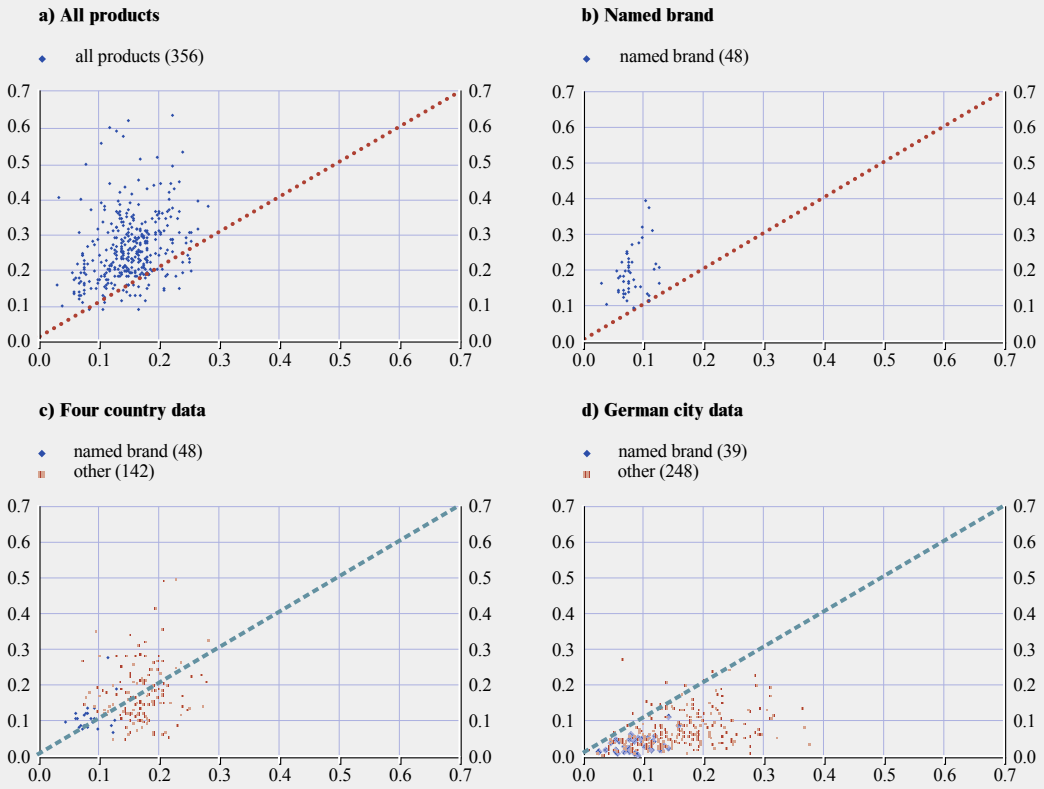
91 The main caveat is that it is not possible to extract the coefficient of variation of all observations across all countries; it is only possible to observe the *coefficient of variation of the individual observations recorded within a country/city* and the *coefficient of variation of the average prices observed across countries*. However, a priori, one would expect the coefficient of variation of a sample average (i.e. the average prices observed) to be lower than the coefficient of variation of the raw data (the individual price observations). Therefore, if the coefficient of variation across countries is higher than that within countries, it strongly suggests the presence of the so-called "border effect".

92 Data are actually available for 496 food and non-alcoholic beverage products, though not for all products across all countries. Therefore, in order to ensure comparability across countries, data are restricted to those products for which more than one price observation is available for at least eight countries (i.e. the said 356 products).

Chart 16 Use of detailed product-level data from PPPs to assess the existence of a border effect for food, beverages and tobacco prices

(coefficient of variation)

x-axis: within countries (cities)
y-axis: across countries (cities)



Sources: Eurostat PPP database and Eurosystem staff calculations.

countries/cities is 0.08 for "named" brands, 0.15 for "well-known" brands and 0.17 for "brandless" products, whereas it is higher *across countries/cities* at 0.20, 0.25 and 0.29, respectively.[93] Given the potential importance of the interaction between upstream (producers) and downstream (retailers) agents in determining consumer prices (as discussed in Chapter 1), the finding of lower dispersion for "named" brands may warrant further investigation.

Chart 16a presents compelling evidence of the existence of a border effect. Nonetheless, it could be argued that this effect captures the impact of geographical distance rather than that of national borders. To assess this, it is helpful to take advantage of the fact that PPP data are available for a number of German cities (i.e. Berlin, Bonn, Karlsruhe and Munich)[94] and carry out a robustness check by comparing price level differences between these German cities and those between comparable capital cities in different countries. First, price dispersion is calculated for the four countries whose capital cities (for which raw PPP data are collected) are,

93 However, two points should be noted with regard to this analysis based on branding. First, it does not say anything about price levels. It might be that branded goods have higher mark-ups as a result of product differentiation and pricing power. Second, it may reflect statistical factors, in that it may simply indicate that it is easier to compare prices both across countries and within cities if a specified brand name is involved.

94 These cities are relatively diverse geographically and demographically. The distance between these four German cities ranges from around 300 km to about 700 km, with the average distance being 500 km (all by car and using main roads).

Table 11 Price dispersion across and within countries/cities

	Across countries/cities				Within countries/cities			
Euro area	All	NB	WKB	BL	All	NB	WKB	BL
Lower quartile	*0.20*	*0.16*	*0.20*	*0.21*	*0.12*	*0.07*	*0.13*	*0.15*
Median	0.25	0.20	0.25	0.29	0.15	0.08	0.15	0.17
Upper quartile	*0.32*	*0.25*	*0.32*	*0.35*	*0.18*	*0.10*	*0.18*	*0.21*
Inter-quartile range	0.12	0.09	0.12	0.13	0.06	0.03	0.05	0.06
	Across cities				Within cities			
Germany	All	NB		other	All	NB		other
Lower quartile	*0.03*	*0.02*		*0.03*	*0.10*	*0.07*		*0.11*
Median	0.05	0.02		0.05	0.13	0.08		0.15
Upper quartile	*0.08*	*0.05*		*0.09*	*0.19*	*0.12*		*0.20*
Inter-quartile range	0.06	0.03		0.06	0.10	0.05		0.09
	Across countries/cities				Within countries/cities			
Four countries	All	NB		other	All	NB		other
Lower quartile	*0.11*	*0.09*		*0.12*	*0.12*	*0.07*		*0.15*
Median	0.15	0.11		0.16	0.17	0.08		0.18
Upper quartile	*0.21*	*0.12*		*0.22*	*0.20*	*0.10*		*0.20*
Inter-quartile range	0.10	0.04		0.10	0.07	0.03		0.05

Note: "NB", "WKB" and "BL" denote named brand, well-known brand and brandless products respectively.

broadly speaking, less heterogeneous in terms of distance and population.[95] These countries are Belgium, France, Luxembourg and the Netherlands.[96] The average distance between their capital cities is 330 km, which is actually substantially below the average distance between the four German cities. It should be noted that these four countries are also relatively homogenous in terms of their economic structure and relatively high living standards. Although their capital cities are geographically closer than the German cities, Chart 16c shows that price dispersion across these four countries (at 0.15) is substantially above that across the German cities (0.05) – see Chart 16d – but lower than the dispersion across all euro area countries (0.25). Thus, whilst price dispersion is due, in part, to geographical distance, there is also clearly a national border effect.

The results for the German cities shown in Chart 16d underline the fact that, ceteris paribus, the dispersion of sample averages is lower than the dispersion of individual observations and thus provides more robust evidence of a strong border effect within the euro area. From Chart 16d it is quite striking (especially when compared with Charts 16a and 16c) that the degree of dispersion of average prices across German cities is lower on average than the degree of dispersion of individual prices within German cities. The median across cities is 0.05, whereas the median within cities is 0.13 – this is completely the opposite of what has been observed across countries. In addition, as with the results for the euro area, dispersion is much lower for "named" brands than for "well-known" or "brandless" products, both across and within cities.

In summary, thus far it has been shown that: (a) despite some evidence of convergence in euro area consumer prices over the past 15 years, considerable dispersion remains; and (b) despite the existence of a common currency since 1999, there appears to be a sizeable and significant border effect, with the result that price dispersion across countries is higher than that within countries. Thus, it is important also to consider what factors may have been behind this and what role, if any, has been played by the structural features of the distributive trades sector.

95 The four German cities are generally similarly heterogeneous, both in terms of geographic distance and in terms of population.

96 The populations of the respective capital cities are: Brussels (1.1 to 1.8 million), Paris (2.2 to 11.8 million), city of Luxembourg (90,000) and Amsterdam (800,000 to 2.2 million).

2.1.4 THE IMPACT OF THE STRUCTURAL FEATURES OF THE DISTRIBUTIVE TRADES SECTOR

This section first draws on the existing literature, discussed above, modelling price level differences across countries to construct a benchmark model. Thereafter, the benchmark model is augmented with indicators of the structural features of the distributive trades sector in order to discover whether these features of the sector itself can help to explain price differentials across countries. This benchmark model draws on different strands of the literature.

Firstly, by far the most common element in this literature is the hypothesised link between price levels and living standards, which is usually prompted by the Balassa-Samuelson type of argument. Under this way of thinking, high living standards are driven to a large extent by strong productivity in the traded goods sector. Within this context, and given broadly constant wages differentials across the traded and non-traded goods sectors, price levels, especially in respect of the non-traded goods sector, are pushed up. Therefore, *relative real GDP per capita* is included in the benchmark model.[97]

Secondly, although there has been some degree of harmonisation of indirect taxes in the EU, some differences remain across countries. Therefore, *VAT rates* are included in the benchmark model. To do so, the VAT bands (zero, reduced or standard) now generally used have been applied to each of the 146 series available to us from the PPP dataset. A time series of the different rates used within each band (zero, reduced and standard) has also been constructed that goes back to 1995.[98]

Thirdly, drawing on the "rational inattention" literature, the *relative expenditure share* of a specific product in a country relative to the euro area average is added to capture the expenditure intensity and presumably "attention intensity" for each product. For example, if Italian households consume proportionally more pasta than households in other countries, presumably they will invest more effort in searching and comparing the prices of pasta products. Thus, other things being equal, (and perhaps being helped by scale and competition effects) prices for pasta should be lower in Italy. Finally, *population density* is included as a control for potential efficiencies driven by high/low population density.

Notes: t-statistics are in parentheses; "PLI" denotes the relative price level index (country, product group and time); "rgdppcr" denotes relative GDP per capita (country and time);[99] "vatrate" denotes the VAT rate (country, product group and time); "expsr" denotes the share of expenditure on a product relative to the euro area average (country, product group and time); "dens" denotes population density (country and time); "emhhi" denotes the HHI from Euromonitor relating to average data for the period 2004 to 2009 (country and sector-specific); "emc5" denotes the CR5 indicator from Euromonitor relating to average data from the period 2004 to 2009 (country and sector-specific); "sbsm2" denotes the profit margin adjusted for the implicit labour income of the self-employed; "pmrr" denotes the OECD PMR indicator for the whole retail sector (country and time – interpolated); "pmrrbe" denotes the OECD retail sector PMR indicator relating to barriers to entry (country and time); "pmrrpc" denotes the OECD retail sector PMR indicator relating to price controls (country and time); "pmrror" denotes the OECD retail sector PMR indicator relating to operating restrictions (country and time); and "epl" denotes the OECD employment protection indicator relative to the euro area average (country and time).

A panel equation is estimated pooling the data across both products and countries, including fixed effects for products and countries. The results of the baseline model – see column

97 As a robustness check, relative real gross national income (GNI) per capita is also used, as in some countries (most notably Ireland and Luxembourg) GDP per capita which is much higher than GNI per capita, may be distorted.

98 For the sake of tractability, it has been assumed that products do not move from one band to another. This assumption is not expected to have a material impact on the results.

99 The model was also run with relative real GNI per capita with broadly similar results.

(a) in Table 12 – are very much in line with a priori expectations.[100] Relative income levels (rgdppcr) and VAT rates (vatrate) have a positive and significant impact on relative price levels.[101] Expenditure intensity (expsr) has a negative and significant impact on price levels – suggesting that either higher attention or scale effects have an impact on price levels. Population density (dens) also has a negative and significant impact on price levels.[102]

The benchmark model is then augmented with variables capturing the structural features of the distributive trades sector. Three broad categories of variables were tested capturing: (a) market concentration; (b) profitability; and (c) regulation. It should be noted that, as developments were

100 The model was also estimated so that it allowed for heterogeneity, but this did not give rise to any substantial change in the results. In addition, the baseline model was estimated using only goods – i.e. retailed products – and the results remained similar, with one exception: as expected, the coefficient on relative GDP per capita decreased substantially (to 0.14) but remained statistically significant. In contrast, when the model was run using only products related to services, the coefficient increased significantly to 0.46, again, as expected.

101 Note: excise taxes may also have an important impact, in particular those related to alcohol, tobacco and petroleum products. These have not yet been controlled for. However, it was checked whether the results are robust by excluding these items, and this certainly appears to be the case. Nonetheless, further precision might be achieved in the estimates by including excise taxes, i.e. provided suitable time series can be obtained.

102 Some additional robustness tests were performed. First, when only goods were included in the sample, the results remained similar, with one exception: as expected, the coefficient on relative GDP per capita decreased substantially. The model was also estimated by grouping by country rather than by product and without product fixed effects; the results of the baseline model remained robust.

Table 12 Estimation results for the PLI dependent variable

	a	b	c	d	e	f
rgdppcr	0.25	0.15	0.15	0.25	0.14	0.14
t-stat	*(11.32)*	*(5.80)*	*(5.86)*	*(10.92)*	*(5.42)*	*(5.40)*
vatrate	0.35	0.42	0.49	0.35	0.42	0.49
t-stat	*(8.24)*	*(7.48)*	*(8.99)*	*(8.28)*	*(7.45)*	*(8.95)*
expsr	-0.27	-0.95	-1.01	-0.27	-0.94	-1.00
t-stat	*(-2.95)*	*(-4.44)*	*(-4.70)*	*(-2.90)*	*(-4.41)*	*(-4.67)*
dens	-0.14	-0.12	-0.12	-0.15	-0.13	-0.14
t-stat	*(-5.74)*	*(-4.09)*	*(-4.08)*	*(-5.15)*	*(-4.25)*	*(-4.38)*
emhhi * 100	-	-0.40	-	-	-0.40	-
t-stat		*(-7.25)*			*(-7.26)*	
emc5	-	0.15	-	-	0.15	-
t-stat		*(6.68)*			*(6.69)*	
sbsm2	-	-	0.46	-	-	0.46
t-stat			*(3.49)*			*(3.49)*
pmrrbe	-	-	-	1.20	0.98	1.01
t-stat				*(4.83)*	*(3.44)*	*(3.55)*
pmrrpc	-	-	-	-0.60	-0.62	-0.70
t-stat				*(-3.33)*	*(-3.01)*	*(-3.41)*
pmrror	-	-	-	-0.10	-	-
t-stat				*(-0.40)*		
epl	-	-	-	-1.83	-2.04	-2.19
t-stat				*(-5.62)*	*(-5.48)*	*(-5.91)*
R2	0.19	0.15	0.14	0.19	0.15	0.14
N. Obs	23,925	14,580	14,580	23,925	14,850	14,850
N. Groups	145	90	90	145	90	90

Notes: t-statistics are in parentheses; "PLI" denotes the relative price level index (country, product group and time); "rgdppcr" denotes relative GDP per capita (country and time)[1]; "vatrate" denotes the VAT rate (country, product group and time); "expsr" denotes the share of expenditure on a product relative to the euro area average (country, product group and time); "dens" denotes population density (country and time); "emhhi" denotes the HHI from Euromonitor relating to average data for the period 2004 to 2009 (country and sector-specific); "emc5" denotes the CR_5 indicator from Euromonitor relating to average data from the period 2004 to 2009 (country and sector-specific); "sbsm2" denotes the profit margin adjusted for the implicit labour income of the self-employed; "pmrr" denotes the OECD PMR indicator for the whole retail sector (country and time – interpolated); "pmrrbe" denotes the OECD retail sector PMR indicator relating to barriers to entry (country and time); "pmrrpc" denotes the OECD retail sector PMR indicator relating to price controls (country and time); "pmrror" denotes the OECD retail sector PMR indicator relating to operating restrictions (country and time); and "epl" denotes the OECD employment protection indicator relative to the euro area average (country and time).

1) The model was also run with relative real GNI per capita with broadly similar results.

being considered across a broad range of products, it was not possible to include the other structural indicators considered in Sections 1.1 and 1.3 which are specific to the grocery market, such as sales per square metre or store density.

a) *Market concentration*: Section 1.3 presented the two measures of market concentration, the HHI and CRk indicators, which are used here.[103] As market concentration indicators are not available for all years, the average observed over the period from 2004 to 2009 was used instead. Although on average it may be expected that there is a relationship between the degree of market concentration and the degree of competition and hence with price levels, it could be the case that a very fragmented market might also be a relatively inefficient one, with the upward impact on prices of inefficiency outweighing the downward impact of competition.

b) *Profitability*: Similarly, and as discussed in Section 1.3, whilst high/low profit margins may be indicative of low/high competition, they may also reflect other factors (such as capital return or high efficiency) driving down input costs. It should be noted that, as profit margin indicators are not available for all years, the average observed over the period from 1999 to 2007 was used instead.

c) *Regulation*: Lastly, measures of product market regulation in the distributive trades sector were incorporated, drawn from the OECD (in addition to its whole economy employment protection legislation indicator). It should be noted that the product market regulation indicators are only available for 1998, 2003 and 2008 and have been interpolated, using basic linear interpolation methods, for the other years.[104]

Firstly, as regards the *market concentration* measures, a general finding was that the HHI indicator (emhhi) impacted negatively on relative price levels, suggesting that the inefficiency effect was predominant. In contrast, the CRk indicator (emcx) impacted positively on price levels, perhaps capturing the competitive effect – the most significant relationship was found with the CR5 indicators (see column b in Table 12). Also, note that the number of observations declines significantly as only retailed goods are now considered, but the benchmark model results remain broadly intact – which may indirectly point to the robustness of the benchmark model.

Next, the *profitability indicator* was used, whereby profit margins are adjusted for the implicit labour income of the self-employed. This had a positive and significant impact[105] (see column c in Table 12).

Lastly, the OECD *product market regulation* indicators for the distributive trades sector were implemented. When just the overall indicator was inserted into the model it had a negative and significant impact. This was contrary to prior expectations. However, on further investigation, it appeared that the different components of the overall indicator, namely barriers to entry (pmrrbe), operating restrictions (pmrror) and price controls (pmrrpc) all had quite different effects (see column d in Table 12). Barriers to entry had a positive impact, but the impact of price controls was negative, whilst that of operating restrictions was insignificant. At first glance, the finding that price controls have a negative impact might appear at odds with the evidence reported in Section 1.2 that grocery price controls have been found to have an upward impact on prices in France and Ireland. However, this evidence relates to the impact of measures prohibiting sales below cost, whereas the OECD indicator involves administered prices. Lastly, the employment protection legislation indicator (epl) had a negative effect. This would not have been expected a priori and

103 Note that the concentration indicators implemented use data at the parent company level based on a definition of the national market, as these are available across the widest range of retail markets and segments.

104 Note that the updated indicator of shop opening times presented in Chapter 1 is not utilised, as this is available for only one year: 2010.

105 Note that when the profit margin indicator not adjusted for the implicit labour income of the self-employed was used, the coefficient, although positive, was not statistically significant.

suggests that further research is required in order to understand the underlying mechanism here.

In summary, whilst the benchmark model with relative income levels, VAT rates, expenditure intensity and population density performs well, augmenting it with indicators related to the structural features of the distributive trades sector improves its performance (see columns e and f in Table 12). The results indicate that these features may indeed have an impact on price levels and explain some of the divergence across countries as well as the "border effect" observed in the price data.

2.2 COMPETITION, OUTLET TYPE AND THE FREQUENCY OF PRICE CHANGES

The aim of this section is to review evidence from the IPN and WDN on price-setting behaviour and the impact of competition in the distributive trades sectors, as well as the structural features of these sectors.

The main findings are that more competition is associated with more frequent price changes in the retail sector, and that price changes are more frequent in supermarkets and hypermarkets, but not larger in average magnitude (results which hold across countries and product types).

Economic theory predicts that competition increases the responsiveness of prices to changes in costs or market demand, i.e. price flexibility. The empirical evidence presented in this section supports this prediction. These findings also show that price flexibility, as measured by the frequency of price changes, is higher in hypermarkets and supermarkets than in traditional corner shops. This can be interpreted in several ways.

Prices can be said to be flexible when they fully adjust to changes in the desired (optimal) price, which in turn depends on cost and demand, and to be rigid when they do not adjust to such changes. Dhyne et al (2009) argue that it is useful to make the distinction between price stickiness and price rigidity. They define price stickiness as a neutral term referring simply to the frequency of price changes, i.e. products ranked according to this frequency can be said to have stickier or less sticky prices. They define price rigidity as prices not fully adjusting to changes in the desired price. The distinction between price stickiness and price rigidity is useful, as it warns the reader when interpreting statements on the frequency of price changes. Indeed, prices of products may change very infrequently simply because both costs and demand show very little variation. On the other hand, they may also change very infrequently when costs and demand vary substantially.

Unfortunately, price rigidity, as defined above, is difficult to measure, as it has no simple direct empirical counterpart. In particular, the "desired/optimal price" remains a theoretical economic construct that, although useful when thinking about the nature of price changes, is not directly measurable. This is why, in practice, empirical studies consider the frequency of price changes to be a relevant indicator of price rigidity.

During the first half of 2008 a survey on firms' price and wage-setting practices was carried out by 17 NCBs (12 of which are in the euro area, while five are in new EU Member States), on the basis of a harmonised questionnaire. This survey was coordinated by the ECB, within the WDN. Overall, more than 17,000 firms were interviewed. In order to assess the impact of competition on price flexibility, these data were used, focusing only on the answers of the *retail* firms. Answers for retail firms in the dataset are only available from the following countries: Austria, Belgium, the Czech Republic, Spain, Hungary, Ireland, Italy, Lithuania, Poland, Portugal, Slovenia and Estonia.

This section also draws upon the work of the IPN (see below), which also addressed the impact of competition on the frequency of price changes. Fabiani et al. (2007) proposed the measure of competition used in the analysis, while Álvarez

and Hernando (2007a, 2007b) use euro area and Spanish data, respectively, to analyse the impact of competition on price flexibility.

COMPETITION INCREASES THE FREQUENCY OF PRICE CHANGES

Table 13 shows the answers of 1,020 retail firms surveyed as part of the WDN to the following question: "*Under normal circumstances, how often is the price of the firm's main*[106] *product typically changed?*" There is wide heterogeneity in the reported frequency of price changes. Just under a third of the retail firms report that they have no defined pattern of price changing. Around a quarter of retail firms report that they change the price of their main product once a year. However, around a fifth of the firms change their prices monthly, weekly or daily.

One important question is whether retail firms faced with competition tend to change their prices more frequently. In the WDN survey, the firms were asked the following question: "*Suppose that the main competitor for your firm's main product decreases its prices; how likely is your firm to react by decreasing its own price? Please choose a single option. (Very likely, Likely, Not likely, Not at all, It doesn't apply*).

The answers to this question can be understood as assessing the likelihood of a price reduction by competitors leading to a similar reaction by the retail firm. Table 14 shows the breakdown of the answers to this question. More than half of the retail firms state that they would be likely or very likely to reduce the price. Table 15 shows the breakdown of answers by the frequency of price changes and suggests a positive correlation between price competition and frequency of price changes. For instance, the firms reporting that they would be very likely to react to price changes by their main competitor more often answer that they would change their prices daily or weekly.

Reported competition has a statistically significant effect on the reported frequency of price changes (see Table 16).[107] Greater reported competition leads to more frequent price adjustment. Note that the negative figures are a result of the definition of the frequency of price changes variable (low values mean more frequent price changes). Thus the negative coefficient means that greater reported competition is associated with a lower value of the frequency of price changes variable (i.e. more frequent price changes). Interestingly,

Table 13 Distribution of reported frequency of price changes for "main product"

	Percentage
Daily	4
Weekly	10
Monthly	9
Quarterly	7
Twice a year	11
Once a year	23
Less frequent than once a year	2
No defined pattern	31
Other	2

Note: Based on 1,020 retail firms from the WDN survey.

Table 14 Breakdown of the reported likelihood of the price of the "main product" decreasing as a reaction to a price decrease by the main competitor

	Percentage
Very likely	18
Likely	38
Not likely	21
Not at all	5
No answer/Doesn't apply/Don't know	18

Note: Based on 1,020 retail firms from the WDN survey.

106 Firms were informed of the definition of "main product". This is especially relevant for retail firms which often sell hundreds of products. The instruction was: "If your firm produces (or sells) more than a single good or service, the answers must refer to the "main product (or service)", defined as the one that generated the highest share of your firm's revenue in the "reference year". For instance, if your firm produces (or sells) several types of hats and shoes, by "product" we mean "hats" and "shoes" (irrespective of the specific type), whereas by "main product" we mean the one that generated the highest revenue in the "reference year".

107 A similar regression in Druant et al. (2009) shows similar results for the entire sample of firms, i.e. including firms outside the retail sector. In addition, the regression results are robust to alternative specifications with the frequency of the distribution of price changes being less detailed.

Table 15 Breakdown of the answers on price competition by the frequency of reported price changes

(as a percentage)

	Very likely	Likely	Not likely	Not at all	No answer	Total
Daily	7	3	2	6	0	4
Weekly	17	10	5	10	8	10
Monthly	11	13	6	2	1	9
Quarterly	5	10	7	2	3	7
Twice a year	9	11	11	16	6	11
Once a year	18	20	29	37	28	23
Less than once a year	3	2	4	4	8	3
No defined pattern	29	30	33	23	44	31
Other	1	1	3	0	2	2

Notes: Based on 947 retail firms from the WDN survey. Columns add up to 100%.

larger retail firms, measured by number of employees, also have a higher reported frequency of price changes.

HYPERMARKETS AND SUPERMARKETS CHANGE THEIR PRICES MORE FREQUENTLY

Besides specific surveys such as those run within the context of the IPN and WDN, a whole range of studies in the past decade have used large-scale datasets of millions of individual prices to analyse the flexibility of prices at the retail level. These datasets usually consist of the underlying data used to construct the national consumer price indices. The data are monthly price records of specific products at specific outlets. A summary of the available evidence using these data for the euro area from the Eurosystem IPN is presented in Dhyne et al. (2006) and Dhyne et al. (2009). One prominent measure that has been used in these studies is the (monthly) frequency of price changes. The frequency of price changes for a set of products is defined as the fraction of products in that set that change prices from one month to another. This is also the approach adopted here.

Table 16 The effect of competition on the reported frequency of price changes for the main product

	Coefficient
Constant	**-2.39**
Competition	**-0.49**
Size: 20-49 employees	-0.19
Size: 50-199 employees	**-0.31**
Size: 200+ employees	**-0.56**
Labour cost share	-0.05
White collar share	**0.34**
High skill share	0.18
Full time permanent workers share	0.06
Employee turnover[1)]	-0.22
Bonus share	0.14

Note: The number of observations is 434. Country dummies are included. Coefficients significant at the 5% level are in bold. Turnover is calculated as the sum of the percentage of employees that left and those that joined the firm during the reference period. Other control variables are used to control for factors that influence cost structure, an element that is deemed important in determining the frequency of price changes. See Druant et al. (2009) for details.

Dhyne et al. (2006) report that, on average over the period January 1996-January 2001, almost 16% of the prices of the products included in the euro area HICP changed from one month to another. One important finding is that the frequency of price changes is greatly influenced by the type of products considered. Unprocessed food shows a higher frequency of price changes than processed food, and this in turn shows a higher frequency than non-energy industrial goods. This ranking is true across all ten euro area countries considered in Dhyne et al. (2006).[108] This effect of product type on the frequency of price changes should always be kept in mind when comparing the frequency of price changes according to (retail) outlet types. Evidently, not all outlet types sell the same products. However, cross-country analysis of price stickiness according to outlet type is hampered by the absence of a uniform European methodological

108 There were two small exceptions, as non-energy industrial goods have a higher frequency than processed food in Luxembourg and Finland.

Table 17 Frequency of price changes by outlet type

	Hypermarket	Supermarket	Discount store	Superette	Traditional store
Unprocessed food					
Finland	53.7	51.9	-	50.4	-
Austria	-	44.8	52.4	-	30
Italy	37.5	40.4	12.6	20.7	22.9
France	25.2	25.4	41.3	36.6	-
Luxembourg	54.5	50.4	-	-	30.6
Portugal	77.2	64.4	68.9	48.8	55.6
Processed food					
Finland	17.9	18.6	-	17.3	-
Austria	-	20.8	16.6	-	16.4
Italy	20.1	13.3	9.8	11.4	7.1
France	27.2	18.0	10.4	13.3	6.8
Luxembourg	18.0	8.6	-	-	6.0
Portugal	42.7	24.4	53.2	15.4	9.6
Non-energy industrial goods					
Finland	15.5	9.1	-	9.7	-
Austria	-	11.2	18.9	-	13.5
Italy	13.5	10.8	5.4	9.7	5.8
France	15.5	11.2	6.8	8.5	8.2
Luxembourg	8.1	6.4	-	-	17.7
Portugal	26.0	18.2	10.9	15.7	11.2

Note: Missing observations are due to missing outlet definitions in countries' outlet classifications or to too small a number of observations for meaningful estimates.

framework for recording outlet-type information jointly with price information.[109] Nevertheless, after taking these caveats into account, the preliminary evidence in Table 17 suggests that hypermarkets and supermarkets change prices more frequently relative to other outlets.

The effect of outlet type on price flexibility is now investigated, using an analysis of variance which captures the relative contribution of country, product category and outlet type to the variation in the frequency of price changes. For France, Italy, Austria, Finland, Luxembourg and Portugal, country-level aggregate frequencies of price changes were constructed for three product categories: unprocessed food, processed food and non-energy industrial goods at the aggregate outlet-type level. For reasons of comparison, the same basket of 50 products was used as in Dhyne et al. (2006), from which energy and services were excluded, leaving less than 30 products overall. The outlet types considered are: hypermarkets, supermarkets, discount stores, superettes and traditional corner stores.[110]

The analysis of variance results in Table 18 show that outlet types have a significant influence on the frequency of price changes controlling for country and type of good effects. Hypermarkets have, on average, a frequency of price change that is 12 percentage points higher than traditional corner shops. For supermarkets and discount stores, these are, respectively, 6.3 and 6.8[111] percentage points higher than traditional shops. In line with earlier research, both unprocessed and processed food prices also have a higher frequency of price changes than industrial goods. One explanation for the significantly higher frequency and magnitude of price changes in Austria is probably the fact that the calculations

109 For example, national statistical agencies recording the outlet type jointly with the price information refer to definitions made for internal use. These definitions are therefore not necessarily fully comparable across countries.

110 Owing to different classifications, hypermarket and superette data could not be constructed for Austria. For Finland, there are no data for traditional shops and discount stores. For Luxembourg, there are no data for superettes and discount stores.

111 The coefficient of discount stores is significant at the 10% level.

Table 18 Country, product and outlet-type effects on the frequency of price changes

Frequency of…	Price changes	Price increases	Price decreases
Constant	1.3	0.5	0.7
Country dummies			
Finland	6.6	3.3	3.2
Austria	7.1	3.7	2.8
Italy	-3.0	-2.2	-2.5
Portugal	**17.0**	**9.4**	**8.7**
Luxembourg	2.6	2.0	0.7
Product type dummies			
Unprocessed food	**30.9**	**16.8**	**14.3**
Processed food	**5.6**	**3.8**	2.1
Outlet type dummies			
Hypermarket	**12.0**	**6.2**	**5.6**
Supermarket	**6.3**	**3.7**	2.6
Discount store	6.8	2.7	**4.0**
Superette	2.8	1.9	1.1

Source: Eurosystem staff calculations.
Note: The number of observations is 71. The base case is an industrial good sold in a traditional shop in France. The model estimated using OLS is the following $f_{ijk} = c + \sum \alpha c_i + \sum \beta p_j + \sum \gamma o_k + \varepsilon_{ijk}$ where f_{ijk} is the average frequency of price changes for country i, product type j and outlet type k, c_i are country dummies, p_j are sectoral dummies, O_k are outlet dummies and ε_{ijk} are normal residuals. Reported coefficients are percentages. Coefficients significant at the 5% level are in bold. The results are qualitatively similar if f_{ijk} is replaced by the log odds ratio $\log(f_{ijk}/(1-f_{ijk}))$.

for Austria – in contrast to those for other countries – are based on data from 2006-2009, a time when aggregate inflation was also higher than at the beginning of the decade. In addition, it is impossible to control for different methods of reporting sales prices across countries.

A number of studies support the above finding, namely that larger retail outlets change price more frequently than smaller outlets, even controlling for the type of good. Baudry et al. (2004) find that, for France, when controlling for the type of good, the type of outlet matters for the frequency of price changes. Prices are found to be more flexible in hypermarkets, but much stickier in hard discount stores and traditional corner shops. Dias et al. (2004) find that big outlets in Portugal adjust prices more frequently than small outlets. Similarly, Jonker et al. (2004) find that, for the Netherlands, on average, small outlets have the smallest probabilities of changing a price. However, the effect of the size of the outlet can differ quite substantially according to product type. For instance, they find that food and non-alcoholic drinks, clothing and footwear, and furnishings, household equipment and household repair services provided by one-man businesses have a higher frequency of price changes than those provided by large outlets. For Italy, Veronese et al. (2005) report that traditional outlets tend to change the price of non-energy industrial goods and food products significantly less than large stores.

A number of possible reasons have been offered in the literature to explain why larger outlets such as hypermarkets and supermarkets show a higher frequency of price changes. A more detailed summary of this literature can be found in Dhyne et al. (2009). Different pricing strategies by different types of outlet seem to be important. The marketing literature seems to indicate that there are two polar pricing policies for supermarkets (e.g. Shankar and Bolton (2004)). Some stores resort to the "Hi-Lo" price policy and base their attractiveness on frequent price promotions. Others adopt an "every day low price" (EDLP) policy, whereby the attractiveness of the outlet is based on low and less varying prices than those of "Hi-Lo" outlets. "Hi-Lo" strategies should lead to a higher frequency of price changes than "EDLP" strategies. It is indeed likely that "Hi-Lo" strategies are more often found in hypermarkets

Table 19 Country, product and outlet-type effects on the *magnitude* of price changes

	Size of price increase	Size of price decrease
Constant	**8.2**	**7.3**
Country dummies		
Finland	**3.3**	**6.5**
Austria	**8.0**	**13.0**
Italy	**-3.4**	-1.7
Portugal	-0.6	-1.6
Luxembourg	-0.4	1.7
Product type dummies		
Unprocessed food	**8.0**	**6.3**
Processed food	-1.2	**-2.0**
Outlet type dummies		
Hypermarket	1.2	2.2
Supermarket	0.2	1.1
Discount store	0.4	1.1
Superette	0.1	0.7

Source: Eurosystem staff calculations.
Notes: The number of observations is 71. The base case is an industrial good sold in a traditional shop in France. The model estimated using OLS is the following $f_{ijk}=c+\sum\alpha c_i+\sum\beta p_j+\sum\gamma o_k+\varepsilon_{ijk}$ where f_{ijk} is the average frequency of price changes for country i, product type j and outlet type k, c_i are country dummies, p_j are sectoral dummies, o_k are outlet dummies and ε_{ijk} are normal residuals. Reported coefficients are percentages. Coefficients significant at the 5% level are in bold.

and supermarkets, while "low-price" strategies are found in discount stores.[112]

Another possible explanation for the higher frequency of price changes in hypermarkets and supermarkets is that larger stores reap increasing returns to scale in resetting prices, causing a higher frequency of price changes. Lünnemann and Wintr (2011), using data on internet prices in France, Germany, Italy, the United Kingdom and the United States, show that shops for whom the cost of a price change is higher (such as traditional retailers with an online presence and mail order companies) change their prices less often and by larger amounts than pure online sellers, for whom a price change is a matter of a keystroke (leaving aside the decision costs, etc.). Accordingly, the development of electronic price tags in hypermarkets and supermarkets is another possible explanation for their higher frequency of price changes, compared with traditional shops.

Finally, Table 19 shows the relative contributions of country, product category and outlet type to the variation in the *magnitude* of price changes. These suggest that outlet type does not have an effect on the magnitude of price changes.

2.3 RETAIL SECTOR CONCENTRATION AND PRICE DYNAMICS: A REGIONAL LEVEL ANALYSIS

The aim of this section is to combine information on concentration across different dimensions of the grocery sector (as presented in Section 1.3) with disaggregated regional data on price dynamics.

The main finding is that higher market concentration is associated with higher price growth in food and drink products in the recent period. The interpretation of this correlation calls for further research, but it appears to be robust and to hold across individual countries.

INTRODUCTION

As the basic link between producers and consumers, the retail distribution system plays a key role in determining prices and their evolution. In fact, most of the industrial organisation literature looks at the well-established relationship between competition and prices (see, for instance, Clarke and Davis (1982); Bresnahan and Reiss (1991); Nevo (1998 and 2001); Hausman and Sidak (2007)), finding that a more competitive market structure implies lower prices and enhances consumer welfare (Dobson and Waterson (1997),

112 To the extent that these pricing strategies dominate cost reasons for price changes, it is hard to determine whether the price stickiness measured by the frequency of price changes also measures price rigidity. This issue is considered in Eichenbaum et al. (2008), who use scanner data from a US supermarket chain to make the distinction between observed prices and reference prices. The latter are prices which remain constant for several weeks and around which observed prices vary, depending on temporary sales or promotions. They argue that what is economically significant is the rigidity of reference prices, as those prices are the ones expected to vary in response to changes in costs and demand.

and Barros et al., (2006)).[113] At the macroeconomic theory level, many papers have investigated the association between the frequency of price adjustments and the degree of monopoly power, showing a positive relationship between the absence of price changes and monopoly power and, conversely, between frequent price changes and strong competition.

Ciapanna and Colonna (2011), and Viviano et al. (2011) recently assessed the effect of concentration on price levels in the Italian retail market, using price level records collected for the computation of the Italian CPI merged with retail trade data released by Nielsen for the years 2003-2008. They found that concentration and prices tend to move in the same direction when looking at the parental group and at the store level, whereas they tend to be negatively related at the buying group level. The approach used below is similar to that used in Ciapanna and Colonna (2011), but, for reasons of data availability, the analysis focuses on price dynamics rather than price levels. Very few contributions have analysed the relationship between the degree of product market concentration and price dynamics (see, for instance, Scitovsky (1978) and Benabou (1992)[114]). Some studies, however, have analysed the relationship between product market competition and inflation. In this literature, a more competitive economy is expected to adjust more quickly to unanticipated shocks, for instance by reducing inflation after a supply shock. Przybyla and Roma (2005) find that the extent of product market competition, as proxied by the level of mark-up, is an important driver of inflation for a panel of EU countries.[115]

This section represents an initial attempt to analyse the impact of local level competition on price dynamics across the euro area. A regional analysis of the relationship between the degree of retail market concentration and price changes is conducted for two categories of grocery goods in the COICOP aggregation (food and non-alcoholic beverages; and alcoholic beverages and tobacco) in Germany, Spain, Italy, Austria, Portugal and Finland.[116] Using the unique census-type dataset on retailers (Nielsen structural data) presented in Section 1.3, the HHI is constructed at the buying group, parent company and individual store level, considering both the regional and local market definitions (see Section 1.3 for a more detailed discussion), and the relationship between this measure and regional price growth is investigated.

It is important to note that the Nielsen structural data used for the concentration indices refer to the year 2010, while this investigation focuses on price changes between 2003 and 2010. Although it would clearly be preferable to have data about the retail trade market structure over the same time span, one can reasonably expect that the differences in these structures across regions and countries dominate their evolution over time, so the retail trade market structure in 2010 remains informative about price changes over the whole period. Moreover, the HHI in 2010 can be interpreted as the outcome of a consolidation process which started in the 1990s. The hypothesis is supported in the Eurostat Structural Business Statistics, as well as in the business literature. However, the very fact of having regional CPI data – instead of price levels – makes the link with the concentration measures less immediate and the interpretation of the results more difficult.

Despite these limitations, an overall positive relationship is found between retail market concentration and price changes for food and beverages, as well as for alcohol and tobacco.

113 In addition to impacting on relative price levels, competition may have a persistent and long-lasting impact on price dynamics. This may arise both from transition effects from one regime to another, but also from the impact of competition in terms of enhancing productivity growth. For a more detailed discussion of the impact of competition on inflation and the various mechanisms at play, see, for example, Sbordone (2010), Jonsson (2007), OFT (2007) and Przybila and Roma (2005).

114 Benabou (1992), in particular, studies the inverse relationship and shows that inflation has a negative impact on mark-ups in the US retail sector.

115 Neiss (2001) and Cavelaars (2003) also find that product market imperfections play a role in explaining cross-country inflation rates and have a permanent impact on average inflation rates.

116 CPI regional data were not available for the other euro area countries.

The dataset is described below, after which the econometric strategy is presented and the results are discussed. A conclusion is then drawn and possible extensions are proposed.

DATA DESCRIPTION

The regional analysis is based on a unique dataset, constructed by using the structural Nielsen data along with the regional CPI data provided by the national statistical institutes for Austria, Finland, Italy, Germany, Portugal and Spain, and the Eurostat regional data (at the NUTS2 level). A complete description of the underlying structural dataset used in this analysis, including a discussion of the construction of locally based concentration measures, is provided in Section 1.3.3 and in the Appendix to Chapter 1.3.

The second data source includes sectoral CPI at the regional level from six euro area countries (Austria, Finland, Italy, Germany, Portugal and Spain) and 69 regions (NUTS2),[117] thereby covering about 65% of the euro area in terms of GDP. Only product categories that are plausibly sold across all stores are included in the reference data sample, namely food and non-alcoholic beverages (food), and alcoholic beverages and tobacco (alco).[118]

Overall, the dataset used for estimation includes 96 series, spanning the period from 2003 to 2010 at an annual frequency. The price change in a given region *i* and sector *j* at year *t* denoted by πijt is computed as the year-on-year percentage change in the respective sectoral price index, cpi_{ijt},

$$\pi_{ijt} = (cpi_{ijt} - cpi_{ijt-1}) / cpi_{ijt-1} \quad (1)$$

In the empirical model, some control variables from the Eurostat regional dataset are included. These are the regional density (population/km^2) and measures of the evolution of labour costs.[119] All these variables were available at the NUTS2 geographical level of detail.

EMPIRICAL MODEL AND RESULTS

The year-on-year percentage change in sectoral price index is modelled as follows:

$$\pi_{ijt} = \beta_0 + \beta_1 X_{it} + \beta_2 Duyear + \beta_3 Ducountry + \beta_4 DuCOICOP_i * HHIB_i + \beta_5 DuCOICOP_i * HHII + \beta_6 DuCOICOP_i * HHIS_i + \varepsilon_{ijt} \quad (2)$$

where the indices *i, j* and *t* respectively indicate the region, the COICOP category and the year.

The main variable of interest is the HHI – which is only available for 2010 – computed at three different levels of the sector:

1) for buying groups (HHIB);
2) for parental groups (HHIP);
3) for stores (HHIS).

Moreover, two versions of these indices have been considered: the first measures the concentration at the regional level, while the second provides a more localised measure

117 For Italy, NUTS3 was also available, but, in this case, NUTS2 aggregation was used to match the geographical detail of the controls.

118 The analysis has also been conducted for COICOP categories 3, 5 and 12 (clothing and footwear; furnishing, household equipment and maintenance; and miscellaneous goods and services, respectively), but these products are not representative in the Nielsen store dataset, as they are often only sold in hypermarkets and some large supermarkets, if at all, and are also sold in non-grocery outlets. Given the partial coverage of the dataset, these categories have not been included in the final sample. However, when the model was estimated with these further COICOPs being included, a negative association was found between the concentration indices and price growth for categories 3 and 5 (but a positive one for category 12). One possible explanation for the unexpected negative association might be a composition effect: clothes and footwear sold in non-specialised retailers are generally lower-quality products than their counterparts sold in specialised stores. A higher concentration at the store level may have stimulated greater consumption of these low-price and low-quality products, with the result that a parallel negative inflation trend is observed, which is due to the composition effect in consumers' expenditure. A full assessment of this issue would require further investigation, which is beyond the scope of this report.

119 For the latter, labour compensation, regional GDP (both in nominal terms and in PPS) and real value added growth were selected. These three variables were all highly correlated with each other. Labour cost was retained on account of it being a more precise proxy of expenditure capacity. The results are largely unchanged when considering the other two measures.

of concentration, as it is the average of sub-indices computed for narrow zones, defined as the set of stores operating within a 5 km (or 10 km) radius (see Section 1.3.3). In order to take into account possible differences across product categories, the concentration indices have been interacted with product dummies (for the two COICOP categories of interest). The model also includes country fixed effects (Ducountry) and year dummies (Duyear). The former should capture country-specific factors, including, inter alia, indirect taxes. The latter are aimed at capturing the common component in inflation in a given year (commodity prices, exchange rate, global economic cycle, monetary stance, etc.). X_{it} is a vector of other explanatory variables, having a regional and a time-varying component, specifically the regional population density and a measure of the evolution of local labour cost. The errors are clustered by region.

The model above, comprising the three measures of concentration (HHIB, HHIP and HHIS), allows the respective impact of these different measures of the sector's concentration to be assessed. Unfortunately, as far as *the regional analysis* is concerned, HHIC and HHIB appear to be strongly correlated, with a correlation coefficient around 0.8, reflecting an almost one-to-one mapping of the parental groups to the buying groups for many countries (see also Section 1.3.3). Most countries in the sample show a very high correlation between the two measures, so a collinearity problem arises in considering HHIB and HHIP together, which does not allow a proper assessment of their respective impacts. The correlation between HHIB and HHIS on the one hand, and HHIP and HHIS on the other, is instead very weak (0.3 and 0.2, respectively). Therefore, the model estimated in the empirical analysis is:

$$\pi_{ijt} = \beta_0 + \beta_1 X_{it} + \beta_2 \text{Duyear} + \beta_3 \text{Ducountry} + \beta_4 \text{DuCOICOP}_i * \text{HHIB} + \beta_5 \text{DuCOICOP}_i * \text{HHIS}_i + \varepsilon_{ijt} \quad (3)$$

The main results of the regression based on the indices computed at the regional level are summarised in Table 20. When considering the HHI at the buying group level, the coefficient is positive and statistically significant at the 10% level for food and beverages, and at 1% for alcohol and tobacco (column 1 in Table 20). The interpretation of these findings is that a higher degree of market concentration at the buying group level (i.e. many retailers joining together in large purchasing consortia), although increasing each retailer's bargaining power towards producers, does not always seem to have been associated with negative price dynamics. Thus, no welfare-enhancing effect for consumers is observed in these product categories. There are various plausible economic explanations for this result. On the one hand, it could reflect collusive behaviour between a dominant producer and its counterpart buying group; alternatively, it could be driven by a relatively low demand elasticity for local products in those regions where higher buying group concentration is observed. In this case, independently of the producer's bargaining power (and even in a perfectly competitive upstream market), there is no incentive for the retailer to share its surplus with the consumer, and the intermediary would practise surplus extraction from both sides.

The relationship between the concentration index computed at the store level and price growth is confirmed to be positive and statistically significant for alcohol and tobacco at 5% statistical confidence (column 3 in Table 20).

Table 20 Effect of *regional level* concentration on year-on-year sectoral price dynamics

	Buying Group		Shop	
	Coef.	Std. Err.	Coef.	Std. Err.
HHI[1] food	0.007[1]	0.004	0.009	0.014
HHI[1] alco	0.054[3]	0.018	0.114[2]	0.045
Controls:				
Country dummies	Yes		Yes	
Year dummies (2003-2010)	Yes		Yes	
Local labour cost	Yes		Yes	
Density	Yes		Yes	
Obs.	7,072		7,072	

Sources: Calculation based on Nielsen data, the regional CPI (obtained from national statistical institutes) and Eurostat.
Notes: Dependent variable is the annual change in the sectoral price index. Standard errors clustered at the regional level.
1) p<10%.
2) p<5%.
3) p<1%.

However, it loses significance for the first COICOP category, probably reflecting the dominating effect of the buying group concentration measure. Similar results are obtained when model (3) is considered, substituting the HHI at the buying group level with that at the parent company, while keeping the store concentration measure.[120]

The analysis is repeated using the HHI constructed at the *local* level (5 km and 10 km radius). In this case, the correlation among all three measures rises to 0.9. Therefore, the three indices are observationally equivalent and model (1) reduces to:

$$\pi_{ijt} = \beta_0 + \beta_1 X_{it} + \beta_2 Duyear + \beta_3 Ducountr + \beta_4 DuCOICOP_i * HHIS_i + \varepsilon_{ijt} \quad (4)$$

The main results of the regression based on the indices computed at the local level are summarised in Table 21. The coefficient for HHI is positive and statistically significant at the 10% level for food and beverages, and at 1% for alcohol and tobacco (Table 21). Given the high correlation among the three levels, it would be inappropriate to consider the index at the buying group, parent company or shop level. For the same reason, the intensity of the HHIS coefficients provided in Table 21 can only be compared with column 1 in Table 20. Several robustness checks of the model are conducted, in which different measures of wealth are included in the vector of controls (regional GDP, growth rate of real value added, etc.). The analysis is also repeated on a country-by-country basis, investigating the specific dynamics of the two "extreme" countries in the sample: Finland (the most concentrated) and Portugal (the least concentrated). When controlling for individual market structure characteristics and excluding the outliers, the main results of the pooled analysis are left unchanged.

Table 21 Effect of *local level* (*5 km radius*) concentration on year-on-year sectoral price dynamics

	Shop	
	Coef.	Std. Err.
HHI [1] food	0.006 [1]	0.004
HHI [1] alco	0.099 [3]	0.015
Controls:		
Country dummies	Yes	
Year dummies (2003-2010)	Yes	
Local labour cost	Yes	
Density	Yes	
Obs.	7,072	

Sources: Calculation based on Nielsen data, regional CPI (obtained from national statistical institutes) and Eurostat.
Notes: Dependent variable is the annual change in the sectoral price index. Standard errors clustered at the regional level.
1) p<10%.
2) p<5%.
3) p<1%.

CONCLUDING REMARKS AND POSSIBLE EXTENSIONS

The relationship between market structure, and price levels and dynamics has fostered two economic strands of literature. On the one hand, the industrial organisation contributions find that a more competitive market structure implies lower prices and enhances consumer welfare. On the other hand, the macroeconomic theory strand analyses the relationship between the frequency of price adjustments and the degree of monopoly power, finding a positive relationship between the absence of price changes and monopoly power and, conversely, between a high frequency of price changes and the degree of competition.

The relationship between market structure (in terms of equilibrium concentration outcomes) and price dynamics in six euro area countries was investigated. The analysis has looked at both the upstream and downstream aspects of grocery products (COICOP 1 and 2). By using a unique database containing both regional year-on-year percentage price changes and concentration measures, it can be seen that these price changes are positively affected by the degree of concentration. A possible extension of the analysis could be to test for the impact of competition on inflation volatility. Another possible extension of the model could be the use of detailed price levels in conjunction with structural Nielsen data which varies over time (as in Ciapanna and Colonna (2011), and Viviano et al. (2011)).

120 This is expected, given the correlation between the HHIB and HHIG previously pointed out.

Box 6

THE IMPACT OF INCREASED COMPETITION IN THE DISTRIBUTIVE SECTOR ON EMPLOYMENT AND OUTPUT – A DSGE MODEL ANALYSIS

This box assesses the domestic and cross-country macroeconomic implications of competition-enhancing reforms implemented in the distributive services in a euro area country from a multi-country perspective on the basis of a simulation with the Euro Area and Global Economy (EAGLE) model.[1] This model is a large-scale New Keynesian dynamic general equilibrium model of the euro area and the world economy. The euro area is modelled as a two-country monetary union having a common monetary policy and nominal exchange rate against the rest of the world (which is split into two regions).

For the purpose of this box, the model has been calibrated such that the developments of the main macroeconomic aggregates approximate the structural features of a single euro area country representing 10% of the euro area GDP. The shares of imports and exports of investment and consumption goods from the other regions have been calibrated along the prevalent share parameters.

The model features monopolistic competition in product and labour markets. There is a mark-up between the marginal cost and prices. Consistent with the monopolistic competition framework, the mark-ups are inversely related to the degree of substitutability across product and labour varieties, and hence the underlying level of competition.

The model distinguishes between sectors for tradable and non-tradable intermediate products. Hence, its design is suitable for analysing the effect of increasing the degree of competition in the services sectors, which are generally considered to mainly produce non-tradables. In line with the findings in the literature, the degree of competition is calibrated to be lower, i.e. mark-ups on prices are higher, in the non-tradable sector: the price mark-up in the euro area is set to 40% in the services and 20% in the manufacturing sectors. In the United States and in the rest of the world, the corresponding mark-ups are 28% and 20%.[2]

Given that the model does not have an explicit distributive sector as part of the non-trading sector, the distributive sector in this model is regarded as part of the sector producing non-tradable, intermediate products. A policy reform leading to more competition in the distributive sector is introduced into the model by assuming that price mark-ups in the distributive sector fall permanently by 15%.[3] The policy change is assumed to be implemented in a gradual fashion, so the decline in the price mark-up is assumed to gradually phase in over a period of five

1 See Gomes et al. (2010). A simulation exercise similar to the one presented here is also discussed in Gomes et al. (2011).
2 These values appear to be in line with similar existing studies, such as those of Bayoumi et al. (2004), Farouqee et al. (2007), and Everaert and Schule (2008). Many, if not all, of these studies refer to Jean and Nicoletti (2002), Oliveira Martins et al. (1996) and Oliveira Martins and Scarpetta (1999) for estimates of mark-ups on the basis of OECD data. Some additional empirical evidence for the euro area is provided by Christopoulou and Vermeulen (2008).
3 Measures contributing to increased competition could entail less regulation regarding the registration, licences and permits required to open new shops, large outlet restrictions, zoning regulations and shop opening hours. Such measures often have the aim of strengthening competition from new entrants to the market and thereby decreasing the rents of incumbent market participants.

Long-run effects of a permanent decline in price mark-ups in the services sector

(percentage deviation from baseline)

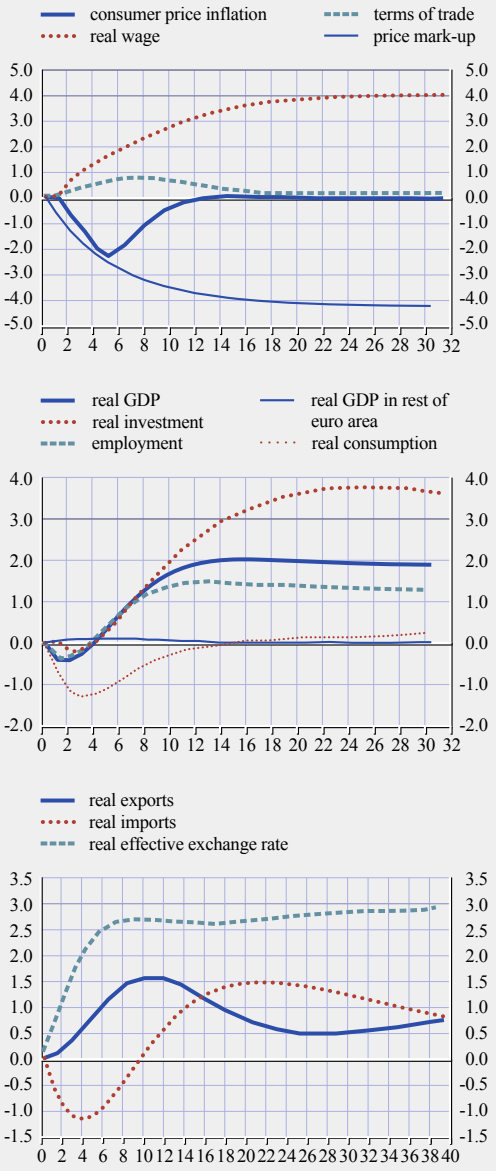
	Long-run effects
Real GDP	1.818
Real consumption	0.836
Real investment	3.817
Real wage	4.149
Employment	1.052
Terms of trade	0.232
Real effective exchange rate	2.829
Real exports	0.677
Real imports	0.393
Real GDP in rest of euro area	0.002

years.[4] This is implemented as a permanent decline of the price mark-up in the non-trading sector of 4.3%,[5] corresponding to the proportion of the distributive sector relative to the non-trading sector (about one-third in terms of value added).[6] This assumption can be justified by the overall close-to-linear behaviour of the model: variations of shocks give rise to close-to-proportional variations in the impulse response functions and in steady states. Furthermore, the most crucial assumption affecting the qualitative properties of the transitional dynamics on macroeconomic aggregates such as total employment, output and inflation is that the shock affects only the mark-ups on the marginal cost of services which are not internationally traded, whereas the size of the shock only gives rise to a proportional shift of the impulse response functions.

As the policy measure is assumed to cut down the price mark-up in the non-tradable sector permanently, it not only features transitional dynamics, but also changes the steady state of the model. Reforms are fully credible and, given the assumption of perfect foresight, their long-run effects and the transition path are

Short-run effects of a permanent decline in price mark-ups in the services sector

(percentage deviation from baseline)



Notes: The horizontal axis shows quarters starting at the period when the policy measure is first implemented. The vertical axis shows percentage deviations from the baseline, except for inflation (annualised percentage point deviations). GDP and its components are reported in real terms.

4 More precisely, it is assumed that 95% of the final decline of the mark-up in the new steady state has been reached after five years.

5 This implies a reduction in the mark-up factor in the non-tradables sector from 1.40 in the baseline scenario to 1.34 in the reform scenario.

6 Such changes in mark-ups are not unrealistic. For instance, Badinger's (2007) analysis of competition in the manufacturing, construction and services sectors in ten EU Member States concludes that mark-ups in the industry sector declined by 28% from the early-1990s until 1999. In contrast, he finds mark-ups to have gone up in most service industries in the same period, which he interprets as indicating the weak state of the completion of the Single Market for services.

assumed to be anticipated by economic agents. Both the long-run (steady-state) effects and the transitional dynamics are discussed here.

The Table reports the long-run results of reducing the (gross) mark-up non-tradables in the calibrated model by 5 percentage points, corresponding to a reduction in the mark-up for distribution services of 15 percentage points. Overall, the macroeconomic impact of such an economic reform is sizeable: compared with the no-reform scenario, domestic output increases by 1.8%. The increase is driven by both higher investment (+3.8%) and higher consumption (+0.8%). Firms increase demand for capital and labour. Consequently, employment (hours worked) and real wages increase by 1.1% and 4.1%, respectively. Regarding the effect on international trade, the increase in the supply of services implies a depreciation of the real exchange rate and a deterioration of the terms of trade, as the relative price of services (non-tradables) becomes lower. Consequently, exports increase by 0.7%. The higher aggregate demand drives an increase in imports (+0.4%).

The Chart shows the domestic effects of reforms in the services sector along the transition from the initial to the new steady state as deviations from the steady state in the no-reform baseline scenario. As a direct impact of the reform measure, the price mark-up will decline and consumer price inflation will fall below the baseline in the short run. This effect fades out and, once the reform has been implemented fully and all adjustments have been made, consumer price inflation rebounds to the long-run monetary policy target. Perhaps counter to what might be expected, according to the model simulation, consumption will fall in the short run and will increase only in the medium term. This is because domestic households anticipate that services will be cheaper in the future, when their supply will be higher. Given the high services content of consumption, households postpone consumption to future periods, when consumption goods will be cheaper. Therefore, private consumption drops in the first year and starts increasing afterwards, still remaining under the no-reform scenario level for about four years, about the amount of time needed to fully implement reforms.[7] Simultaneously, firms anticipate the higher future production level and increase their demand for capital and labour. This drives up the demand for domestic tradable goods and induces the real wage to increase. After a short delay, output increases towards its new long-run level. Domestic exports increase, while imports decrease in the short run, as the immediate lowering effect of lower mark-ups on domestic prices gives rise to an improvement in domestic price competitiveness as indicated by the depreciation of the real effective exchange rate. In the medium term, both exports and imports will stay above the baseline path, reflecting higher domestic and foreign demand. The spillover impact on the rest of the euro area, while positive in the long run, is negligibly small overall.

7 While consumption achieves levels above the baseline steady state after four years, the full adjustment to the new long-run equilibrium level happens very gradually. Consumption will achieve 50% of the new equilibrium level after 17 years.

2.4 THE RETAIL TRADES AND PASS-THROUGH

The aim of this section is to provide empirical evidence on the pass-through of costs into domestic prices (consumer and producer), examine how this varies across countries and sectors, and whether it is related to structural factors. In order to do so, this section analyses the pass-though of import and producer prices to consumer non-energy industrial goods prices in euro area countries. Additionally, evidence for the pass-through to food prices and the clothing and footwear sector is provided.

The main findings are as follows. A large variation is found in the transmission of costs to final goods sold across euro area countries and sectors. A joint analysis of the pass-through of import and producer prices suggests that producer prices are more relevant for the determination of

consumer prices in larger euro area countries. This analysis finds no significant evidence for the link between pass-through estimates across countries and sectors, and structural indicators. However, the degree of competition appears to be positively related to the pass-through if the estimation is restricted to the long-run elasticity of consumer prices to import prices. Regarding food prices, some relevant differences in the pass-through estimates have been found across countries and products, which can be partially related to structural features of the retail trade sector, such as cross-country differences in the type and composition of retailers and producers. In particular, a stronger presence of discounters seems more likely to be associated with a higher pass-through. Finally, the available evidence on price pass-through in the clothing sector points to a reduced transmission of the fall in import prices to consumer prices.

2.4.1 PASS-THROUGH INTO CONSUMER NON-ENERGY INDUSTRIAL GOODS PRICES

MOTIVATION

A robust feature found in the literature on the pass-through of costs into domestic prices is their declining size along the domestic production chain. This is explained partly by the presence of local costs, driving a wedge between border and retail prices.[121] An alternative explanation is that imperfect competition gives rise to profit margins which can also provide partial insulation from internationally transmitted shocks. However, the impact of the market structure in the retail sector seems to be an under-investigated area.

Pass-through variations across countries and sectors are difficult to evaluate, as types of shocks and macroeconomic environments, for instance, are not the same across studies. Warmedinger (2004) investigates the cost transmission for five euro area countries, finding a comparatively lower cost transmission of external shocks into import prices for Germany than for France, Italy and Spain. The lower cost transmission into German import prices is the effect of the adjustment of firms to competitors' prices, which is stronger in Germany than in the other countries. Less than 60% of foreign costs are passed on to German import prices, while for France and Spain the pass-through is above 80%. Although the size of the transmission into domestic prices varies across studies, it seems that some countries (such as Germany) often appear at the lower end of the pass-through spectrum, whereas other countries (such as France) often appear at the higher end of the spectrum. The latter is confirmed by Campa and Minguez (2004). They investigate an exchange rate shock to domestic import prices and find that the long-run elasticity of exchange rates is rather high for Spain and Italy, but comparatively low for Germany and smaller countries like Ireland and Austria. For the former countries, the elasticities are (almost) complete, while a much lower pass-through into import prices was found for the latter countries, at about half of the complete pass-through.[122]

A number of studies in different settings report a lower impact of cost shocks on consumer prices than on producer prices.[123] Hahn (2003) looks at the declining size of the pass-through along the production chain, as well as the impact of different shocks for the euro area aggregate. The results indicate that the effect of an external shock on producer prices in manufacturing is

121 It should be noted that complete pass-through of a cost change to retail prices does not entail a one-to-one relationship between the percentage change in costs and the percentage change in prices. Other things being equal, the higher the portion of the final selling price that is accounted for by the cost, the higher the pass-through coefficient will be. This is unlike the exchange rate pass-through literature, where a one-to-one relationship tends to be observed between the exchange rate movement and the domestic price change. This is because the exchange rate change applies to the entire import cost, whereas the retail selling price is comprised of a number of costs of varying importance. Therefore, the pass-through coefficient (the elasticity of the selling price with respect to a specific cost factor) may be less than unity even when pass-through is complete.

122 However, these estimates are not fully comparable, as not all types of shocks are the same and the pass-through may also vary across different macroeconomic environments. For instance, some authors argue that the impact of cost transmissions increases during high inflation periods.

123 Among them are Campa and Minguez (2004), Goldberg and Campa (2006), and Hahn (2003), as well as Landau and Skudelny (2009). Clark (1999) reports similar findings in the aftermath of a monetary policy shock.

most pronounced in the case of an increase in non-oil import prices (61% of the shock is transmitted after one year), followed by a shock to the euro exchange rate (28% cost transmission after one year).

Differences in the product-specific size of the cost transmission have been analysed empirically less frequently. Goldberg and Campa (2006) look at the role of the distributive margins in the aftermath of an exchange rate shock and their importance for the cost transmission into consumer prices across 21 OECD countries. They find common sectors across countries for which margins are typically high or typically low: margins are comparatively high in furniture, textiles and leather products, but lower in petroleum, natural gas and some mining products. Most importantly, however, the margins decrease in the case of depreciations and hence in the wake of more expensive imports. Unfortunately, the drivers of this variation of margins are not analysed.

Empirical evidence of the impact of the structure of the retail trade sector is scarce, although some studies point towards competition as a key driver of the pass-through. For instance, an empirical investigation on firms' behaviour was conducted by Bertola et al. (2010), who found that the pass-through of an input cost shock to prices is lower in an environment of highly competitive product markets, as firms have more incentives to reduce wage costs instead of product prices (lower pass-through into retail prices). However, in the presence of collective wage agreements and more stringent employment protection legislation, it is more likely for the firm to respond to shocks by increasing prices instead of lowering costs, resulting in higher pass-through retail prices.

Another attempt to explain the ultimate drivers of the cost transmission is made by Francois et al. (2008), who study the pass-through of an import price shock to producer and consumer prices across EU Member States. At the product level, the pass-through effect on producer prices is highest for household maintenance items, textiles and clothing, medical products and purchases of vehicles. At the consumer level, the pass-through is highest in the food sector, as well as in the textiles and clothing sector. Most importantly, the authors give empirical evidence on the link between indicators of retail competition (such as barriers to entry and price controls) and the size of the pass-through to consumer prices. In particular, they show that the pass-through estimates are higher in less regulated markets than in more regulated sectors.

EMPIRICAL ANALYSIS

This section investigates the pass-through of changes in costs of final goods for sale (using import and producer (PPI) prices), specifically items of HICP non-energy industrial goods.[124] The pass-through of the import prices of final goods and of PPI for domestic sales to non-energy industrial goods prices is examined in an autoregressive distributed lag (ARDL) model. As this approach faces some limitations, the pass-through of total import prices is looked at, following Francoise et al. (2007, 2008).

In the following analysis, import prices are measured by unit value indices (UVI) for intra and extra-euro area imports.[125] UVI and PPI data have been mapped for 15 product sectors with HICP data, covering about 23% of the HICP and about 80% of non-energy industrial goods for the euro area. The mapping table is shown as Table A15 in the Technical Appendix.[126]

Pass-through of import and producer prices to consumer prices

The pass-through of domestic and foreign costs is analysed first, using ARDL specifications. This means that domestic consumer prices are

124 While it would also be interesting to have information on the impact of the structural features on the pass-through of other costs, in particular wages (on a sectoral level), which are of high relevance for the retail sectors, the data needed for this analysis are not available.

125 Imports are based on the CPA 2002 trade data, while industrial producer prices (PPI) are based on the NACE Rev. 2 classification.

126 Importantly, this mapping of different classification schemes has its caveats, as, in many cases, the UVI, PPI and HICP cover not identical goods, but just a similar class of goods. Moreover, while the PPI and HICP are "real" price indices with a well-defined basket of goods and high statistical standards, UVI are usually of lower data quality.

explained by their own lagged values and the current and lagged values of all other main explanatory variables:

$$\Delta hicp_t = \alpha + \sum_{i=Lh} \beta_i \Delta hicp_{t-i} + \sum_{i=Lp} \gamma_i \Delta ppi_{t-i} + \sum_{i=Lu} \delta_i \Delta uvi_{t-i} + dummy(VAT) + e_t$$

Variables in lower case letters are in logs, while first differences account for unit roots in the time series.[127] The series are quarterly, the longest covering the period from the first quarter of 1990 and the third quarter of 2010, but in many cases the estimation period is shorter, depending on the availability of data.[128] Owing to data limitations, only ten euro area countries are covered in this analysis: Belgium, Germany, France, Ireland, Italy, Spain, the Netherlands, Austria, Portugal and Finland. Estimation results are shown in Table A16 in the Technical Appendix, where only positive pass-through coefficients significant at the 5% level are reported.

Looking at the PPI pass-through in terms of the median estimate of a product category across countries, it appears that a pass-through of more than 0.5 (in descending order) is found for "Jewellery", "Personal transport equipment", "Information processing equipment", "Equipment for reception (TV/radio)", "Cars", "Textiles" and "Furniture". An almost complete or full pass-through was found for "Jewellery" in quite a number of countries. A pass-through for the PPI below 0.5 was found for "Pharmaceutical products", "Personal care appliances", "Newspapers/Books", "Non-durable household goods", "Sports equipment" and "Household appliances". Meanwhile, UVI pass-through estimates are considerably lower, with only one sector (photographic equipment) having a pass-through estimate exceeding 0.5.

Overall, price changes for domestic goods (i.e. PPIs) tend to be of higher importance for prices of manufactured consumer goods in the larger euro area countries, reflecting significant domestic production, while import price changes (i.e. UVI) are more relevant for consumer prices in smaller, more "open" euro area countries where imports play a greater role. The latter seem to be linked to an import content that is likely to be higher in retail sales and to very little own production, which is also partly a reason for the reduced availability of PPI data for these countries.

However, no significant association is found between these pass-through estimates across products/countries and structural features of the retail sector – measured by the HHI and the profit share. This finding does not necessarily mean that the pass-through of costs is independent of structural features in the retail sector in the euro area economies, but rather illustrates that the analysis faces many difficulties, partly related to the availability and quality of price and cost data, as well as that of structural indicators, at a detailed sector level.

Impact of import prices on consumer prices

Given that there were some limitations to the previous ARDL approach, a simpler analysis is now applied to the impact of import prices on consumer prices. Mainly following the approach of Francoise et al. (2007, 2008), domestic producer prices are approximated by intra-area import prices.[129] More precisely, long-run pass-through elasticities of non-energy industrial goods prices to changes in total import prices are estimated using the following equation:

$$\ln HICP_t = \alpha + \beta \ln UVI_t \; (+\delta T)$$

127 Dummy variables for changes in the country's standard VAT rate are included if significant. The lag structures are determined by reducing a general specification to a parsimonious one by F-tests and t-tests on the significance of sets and single parameter estimates. The long-run elasticity of the pass-through of producer prices to domestic consumer prices is given by

$$\sum_{i=Lp} \gamma_i / (1 - \sum_{i=Lh} \beta i).$$

128 Consumer prices of clothing and footwear are seasonally adjusted, taking account of a strong and changing seasonal pattern. The other variables are not adjusted, as the autoregressive part of the equation is able to capture the seasonality adequately.

129 While this is a rather bold assumption, it allows use of a consistent data classification set to be made, a high level of coverage across euro area countries and sectors, and the extraction of just one pass-through estimator.

where the log of HICP prices is regressed on a constant and the log of the respective UVI (intra and extra-area import prices). As prices of a number of electronic products have been on a downward trend due to technical progress and related quality adjustment in the HICP, which is not sufficiently reflected in UVI, a time trend is added to the equation.[130] Only the estimated parameters which are positive and significant at the 5% level are reported.[131]

The median elasticity of import price changes to consumer prices is estimated at 0.45 across the 12 euro area countries and 15 sectors considered in this analysis (see Table A17 in the Technical Appendix). However, the pass-through across industries and countries is rather dispersed. For comparison reasons, the estimated elasticities for the euro area as a whole are added, with an estimated median pass-through of 0.54. This is largely comparable with results in the literature, such as those of Hahn (2003), who estimates the pass-through of non-oil import prices to the overall euro area HICP at 0.31 after three years. It is possible that this latter estimate is kept down by the very low pass-through of import prices to consumer energy prices, which are included in the overall HICP.

In ten sectors, the median long-run import price elasticity of consumer prices is around 0.5, and, in most of these sectors, import price elasticities are significant for almost all countries. This is particularly true of the sectors "Furniture", "Appliances for personal care", "Jewellery, clocks and watches", "Newspapers, books and stationery" and "Motor cars". Fewer significant results at the country level are found in the clothing and footwear sector, where the median elasticity is 0.4, but with large country dispersion. The same applies to the items "Information processing equipment" and, albeit to a lesser extent, "Photographic equipment, etc." and "Household appliances". The inclusion of a time trend in the estimates for these two sectors, which attempts to capture the impact of technical progress, does not help in detecting a significant relationship between the HICP and UVI. This may also explain the few significant and meaningful results at the country level for the "Household appliances" sector, with a median pass-through of 0.1. There is also little discernible pass-through in the "Games, toys and hobbies" and "Equipment for sports, camping and open-air recreation" sectors.

Regarding country divergence, consumer prices seem to have relatively high import price elasticities (i.e. a median higher than 0.5) in Belgium, the Netherlands and Spain, and a relatively low one (median of 0.2) in Ireland. Overall, the findings are somewhat different to those of Francoise et al. (2008), but these are based on a different sample with respect to the countries, period and goods. Nevertheless, they confirm that the impact of import prices on consumer prices varies greatly across countries and sectors.

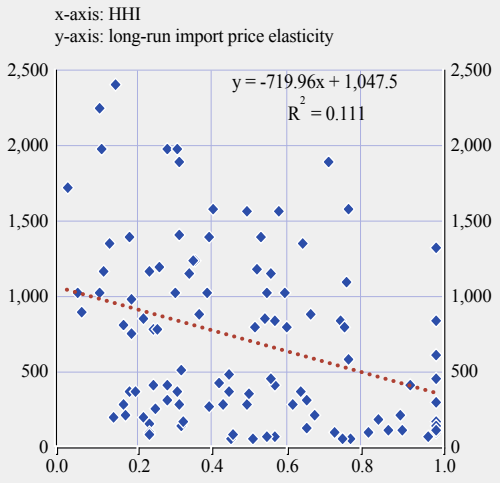
There is some evidence that the magnitude of the estimated pass-though is related to the degree of competition/concentration in the specific country and sector. Chart 17 shows a negative, albeit weak, relationship between the estimated import price elasticity and the HHI, suggesting that the stronger the competition (i.e. the lower the HHI), the higher the elasticity of consumer prices seems to be with respect to import price changes. By contrast, no link seems to exist between the estimated coefficients and the profit share (see Chart 18).

To check the robustness of the above relationship, an estimation is made of whether competition significantly impacts on the magnitude of the import price elasticity, once controlling for effects stemming from cross-sector differences. A panel regression

130 All series have been seasonally adjusted by ARIMA X12. SUR estimation is applied to allow for contemporaneous correlation between the error terms across the country equations for a specific sector, as the shocks are expected to be sector rather than country-specific.

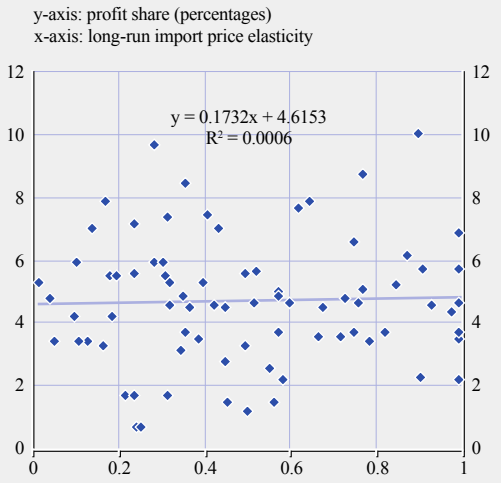
131 UVI and HICP series are, in most cases, non-stationary, which implies that conventionally used tests do not have standard asymptotic distributions. However, the HICP and UVI series are not expected to be co-integrated, as an important part in this relationship, namely the costs of domestically produced goods, is missing.

Chart 17 Estimated import price elasticity and the HHI



Sources: SBS, Euromonitor and Eurosystem staff estimates.
Note: Pass-through coefficients larger than 1 have been restricted to avoid them biasing the results.

Chart 18 Estimated import price elasticity and profit share



Sources: SBS, Euromonitor and Eurosystem staff estimates.
Note: Pass-through coefficients larger than 1 have been restricted to avoid them biasing the results.

with sector fixed effects is run, where the import price elasticity is explained by the HHI. As can be seen in Table 22, the measure of competition used here has some explanatory power for the import price elasticity, confirming that competition leads to a higher transmission of cost changes, although the overall impact is not very strong. This finding is in line with theory suggesting that transmission of cost changes is complete in perfectly competitive markets and similar to that obtained in Francoise et al. (2008). However, other structural indicators, such as the profit share and the OECD product market indicator, do not help to explain the observed differences in pass-through estimates.

Table 22 Regression results: import price elasticity and competition using fixed effects

	Coefficient	T-value
HHI	-0.00013	-2.37
Constant	0.52478	11.75

Note: Number of observations: 96 (using elasticities only when they are <1), R-sq: within 0.0654, between 0.2187, overall 0.0887, Prob>F = 0.0204.

Box 7

DEVELOPMENTS IN CLOTHING AND FOOTWEAR PRICES

This box considers clothing and footwear prices in the euro area, focusing in particular on developments since the phasing-out of the Multi-Fibre Arrangement (MFA) in January 2005, when remaining quotas on trade in textiles and clothing were scheduled to be eliminated.[1] In principle, the ending of the MFA should have opened up European markets to lower-cost

1 In the immediate aftermath of the phasing-out, reports of a surge in imports from China and other countries led to a temporary reintroduction of controls. According to the European Commission's website, however, "since [the] beginning of 2009 trade in textiles and clothing [has been] fully liberalised and there are no longer any quantitative restrictions in the EU", but in the footwear sector, "anti-dumping measures put in place since 2006 [were] extended in December 2009 in order to counter unfair competition from China and Vietnam".

imports. These lower costs would be passed on to consumer prices in the presence of competitive markets. This box reviews price level differences for clothing and footwear products across the euro area, relates them to developments in import prices and estimates the pass-through of producer and import prices into consumer prices. The possible relationship with structural features of the clothing and footwear retail sector is also analysed.

Notwithstanding considerable liberalisation in the markets for clothing and footwear products, both externally – via the abolition of the MFA – and internally – via the single market – price levels across the euro area remain heterogeneous, with differences of around 35% between the highest and lowest prices across countries, as was shown in Section 2.1. Chart A shows that clothing and footwear prices have generally been highest in Finland, Belgium and Luxembourg, while relative price levels in Greece, Spain and Portugal have risen over time. By contrast, Ireland has recorded a sharp fall in absolute and relative clothing and footwear price levels. These developments mean that dispersion across countries has fallen noticeably. The standard deviation fell from a range of around 25-30 to a trough of 6-8, before increasing somewhat between 2008 and 2010.[2]

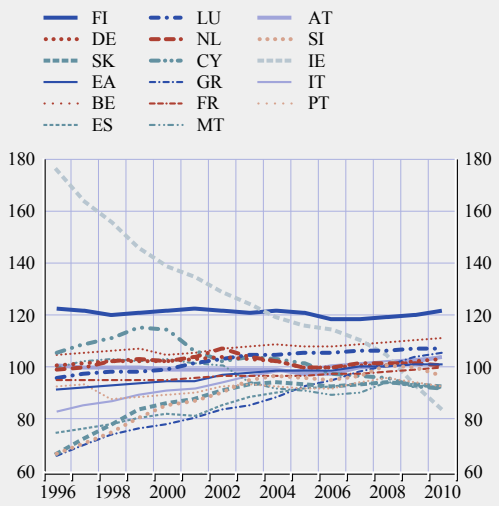
1) Import developments – volumes, prices and market shares

Starting with the impact on import quantities, there is no evidence of a surge in extra-euro area imports of textiles and clothing after 2005 (see Chart B). In fact, the share of textiles and clothing in total extra-euro area imports of goods continued to decline, to around 5%. The most

2 If data from Ireland and Greece are excluded, the decline in dispersion is lower but still noteworthy – from around 15 in 1996 to a trough of 7 in 2008.

Chart A Evolution of relative clothing and footwear price levels

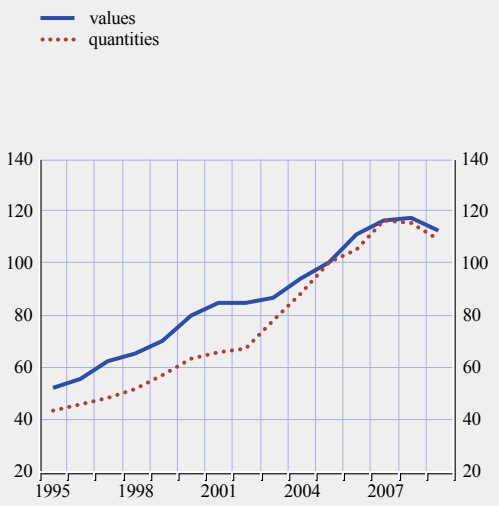
(euro area 2007-2009 = 100)



Sources: Eurostat and Eurosystem staff calculations.
Notes: These data have been constructed by combining Eurostat's PPP and HICP data. Price levels relative to the euro area average were constructed using the period 2007-2009 as a base. Then the time series profile from the HICP was used to cast backwards and forwards.

Chart B Extra-euro area imports of textiles and clothing

(indices; 2005 = 100)

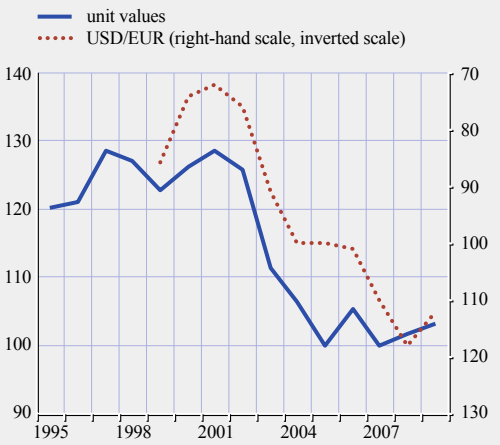


Sources: Eurostat and ECB staff.
Note: "Textiles and clothing" comprises sectors 1810 and 1920 of the ISIC system.

significant change was in the geographical breakdown of euro area imports of textiles and clothing. Countries that already enjoyed unrestricted or preferential access to the euro area before 2005 (e.g. non-euro area EU Member States and African, Caribbean and Pacific (ACP) countries) have lost overall market share to other countries. Most notably, China has doubled its share in euro area imports of textiles and clothing since 2005, despite the restrictions on imports from China between 2005 and 2008.[3] This geographical shift was to be expected, as China has a strong revealed comparative advantage in textiles and clothing, while its exports to the EU had been particularly constrained prior to 2005.[4]

Chart C Extra-euro area import unit values of clothing and footwear

(index, 2005=100)



Sources: Eurostat and ECB.

As regards clothing and footwear prices, the close co-movement with the USD/EUR exchange rate points to a considerable degree of exchange rate pass-through (most imports in this sector are denominated in US dollar). Since 2005 import prices of clothing and footwear have fluctuated without a clear trend. In terms of possible price effects of the phasing-out of the Agreement on Textiles and Clothing (ATC), extra-euro area import prices of textiles and clothing declined only marginally between 2007 and mid-2008, following the price decreases observed before 2005 (see Chart C).[5] More recent factors that have exerted upward pressure on the import prices of clothing and footwear include the global economic recovery and the rising world market prices of raw materials, such as cotton. However, the evolution of unit price indices should be interpreted with caution, since they are not based on a well-defined basket of goods and do not account for quality changes.[6]

2) The pass-through into consumer clothing/footwear prices from import and producer prices

Following the approach adopted in Section 2.4, the pass-through from producer and import prices is estimated, using both domestic and euro area producer and import prices because, in some countries, domestic production may be relatively small and its correspondence with consumption relatively weak. Furthermore, the import price measure used (UVI) is highly volatile, particularly at the country level – see Chart D for the euro area aggregate.

3 Imports from China were a notable exception to the elimination of clothing and footwear trade restrictions in January 2005, as they remained subject to gradually easing quantitative restrictions until the end of 2008. These restrictions were based on the special provisions accepted by China upon its entry to the World Trade Organisation (WTO) in 2001. See also Commission Regulation (EC) No 502/2008 of 5 June 2008: http://trade.ec.europa.eu/doclib/html/139337.htm

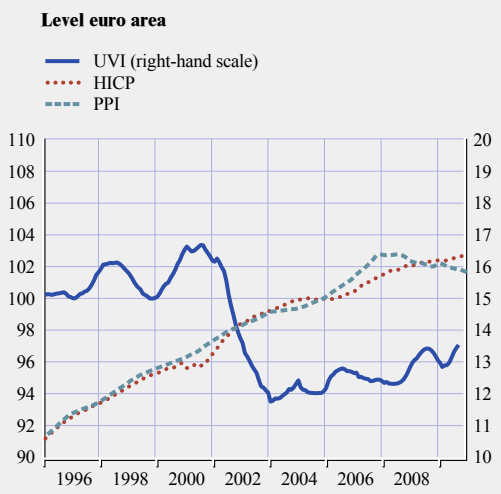
4 For estimates of the tariff equivalents of pre-2005 import quotas and actual quota utilisation rates, see Nordas (2004).

5 See also ECB (2008).

6 To some extent, the price decline observed in textiles may reflect downward pressure stemming from the substitution of more expensive imports with cheaper ones, particularly from China. The unit values of euro area imports of clothing and footwear indicate that imports from China are, on average, cheaper than those from European or North African trading partners. Temporary quality downgrading – a regular response to the removal of import quotas – may also have played a role (see Brambilla et al. (2010)).

Chart D Euro area clothing and footwear price developments

(index 2005 = 100; euro per kg)



Sources: Eurostat's HICP, STS and COMEXT databases and Eurosystem staff calculations.

For some countries (especially the smaller ones, e.g. Belgium, Ireland, Luxembourg, Austria and Portugal), aggregate euro area producer and import prices appear to capture input price pressures better, as the coefficients on the country-specific producer and import price series are often not significant. Also, for clothing consumer prices, it is difficult to find statistically significant pass-through coefficients for eight of the 15 countries. Lastly, the pass-through coefficients are generally much larger for producer prices than for import prices. This may reflect the fact that (1) clothing and footwear imports, although growing rapidly, still account for around a third of consumption, (2) the clothing and footwear import price data are relatively noisy and (3) the producer price series may also be capturing some of the more general price pressures in each country. The low estimates for import price pass-through may also reflect the substantial increase in the share of imports from China after 2005. Therefore, the "China effect" (low price levels and increasing market share) may not be adequately captured. [7]

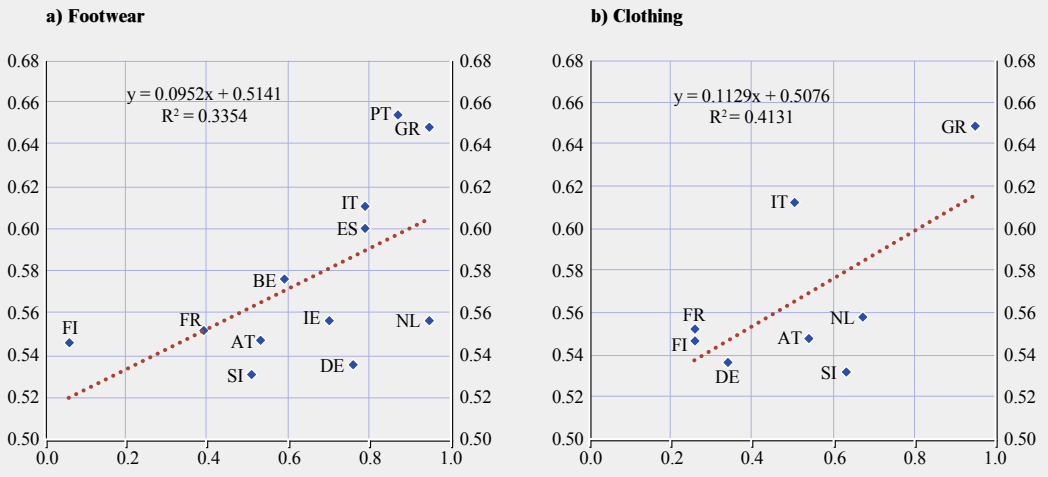
Chart E shows that the estimated combined pass-through rates from import and producer prices vary considerably across euro area countries, while the a priori relationship with the share of the cost of goods sold is subject to considerable deviations. Regarding the relationship between the pass-through and structural features of clothing and footwear markets in individual countries, the correlation with indicators such as the degree of concentration (HHI or C(x)), profit margins or product market regulation indicators tends to be weak.[8] There is some tentative evidence, however, to suggest that profit margins have increased in the euro area clothing and footwear sectors – perhaps reflecting a fall in import prices that has not been passed through fully into consumer prices – as the share of the cost of goods sold declined from around 60% in 1999 to around 55% in 2007. The share of non-labour operating costs (e.g. rents, fixtures and fittings, etc.) increased somewhat from around 17% to 20% over the same period, thus offsetting some of the benefit from lower import prices.

Overall, differences in consumer clothing and footwear price levels across the euro area continue to persist, albeit at a relatively low level compared with other products (see Section 2.1). Furthermore, although the annual rate of change in clothing and footwear prices has been

7 For Norway, Benedictow and Baug (2010) find that the "China effect" (i.e. allowing for varying import shares and differences in price levels in addition to inflation differences) has had an important effect since the 1990s. However, clothing and footwear prices in Norway are still relatively high at around 35% above average euro area levels. Kowalski (2009) highlights the difficulties in quantifying the impact of the phase-out of the MFA. On the one hand, even when China faced temporary restraints in its exports to the EU and US markets in 2005, a significant increase in imports of apparel from China was observed. On the other hand, in 2008 there was a significant drop in imports from all trading partners in textiles and clothing, owing to consumer confidence, financing issues and the global economic slowdown. Overall, the statistical evidence points to the rather long-run character of the adjustment process both in the OECD countries and in producing developing countries.

8 It should be noted that there are very few observations to test this relationship.

Chart E Correlation between the estimated pass-through of import and producer prices, and the share of the cost of goods sold



Source: Eurosystem staff calculations.

relatively moderate across the euro area, despite a substantial increase in the share of clothing and footwear imports from low-cost countries, permanent declines in consumer prices have only been observed in a small number of euro area countries. The analysis suggests that there is ample room for further improving competition in this sector, particularly at the post-production, wholesale and retail levels. In particular, measures to encourage further online and cross-border retailing and the full implementation and enforcement of the services directive could help to ensure that the benefits from trade liberalisation in terms of increased productivity and lower consumer prices would be passed on more completely to consumers.

2.4.2 FOOD PRICE PASS-THROUGH AND STRUCTURAL FEATURES OF THE GROCERY MARKET FOR MAJOR EURO AREA ECONOMIES

The primary objective of this section is to assess whether retailers pass through upstream cost increases to final food prices and, if so, how and to what extent. Furthermore, the extent to which cross-country market differences matter for this process is analysed.

The nature of the link between the degree of competition in the retail distribution sector and the size of pass-through is not immediate a priori. It has been argued that the transmission of an exogenous shock is, to a large extent, determined by the competition of the retail environment and the composition of retailing channels. Nakamura et al. (2010) have documented large differences in price movements across store chains, implying that, in addition to product characteristics, the type of retailer can be a crucial determinant of pricing dynamics. Moreover, fiercer competition among retailers may lead to a faster and stronger pass-through, since margins are narrower and firms are forced to pass on cost changes.[132] Retailers can be involved in competition, in which both

132 Hall et al. (2000) find that firms in competitive markets tend to adjust prices faster and Weiss (1995) stresses that cost changes are passed through more fully in less concentrated industries. Alvarez and Hernando (2007) suggest that the price-setting strategies of the most competitive firms in the euro area account for the greatest flexibility in their own prices. On the contrary, a high degree of competition may oblige companies to partially retain cost increases reducing margins. For example, Berck et al. (2009) interpret the large elasticities as a signal for imperfect competition, implying that companies can pass through costs.

the composition of retailer type and the number of companies matters (see Cleeren et al. (2008)).

This investigation of the pass-through focuses on the reaction of consumer and industrial producer prices to shocks in European farm-gate prices.[133] The study will focus on selected countries (BE, DE, ES, FR, IT) and food products (dairy, oils and fats,[134] bread and cereals, and meat).[135] Although the choice of countries has been dictated by data availability, there is sufficient variation in the retail structure across these countries for a detailed analysis. Also, the selection of food categories is based upon the ability to match agricultural prices with industrial producer and consumer prices. Overall, they represent about 10% of the overall HICP basket and almost 60% of the HICP for food excluding alcohol and tobacco.[136]

In the past the Common Agricultural Policy of the European Union (CAP) had moderated the effect of fluctuations in world market prices on internal EU prices via various mechanisms, most importantly price guarantees. With the surge in world market prices between 2006 and mid-2008, as well as the simultaneous rolling back of the CAP, this was no longer the case. As a result, perceptible rises were recorded in producer and consumer prices of food products across all the countries and food items under consideration (see Chart 19).[137] Prices of dairy products and of oils and fats displayed the largest response, increasing in cumulated terms by almost 20% in Germany and around 8% in Italy, the country with the smallest response, relatively speaking. For bread and cereal products, Belgian consumers were faced with the highest price rises, at 12%, whereas French consumers only had to bear a 5% increase. Consumer price increases for meat lay between 5% and 8%.

A formal analysis based on impulse response functions from vector autoregression (VAR) models[138] confirms the evidence stemming from the quantitative inspection of the data (Chart 20). Overall, consumer prices in Germany, Belgium and, to a lesser extent, Spain show a strong response to variations in farm-gate prices – particularly with dairy products, including oils and fats – whereas reactions in France and Italy are more muted. In line with their position along the pricing chain, industrial producer prices display an earlier response than consumer prices, with the reaction at both levels being quickest in Germany. The impact of a shock is also stronger at the producer level, as the agricultural commodity should have a higher share in overall costs. At the consumer level, where other costs, such as those associated with running a retail outlet, or taxes, are added, the response to a shock is less pronounced. Overall, these results resemble three features already supported by other evidence in the literature, namely: the food price pass-through varies across product categories (Vavra and Goodwin (2005)); the food price pass-through varies across countries (IMF (2008)); and the pass-through to producer

133 European (EU-27) farm-gate prices are average prices (in euro), which are published on a monthly basis by the European Commission for Agriculture and Rural Development. They encompass several data series for different groups of agricultural commodities (cereals, dairy products, oils and fats, and meat products). These series are available from 1997 onwards for both individual countries and as a cross-country average. The latter are used to ensure that potentially different responses in industrial producer and consumer prices truly follow from diversities in the retail structure and not from variations in the underlying commodity price shock. The data can be accessed under http://ec.europa.eu/agriculture/foodprices/index_en.htm

134 Dairy products have been merged with oils and fats, owing to the fact that, although data are available separately for dairy products and for oils and fats at the farm gate and regarding HICP levels, they are combined at the producer price level.

135 For an analysis on the euro area as a whole, see Ferrucci et al. (2010).

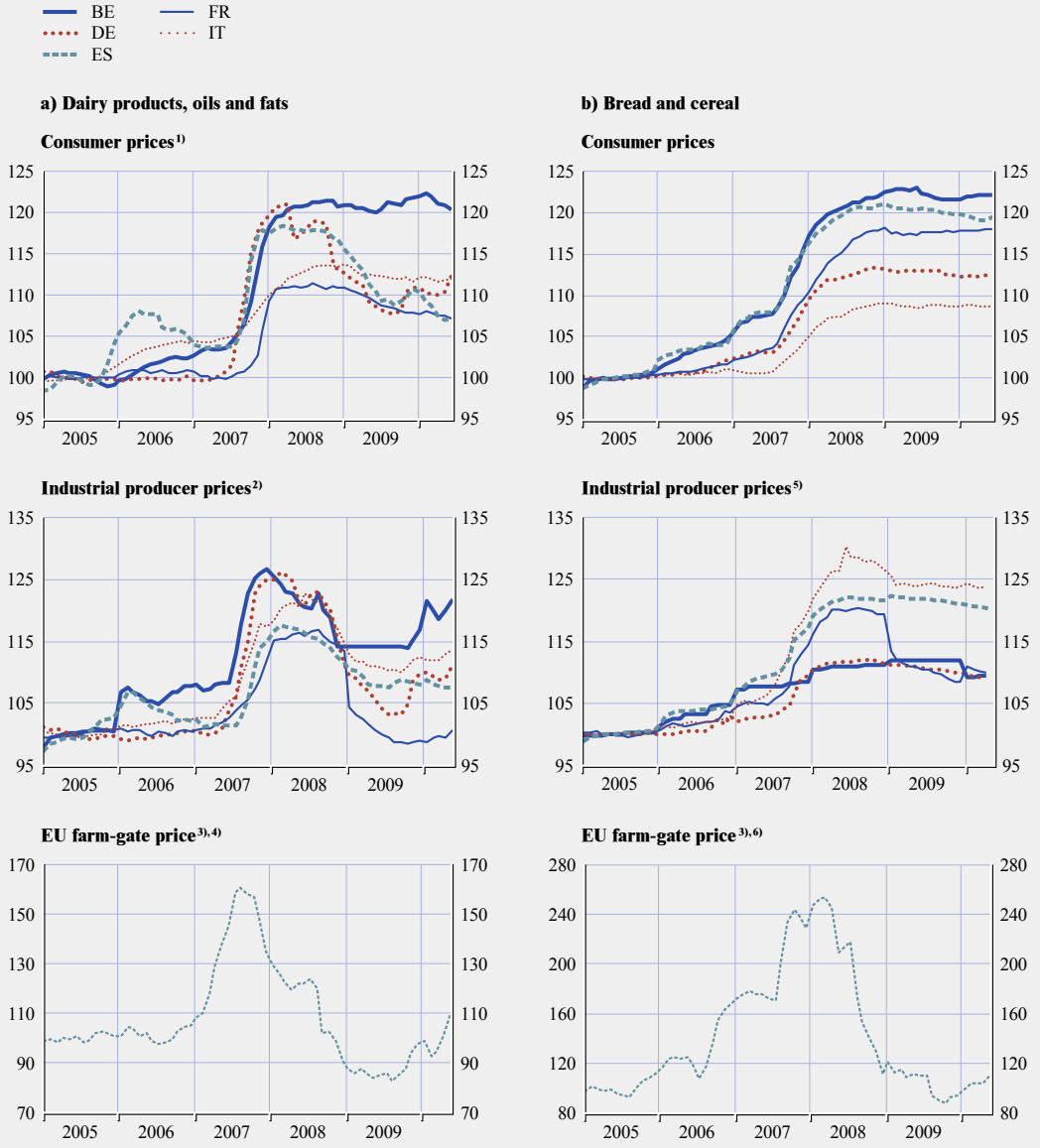
136 In terms of average weights between 1997 and 2010.

137 Ferrucci et al. (2010) and Landau et al. (2009) have already stressed the importance of non-energy commodity prices as a determinant of euro area retail and producer prices.

138 The analysis has been conducted on the full sample. However, a cross-check has been run, excluding the surge in prices that started in 2006. The pass-through from commodity prices to consumer and producer prices becomes less statistically significant. This can be related to the effect of the CAP. Significant and positive impulse responses are – with the exception of meat, for which support prices had been abolished in early 2000 – mostly due to the latter part of the sample period, which entails the most recent hike in food prices. Still, since EU farm-gate prices explicitly take into account the changing role of the CAP, estimating VAR models over the entire sample should not be a problem. Note that seasonality is not controlled for as evidence of significant seasonality is limited for processed food prices, unlike unprocessed food prices.

Chart 19 Price developments at different stages of the production chain

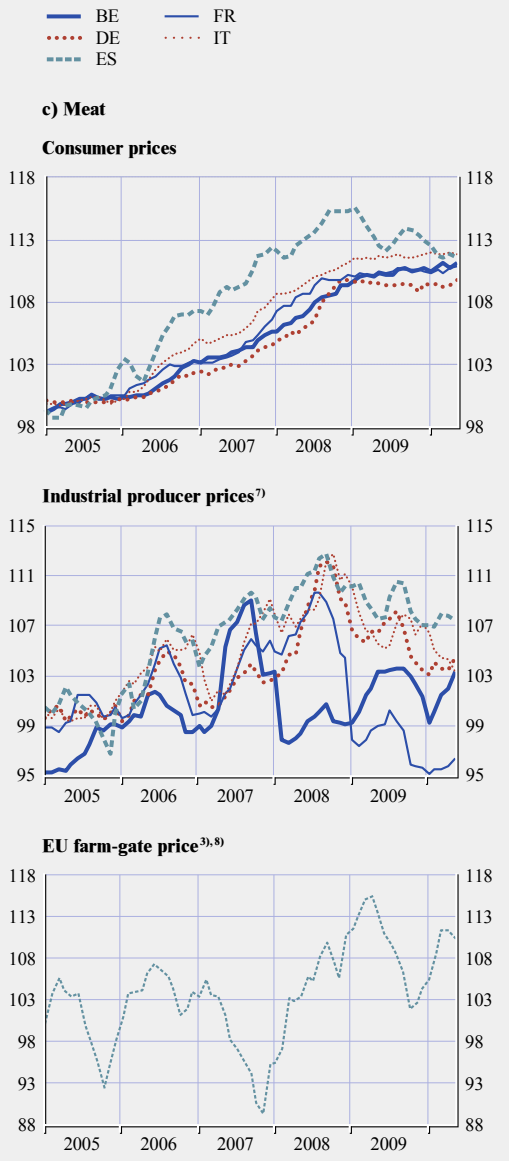
(2005 = 100, non-adjusted data)



Sources: Eurostat and European Commission (DG Agriculture and Rural Development).
1) HICP milk, cheese and eggs as well as HICP oils and fats aggregated with country-specific HICP weights.
2) Manufacture of dairy products, and manufacture of animal oils and fats aggregated with country-specific CPI weights for respective country groups.
3) Average prices in euro indexed to 2005 = 100.
4) Skimmed milk powder and olive oil aggregated with cross-country average of CPI weights for respective product groups.
5) Manufacture of bakery and farinaceous products, and manufacture of starches and starch products aggregated with country-specific weights for respective product groups.
6) Rye of bread-making quality.
7) Processing and preservation of meat products.
8) Beef, veal, pork and poultry aggregated with cross-country shares in total consumption (source: Euromonitor).

Chart 19 Price developments at different stages of the production chain (cont'd)

(2005 = 100, non-adjusted data)



Sources: Eurostat and European Commission (DG Agriculture and Rural Development).
1) HICP milk, cheese and eggs as well as HICP oils and fats aggregated with country-specific HICP weights.
2) Manufacture of dairy products, and manufacture of animal oils and fats aggregated with country-specific CPI weights for respective country groups.
3) Average prices in euro indexed to 2005 = 100.
4) Skimmed milk powder and olive oil aggregated with cross-country average of CPI weights for respective product groups.
5) Manufacture of bakery and farinaceous products, and manufacture of starches and starch products aggregated with country-specific weights for respective product groups.
6) Rye of bread-making quality.
7) Processing and preservation of meat products.
8) Beef, veal, pork and poultry aggregated with cross-country shares in total consumption (source: Euromonitor).

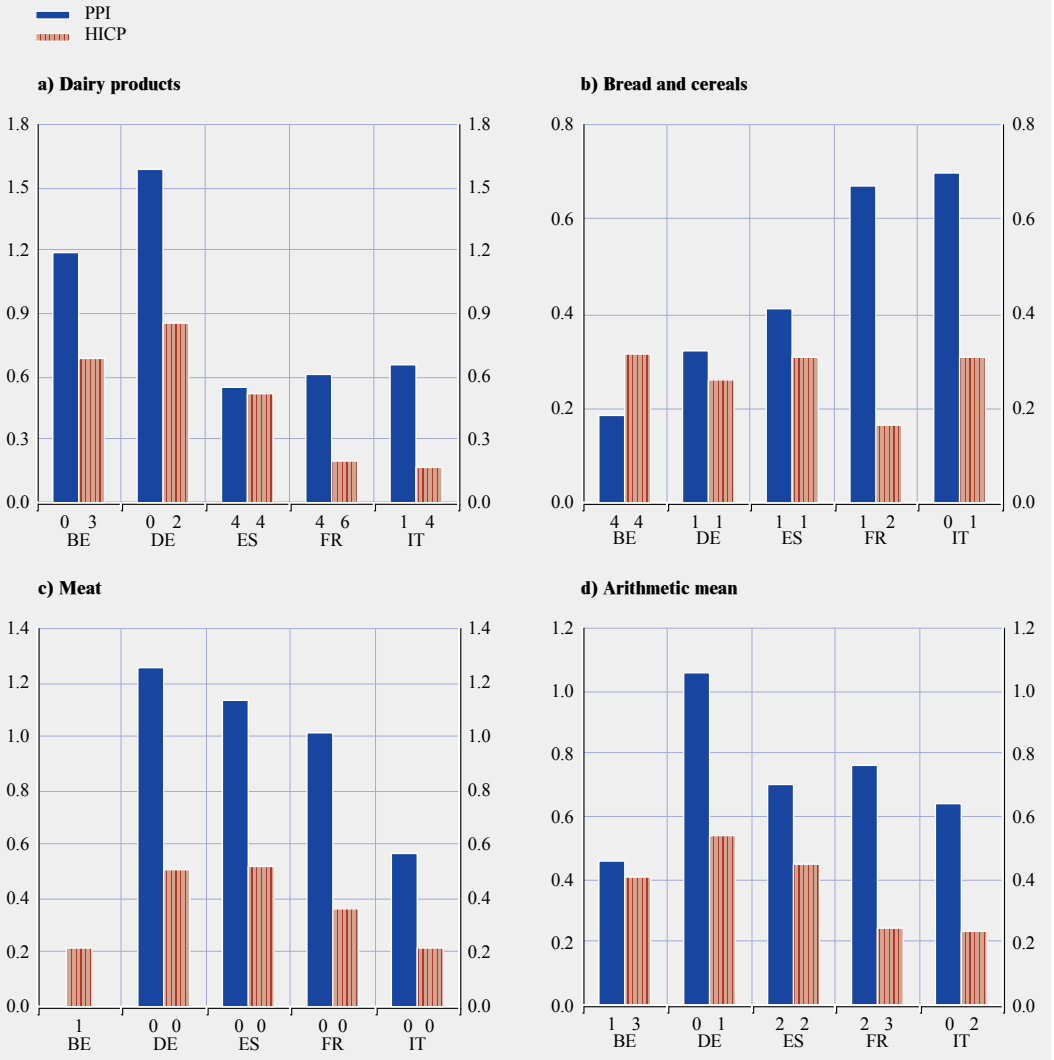
prices is higher than to consumer prices (Bukeviciute et al. (2009)).

Against this background, the VAR analysis results can be tentatively related to the varying importance of different retail channels. For example, processing costs may tend to be passed through more heavily and earlier in countries where discounters have a stronger presence. As already illustrated in the first chapter, the market share of discounters is by far the highest in Germany, making up almost 40% of the overall retail grocery market in 2009. In the other selected euro area countries, this share was less than 10% between 1999 and 2009 on average, while in Italy, Belgium and, to a lesser extent, Spain, specialised and small grocery retailers – which are most likely owner-run, given the high share of self-employment (see also Chapter 1) – play a relevant role. These types of retailers may interact in more localised and niche markets, with potentially higher margins related to the customisation of products and services. Evidence from oils and fats, as well as meat markets, suggests that retailers in Italy, Belgium and Spain have higher profit margins on average (see Chart 21). This feature may allow for a delayed response to a shock, since they have a potentially higher cushion for absorbing temporary cost shifts originating from the food chain.

More specifically, the same retailers' distribution by type of seller is reflected in the market-specific breakdown for dairy products, oils and fats, and bakery products (see Chart 22). On average, Germany has the highest share of discounters, ranging between 30% and 40% of the market in terms of expenditure shares. The bakery product market differs from the grocery market as a whole. Sellers are predominantly other grocery retailers,[139] such as bakeries,

139 This category includes kiosks; markets selling predominantly groceries; food and drink souvenir stores and regional speciality stores; food/drink/tobacco specialists; bakers (bread and flour confectionery); butchers (meat and meat products); fishmongers (fish and seafood); greengrocers (fruit and vegetables); drinks stores (alcoholic and non-alcoholic drinks); tobacconists (tobacco products and smokers' accessories); cheesemongers; and chocolatiers and other single food categories. Moreover, direct home delivery, e.g. of milk/meat from farms/dairies, is included.

Chart 20 Impact of a shock in agricultural prices on industrial producer and consumer food prices



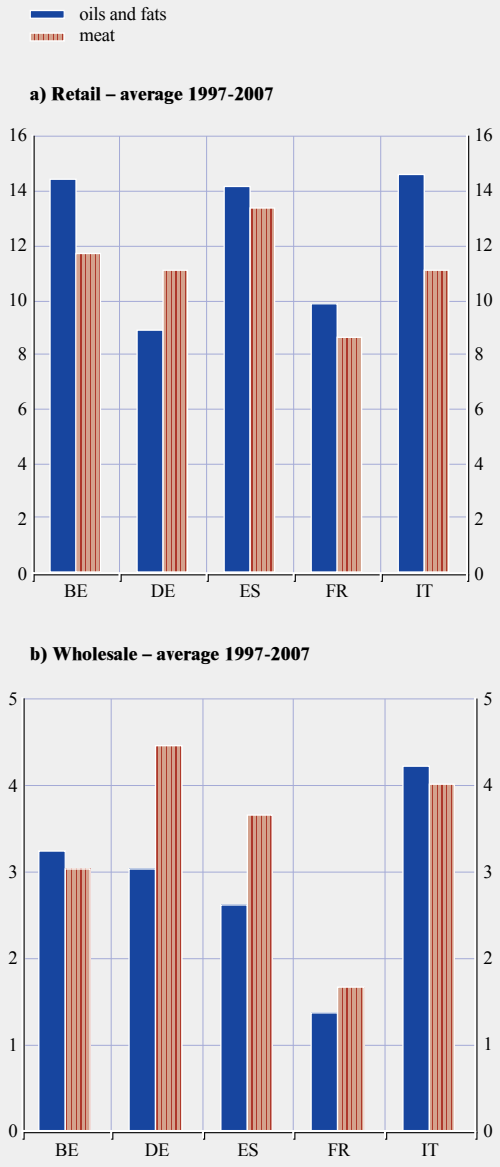
Notes: The number below the bar indicates the start of the pass-through.
VAR models are used to estimate the dynamic relationship between euro area farm-gate prices and country-specific industrial producer and consumer prices. Equation systems are specified for each market and country:

$$\Delta y_t = c + \sum_{i}^{p} Ai\, \Delta y_{t-i} + \varepsilon_t$$

Δy_t includes euro area farm-gate prices, as well as industrial producer and consumer prices, and is estimated on monthly changes with the ordinary least squares method. The lag length i is selected using standard criteria such as the Akaike Information Criterion (AIC) and the Schwarz Information Criterion (SC). The average lag length selected by these criteria is around four.
The system is identified using the Cholesky decomposition. The ordering of the variables follows from their position in the pricing chain, i.e. shocks in farm-gate prices have a contemporaneous effect only on producer prices, and shocks in producer prices only on consumer prices. *Impulse response functions* show the behaviour of producer and consumer prices in reaction to a shock in agricultural commodity prices over a certain period of time. Here, the shock is set equal to one standard deviation, i.e. the amount by which price changes in agricultural products spread around their mean value. As these shocks have a common magnitude and statistical properties, differences in the impulse response functions should originate from the market structure.
The cumulated impact is the sum of the impulse responses which are significantly different from zero with a 95% probability.
It needs to be considered that the impulse response functions refer to an aggregate of consumer prices, in which the composition of products and their respective share varies across countries. For example, it has been shown for German dairy product prices that the pass-through of a commodity shock is stronger with less refined dairy products, as they have a higher commodity content (see Deutsche Bundesbank (2009)). Thus, composition effects in consumer prices may also influence cumulated impulse responses.

Chart 21 Profit margins in the retail and wholesale market for oils and fats, and meat

(percentage; average 2001-2009)



Sources: Eurostat SBS.
Note: Profit margins measured as gross operating surplus to total turnover.

Chart 22 Market shares for single products by retail type

(percentage of total retail value (retail selling price); average 2001-2009)

Source: Euromonitor.

which are localised shops, mainly characterised by internal production. The estimated pass-through in the VAR analysis is lower than for the other food categories on average. Among the selected countries, France has the lowest pass-through. This is reflected in the highest average market size of "Other grocery retailers".

The VAR analysis has shown that producer prices react faster and more strongly to

Table 23 Statistics on the integration of retail and wholesale in the packaged food markets, and some structural characteristics of the upstream market

(percentage of total retail value, average 2001-2009)

	Market share			
	Number of retail companies which are also producers of packaged food	Total retail market share of grocery retailers producing own products (packaged and fresh food)	Market share of packaged food produced by retail companies	Market share of packaged food produced by artisanal companies and other producers[1]
BE	4	46.6	17.4	44.0
DE	4	35.6	20.3	40.1
ES	6	46.6	8.0	40.2
FR	4	41.0	9.8	46.2
IT	4	25.1	1.5	60.7

Source: Euromonitor.
1) Producers that have never had a market share equal to or higher than 1% between 2001 and 2009.

commodity price shocks (see Chart 2). On the one hand, quicker and higher pass-through may be related to greater efficiency and/or lower margins. On the other hand, it may also be a feature that depends on the interplay between the upstream and downstream sides of the market (see Chapter 1). Producers can also be sellers of their own products in the retail market. The number of companies with a relevant market share[140] of their own-produced packaged food is limited in each country. These companies also have a high average market share of the grocery market for the whole range of grocery products (see Table 23). These features, together with a less dispersed and more efficient production organisation, may make it easier to pass on a cost shock. Roughly 20% of the packaged food sold on the market is produced by firms that are also retailers in Germany. This can be a consequence of the dominance of discounters at the retail level, which is also reflected in a high degree of vertical interconnection between upstream and downstream markets and the higher penetration of – generally cheaper – private labels (see Section 1.1). This feature is less evident in Spain, Italy and France, where more traditional retailing channels are accompanied by a more fragmented producer level.

In conclusion, the VAR analysis shows that consumer prices tend to respond less than producer prices to commodity shocks. It has been found that the size of the shock varies across markets and countries, as also stressed in Ferrucci et al. (2010). This feature is partially reflected in cross-sectional differences between retailers and producers in terms of composition and types. A more pronounced presence of discounters seems more likely to be associated with a high pass-through while, conversely, markets characterised by shops with a smaller format seem to be less sensitive to commodity price shocks. This does not, however, imply that a higher or lower pass-through per se is a clear signal of the extent of competition in the underlying market.

140 Above 1% in terms of retail expenditure shares.

ANNEXES

I ADDITIONAL COUNTRY DATA AND BACKGROUND INFORMATION

Table A1 Summary statistics for grocery retailers in the euro area (2009)

	Stores	Sq. m.	Sq. m. per store	Stores per 1,000 capita	Sq. m. per 1,000 capita	Real sales (1,000) per store	Real sales per sq. m.	Stores per 100 sq. km.	Selling space (sq. m.) per 100 sq. km.
Belgium	24,808	5,886	237	2.3	546	1,224	5,157	81	19
Germany	107,965	39,941	370	1.3	488	1,480	4,000	30	11
Ireland	8,764	1,957	223	2.0	439	1,441	6,450	12	3
Greece	76,763	5,578	73	6.8	495	367	5,047	58	4
Spain	157,968	21,091	134	3.4	459	648	4,852	31	4
France	93,284	28,546	306	1.4	443	1,866	6,097	17	5
Italy	260,204	25,512	98	4.3	423	432	4,404	86	8
Cyprus [1]	3,744	755	202	4.7	946	321	1,592	40	8
Luxembourg [1]	1,040	325	313	2.1	654	1,127	3,601	40	13
Malta [1]	1,074	94	87	2.6	226	436	5,006	340	30
Netherlands	33,637	5,702	170	2.0	345	915	5,399	81	14
Austria	12,894	3,952	306	1.5	473	1,422	4,639	15	5
Portugal	40,828	5,217	128	3.8	491	564	4,414	44	6
Slovenia	2,177	815	374	1.1	399	1,725	4,607	11	4
Slovakia	25,656	2,754	107	4.7	508	341	3,173	53	6
Finland	6,294	2,915	463	1.2	546	1,980	4,275	2	1
Euro area	**857,100**	**151,039**	**176**	**2.6**	**459**	**890**	**5,053**	**33**	**6**

Sources: Eurostat, Euromonitor and Eurosystem staff calculations.
Notes: (1) Figures may differ from official national sources, owing to differences in definition, threshold for consideration, etc. (2) Real sales per store have been adjusted using purchasing power parities.
1) Modelled countries (means data constructed by Euromonitor using econometric techniques rather than based on official sources).

Table A2 Demographic statistics (1998-2006)

		G sector – distributive trades											
		EA	AT	BE [1]	FI	FR [1]	DE	IE [1]	IT	NL	SK	SI	ES
Zero	Growth	-1.4	0.6	-0.4	0.2	3.2	-0.7	-8.4	-1.5	6.9	3.2	6.0	-0.9
	Birth rate	9.4	11.4	6.4	13.6	12.8	13.9	6.1	8.1	12.9	17.5	13.5	11.1
	Death rate	8.3	11.1	6.5	13.7	9.9	16.2	14.5	8.3	11.7	16.2	12.3	9.5
	Net turnover	1.1	0.3	-0.1	-0.1	2.9	-2.3	-8.4	-0.2	1.2	1.3	1.2	1.6
	Reallocation	-2.5	0.3	-0.4	0.3	0.2	1.6	0.0	-1.3	5.7	1.9	4.8	-2.5
1 to 4	Growth	-0.8	0.6	-1.0	-1.1	-2.2	1.0	3.3	1.7	-12.9	4.3	-5.0	0.7
	Birth rate	4.3	5.2	3.5	2.6	4.0	6.4	6.0	2.3	5.1	7.1	4.8	4.8
	Death rate	4.5	4.4	3.1	2.3	5.8	2.8	3.2	3.3	5.9	6.0	6.1	5.1
	Net turnover	-0.2	0.8	0.4	0.3	-1.8	3.5	2.7	-1.0	-0.8	1.1	-1.2	-0.3
	Reallocation	-0.7	-0.1	-1.4	-1.4	-0.4	-2.5	0.6	2.7	-12.1	3.2	-3.8	1.1
5 to 9	Growth	1.1	-0.5	1.3	1.5	-0.7	-1.2	0.5	3.5	4.6	0.4	-0.9	3.8
	Birth rate	1.9	2.4	1.2	0.4	1.0	1.5	1.1	0.9	2.3	3.0	2.1	3.3
	Death rate	1.8	1.5	0.7	0.6	2.7	0.6	0.6	0.7	3.5	3.3	1.4	2.4
	Net turnover	0.2	1.0	0.5	-0.2	-1.7	1.0	0.6	0.2	-1.2	-0.3	0.7	0.9
	Reallocation	0.9	-1.5	0.8	1.7	1.0	-2.1	-0.1	3.2	5.9	0.7	-1.7	2.8
10 or more	Growth	1.4	0.8	2.2	2.7	0.8	-0.1	0.7	3.7	3.1	-1.3	2.4	2.6
	Birth rate	1.1	1.3	0.8	0.1	1.1	0.7	0.5	0.5	1.5	2.7	1.0	1.4
	Death rate	1.2	0.5	0.3	0.2	2.6	0.4	0.2	0.3	2.3	3.4	0.6	1.1
	Net turnover	-0.1	0.8	0.4	0.0	-1.5	0.3	0.3	0.2	-0.8	-0.7	0.4	0.3
	Reallocation	1.5	0.0	1.8	2.7	2.3	-0.4	0.5	3.5	3.9	-0.6	1.9	2.3
Total	Growth	0.1	0.6	-0.3	-0.1	0.1	-0.3	-1.2	-0.5	0.6	2.3	-0.6	0.4
	Birth rate	7.9	6.7	5.0	8.8	8.3	9.4	4.1	6.9	7.6	12.6	7.6	8.2
	Death rate	7.2	6.0	5.0	8.7	7.6	9.3	5.8	6.9	8.0	11.1	7.7	7.2
	Net turnover	0.8	0.6	0.0	0.0	0.7	0.0	-1.7	0.0	-0.5	1.5	0.0	1.0
	Reallocation	-0.7	0.0	-0.3	-0.2	-0.6	-0.3	0.5	-0.5	1.1	0.8	-0.6	-0.5

Sources: Eurostat (SBS on business demographics) and Eurosystem staff calculations.
1) Data for Belgium, France and Ireland relate to 2007, as 2006 data are not available, while 2006 is the last available year for all the other countries. Zero denotes one-man businesses. Net turnover is calculated as births minus deaths, while reallocation is measured as growth minus net turnover.

Table A3 Shift and share analysis of turnover growth

Employment class	Country	Productivity	Size	Distribution	Sector	Total
1-19	EA	-0.03	0.17	-0.04	1.00	1.10
	AT	0.50	-1.50	0.10	3.60	2.60
	BE	-2.90	0.40	-0.10	-0.70	-3.20
	DE	1.90	1.20	-0.10	-0.20	2.90
	ES	-3.00	0.80	-0.10	2.20	0.00
	FI	3.60	0.20	-0.10	0.10	3.90
	FR	-0.70	-1.60	0.10	1.50	-0.70
	IT	-1.60	1.10	0.00	-0.20	-0.70
	NL	2.60	-1.00	-0.10	3.60	5.00
	SI	1.40	-1.60	0.00	0.70	0.50
20+	EA	-0.27	0.50	1.67	1.00	2.91
	AT	0.50	0.10	-1.80	3.60	2.40
	BE	-2.60	1.00	2.60	-0.70	0.30
	DE	1.80	0.10	1.10	-0.20	2.80
	ES	-2.50	2.40	3.20	2.20	5.20
	FI	0.90	1.70	1.80	0.10	4.60
	FR	-1.00	2.60	-1.90	1.50	1.20
	IT	-1.80	2.50	4.00	-0.20	4.50
	NL	3.80	-1.40	2.10	3.60	8.10
	SI	2.10	-0.60	0.20	0.70	2.40

Sources: Eurostat (SBS) and Eurosystem staff calculations.
Notes: Labour productivity defined as real turnover per person employed (thousands of euro), deflated using the price indices for gross output from EU KLEMS.

Table A4 Cost structure – retail trade sub-sectors

(percentages)

	G52 Retail trade	G521 Retail – non-specialised	G5211 Retail – non-specialised (grocery)	G5212 Retail – non-specialised (other)	G522 Retail – specialised (food, drink and tobacco)	G523 Retail – specialised (pharma.)	G524 Retail – specialised (other)
Turnover/sales (excluding taxes)	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Costs of goods sold	66.7	73.6	74.6	63.1	63.0	67.5	61.3
Gross margin	33.3	26.4	25.4	36.9	37.0	32.5	38.7
Other costs	14.8	11.4	11.1	14.8	16.7	11.0	17.7
Value added	18.5	15.0	14.3	22.1	20.3	21.5	21.0
Labour costs – unadjusted	11.6	10.2	9.7	15.3	10.0	12.3	13.4
- Wages and salaries	9.0	8.0	7.6	12.2	7.7	9.5	10.5
- Social security contributions	2.5	2.2	2.1	3.1	2.3	2.9	2.9
Profits – unadjusted	6.9	4.8	4.6	6.8	10.3	9.2	7.6

Table A5 Cost structure – "other specialised retail trade" sub-sectors

(percentages)

	G5241 Retail – specialised (other) textiles	G5242 Retail – specialised (other) clothing	G5243 Retail – specialised (other) footwear	G5244 Retail – specialised (other) furniture	G5245 Retail – specialised (other) elec./appl.	G5246 Retail – specialised (other) DIY	G5247 Retail – specialised (other) print	G5248 Retail – specialised (other) other
Turnover/sales (excluding taxes)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Costs of goods sold	55.5	56.5	56.7	59.1	71.6	62.6	62.3	62.5
Gross margin	44.5	43.5	43.3	40.9	28.4	37.4	37.7	37.5
Other costs	21.3	19.8	19.9	19.3	14.1	17.2	18.3	16.1
Value added	23.2	23.6	23.4	21.7	14.2	20.2	19.4	21.4
Labour costs – unadjusted	13.9	14.8	14.4	14.4	10.7	12.6	11.3	13.5
- Wages and salaries	10.8	11.6	11.2	11.3	8.4	9.9	8.7	10.5
- Social security contributions	3.0	3.2	3.2	3.1	2.3	2.7	2.5	2.9
Profits – unadjusted	9.3	8.9	9.0	7.3	3.5	7.6	8.2	7.9

Table A6 Cost structure – grocery retail across countries

(percentages)

Grocery retail	EA	BE	DE	IE	GR	ES	FR	IT
Turnover/sales (excluding taxes)	100	100	100	100	100	100	100	100
CoGS	75	77	74	75	83	78	79	62
Gross margin	25	23	26	25	17	22	21	38
Other costs	11	9	9	7	5	5	9	25
Value added	14	14	16	18	14	16	12	14
Labour costs – unadjusted	10	9	10	13	8	11	9	10
- Wages and salaries	8	7	8	11	6	8	7	7
- Social security contributions	2	2	2	1	2	2	2	3
Profits – unadjusted	5	5	6	5	6	6	3	4

Grocery retail	CY	LU	NL	AT	PT	SI	SK	FI
Turnover/sales (excluding taxes)	100	100	100	100	100	100	100	100
CoGS	83	75	76	73	82	71	78	75
Gross margin	17	25	24	27	18	29	22	25
Other costs	5	10	10	11	6	13	9	11
Value added	13	15	14	16	13	15	13	14
Labour costs – unadjusted	8	8	10	13	8	11	9	9
- Wages and salaries	7	7	8	10	7	9	7	8
- Social security contributions	1	1	2	3	2	1	2	2
Profits – unadjusted	5	6	4	3	4	5	4	5

Table A7 Cost structure – grocery retail across countries

(percentages)

Non-grocery retail	EA	BE	DE	IE	GR	ES	FR	IT
Turnover/sales (excluding taxes)	100	100	100	100	100	100	100	100
CoGS	62	64	62	63	70	67	61	55
Gross margin	38	36	38	37	30	33	39	45
Other costs	17	19	15	14	12	11	18	26
Value added	21	17	23	23	18	22	22	18
Labour costs – unadjusted	13	9	15	15	8	12	15	9
- Wages and salaries	10	7	12	13	7	10	11	6
- Social security contributions	3	2	3	2	2	3	4	2
Profits – unadjusted	8	8	8	8	9	10	6	10

Non-grocery retail	CY	LU	NL	AT	PT	SI	SK	FI
Turnover/sales (excluding taxes)	100	100	100	100	100	100	100	100
CoGS	67	72	61	62	69	63	69	66
Gross margin	33	28	39	38	31	37	31	34
Other costs	11	19	16	15	14	18	17	15
Value added	22	9	23	22	17	19	14	20
Labour costs – unadjusted	14	4	13	15	12	10	7	13
- Wages and salaries	13	4	11	12	9	9	5	10
- Social security contributions	1	0	2	3	2	1	1	3
Profits – unadjusted	8	5	10	7	6	8	8	7

Table A8 Selected concentration measures

(grocery sector; averages 2004-2009)

	HHI	Rank	CR_1	Rank	CR_3	Rank	CR_5	Rank	CR_9	Rank
BE	5.9	*6*	14.3	*5*	38.5	*6*	50.2	*6*	57.0	*6*
DE	10.2	*8*	17.8	*7*	47.1	*8*	66.9	*11*	75.9	*11*
IE	11.6	*9*	23.1	*10*	54.2	*10*	64.7	*9*	75.5	*10*
GR	1.4	*1*	9.1	*1*	16.8	*1*	22.8	*1*	27.7	*1*
ES	3.8	*3*	12.9	*3*	29.2	*3*	38.9	*3*	45.6	*2*
FR	8.6	*7*	21.3	*8*	41.7	*7*	58.5	*8*	71.0	*8*
IT	3.3	*2*	9.9	*2*	22.0	*2*	32.4	*2*	48.0	*3*
NL	11.6	*10*	30.3	*11*	48.4	*9*	56.4	*7*	64.4	*7*
AT	11.9	*11*	22.8	*9*	57.0	*11*	65.3	*10*	74.1	*9*
PT	4.9	*4*	13.4	*4*	33.1	*4*	45.7	*5*	53.8	*5*
SI	24.3	*12*	41.7	*13*	74.5	*12*	86.8	*12*	94.9	*12*
SK	5.5	*5*	17.1	*6*	36.2	*5*	45.0	*4*	51.0	*4*
FI	24.4	*13*	35.9	*12*	76.5	*13*	88.9	*13*	95.9	*13*
EA	**2.3**	*2*	**9.1**	*2*	**18.7**	*2*	**27.1**	*2*	**39.3**	*2*
Average	**9.8**	*8*	**20.7**	*8*	**44.2**	*8*	**55.6**	*7*	**64.2**	*7*
Correlation with HHI			*0.97*		*0.99*		*0.94*		*0.92*	

Sources: Euromonitor (2011) and Eurosystem staff calculations.

Table A9 HHI across sectors

(average 2004-2009)

	Groc.	Rank	H&B	Rank	C&F	Rank	H&G	Rank	E&A	Rank	L&P	Rank
BE	5.9	6	0.8	7	1.3	6	2.3	7	2.6	2	0.8	6
DE	10.2	8	1.6	9	2.5	8	2.5	8	20.0	11	1.4	9
IE	11.6	9	1.7	10	1.3	5	0.9	5	19.6	10	1.0	8
GR	1.4	1	0.7	6	0.7	4	0.3	1	3.4	3	0.5	4
ES	3.8	3	0.1	3	3.0	10	0.7	3	8.2	7	0.2	2
FR	8.6	7	0.2	4	0.7	3	3.9	10	2.4	1	1.9	10
IT	3.3	2	0.1	1	0.3	2	0.6	2	7.7	5	0.4	3
NL	11.6	10	3.1	12	2.0	7	2.3	6	7.8	6	0.8	5
AT	11.9	11	3.4	13	2.9	9	5.9	11	8.3	8	3.2	12
PT	4.9	4	0.1	2	3.8	12	0.7	4	10.1	9	1.0	7
SI	24.3	12	1.5	8	6.3	13	14.2	13	63.3	13	5.9	13
SK	5.5	5	0.3	5	0.3	1	2.7	9	27.3	12	0.2	1
FI	24.4	13	2.3	11	3.6	11	10.2	12	4.3	4	2.9	11
EA	2.3	2	0.3	5	0.5	3	64	3	4.3	5	0.4	3
Average	9.8	8	1.2	8	2.2	8	363	10	14.2	10	1.5	10

Sources: Euromonitor (2011) and Eurosystem staff calculations.
Notes: Groc. denotes grocery; H&B health and beauty; C&F clothing and footwear; H&G house and gardening; E&A electronics and appliances; L&P leisure and personal.

Table A10 Profit margins adjusted for implicit labour income of self-employed [1)]

(percentages)

	Distributive trades G		Wholesale G51		Retail G52		Grocery retail G5211		Non-grocery retail G52X11	
EA	4.7		4.7		5.2		3.6	-	5.9	-
BE	2.8	1	2.9	2	4.1	5	3.5	5	4.6	3
DE	6.0	14	5.1	10	6.1	12	4.1	7	7.1	13
IE	4.2	6	4.2	4	3.9	3	3.5	4	4.8	4
GR	6.3	15	7.5	15	5.8	9	5.3	14	6.0	8
ES	4.6	8	4.7	8	5.9	10	4.9	13	6.4	10
FR	3.2	2	2.8	1	4.5	6	3.6	6	5.3	6
IT	3.7	4	5.1	11	2.4	1	1.2	1	3.2	1
CY	5.4	11	6.6	14	4.7	7	2.4	2	5.5	7
LU	4.4	7	4.3	6	6.0	11	4.8	12	6.6	11
NL	5.1	10	5.0	9	7.4	15	4.7	11	8.3	15
AT	3.8	5	4.0	3	4.1	4	2.9	3	5.0	5
PT	3.6	3	4.3	5	3.5	2	4.4	9	3.8	2
SI	5.7	13	6.0	13	6.6	14	6.5	15	6.8	12
SK	5.4	12	5.4	12	6.4	13	4.1	8	7.5	14
FI	4.7	9	4.6	7	5.5	8	4.7	10	6.0	9
Max.	6.3	GR	7.5	GR	7.4	NL	6.5	SI	8.3	NL
Min.	2.8	BE	2.8	FR	2.4	IT	1.2	IT	3.2	IT
std. dev.	1.1		1.2		1.3		1.3		1.4	

Sources: Eurostat SBS database and Eurosystem staff calculations.
1) As noted in Section 1.1, the high proportion of self-employed in the distributive trades (especially in the grocery sector in some countries) may impact on the comparability of reported profits and profit margins. Therefore, it may be desirable to adjust for the imputed labour income of the self-employed. The data in the table have been adjusted using the same method outlined in Section 1.1.

Table A11 Downstream market share by country and parental group

Country	Parental group	Market share (%)
AT	1st	14.9
	2nd	11.1
	3rd	10.7
	4th	8.4
	5th	8.4
	6th	6.5
	7th	6.5
	8th	5.8
	9th	5.0
	10th	5.0
	11th	4.7
	12th	4.0
	13th	3.9
	14th	1.0
	15th	0.9
	16th	0.9
	17th	0.6
	18th	0.6
	19-21st	1.2
BE	1st	31.7
	2nd	19.3
	3rd	15.0
	4th	9.3
	5th	8.1
	6th	5.6
DE	1st	33.0
	2nd	23.5
	3rd	14.5
	4th	12.2
	5th	1.6
	6th	1.3
	7th	0.8
	8th	0.8
ES	1st	21.6
	2nd	13.9
	3rd	13.3
	4th	5.6
	5th	4.7
	6th	3.7
	7th	3.6
	8th	2.4
	9th	2.1
	10th	1.5
	11th	1.5
	12th	1.4
	13th	1.3
	14th	1.3
	15th	1.3
	16th	1.2
	17th	1.1
	18th	1.0
	19th	1.0
	20th	0.8
ES	21th	0.7
	22th	0.6
	23th	0.6
	24th	0.6
	25th	0.6
	26th-186th	11.2
FI	1st	40.4
	2nd	33.9
	3rd	10.4
	4th	0.8
FR	1st	15.7
	2nd	12.0
	3rd	9.9
	4th	8.6
	5th	8.6
	6th	8.3
	7th	5.1
	8th	4.2
	9th	3.9
	10th	3.3
	11th	3.1
	12th	2.8
	13th	2.7
	14th	2.6
	15th	2.5
	16th	1.1
	17th	1.1
	18th	0.7
	19th	0.6
	20th-47th	3.0
GR	1st	25.8
	2nd	9.6
	3rd	8.8
	4th	8.3
	5th	7.8
	6th	6.7
	7th	5.1
	8th	4.0
	9th	3.8
	10th	2.9
	11th	2.8
	12th	2.2
	13th	2.0
	14th	2.0
	15th	1.4
	16th	0.8
	17th	0.7
	18th	0.7
	19th-27th	1.7
IT	1st	11.1
	2nd	10.2
	3rd	8.4
	4th	7.8
IT	5th	6.7
	6th	5.3
	7th	4.6
	8th	4.1
	9th	3.8
	10th	3.5
	11th	3.3
	12th	3.0
	13th	2.6
	14th	2.5
	15th	2.3
	16th	2.1
	17th	2.0
	18th	1.8
	19th	1.7
	20th	1.7
	21th	1.6
	22th	0.9
	23th	0.6
	24th-30th	1.4
NL	1st	27.1
	2nd	11.2
	3rd	10.1
	4th	8.0
	5th	7.6
	6th	6.8
	7th	4.7
	8th	3.6
	9th	3.6
	10th	2.7
	11th	2.4
	12th	1.9
	13th	1.7
	14th	1.6
	15th	1.5
	16th	1.1
	17th	1.0
	18th	0.9
	19th	0.9
	20th	0.7
	21th-22th	0.9
PT	1st	20.7
	2nd	17.7
	3rd	11.3
	4th	9.3
	5th	8.1
	6th	7.6
	7th	2.1
	8th	1.5
	9th	1.4
	10th	0.9
	11th	0.8
	12th	3.5

Source: ECB calculation from 2010 Nielsen structural data.
Notes: The residual market share for Belgium, Germany, Spain, France, Greece, Italy, Portugal and Finland is represented by independent parental groups.

Table A12 Upstream market share by country and buying group

Country	Buying group	Market share (%)
AT	1st	34.4
	2nd	33.1
	3rd	10.7
	4th	7.0
	5th	5.8
	6th	4.7
	7th	3.9
	8th	0.4
BE	1st	35.6
	2nd	21.7
	3rd	16.9
	4th	10.5
	5th	9.1
	6th	6.3
DE	1st	36.3
	2nd	26.7
	3rd	13.7
	4th	12.8
	5th	9.6
	6th	0.9
	7th	0.1
ES	1st	21.6
	2nd	13.9
	3rd	13.3
	4th	5.6
	5th	4.7
	6th	3.7
	7th	3.6
FI	1st	45.9
	2nd	38.9
FI	3rd	12.8
	4th	2.4
FR	1st	25.5
	2nd	16.1
	3rd	13.8
	4th	13.2
	5th	9.7
	6th	9.5
GR	1st	38.9
	2nd	16.0
	3rd	14.4
	4th	7.7
	5th	5.8
	6th	4.3
	7th	3.3
	8th	3.0
	9th	2.1
	10th	1.2
	11th	1.1
	12th	1.1
	13th	0.7
	14th	0.3
	15th	0.1
IT	1st	21.6
	2nd	18.0
	3rd	11.2
	4th	11.2
	5th	11.0
	6th	8.2
	7th	4.1
IT	8th	3.5
	9th	2.7
	10th	2.4
	11th	2.2
	12th	1.9
	13th	1.7
	14th	0.4
NL	1st	31.8
	2nd	27.1
	3rd	14.8
	4th	8.0
	5th	7.6
	6th	6.8
	7th	2.7
	8th	0.7
	9th	0.5
PT	1st	24.5
	2nd	21.4
	3rd	13.4
	4th	11.0
	5th	9.6
	6th	9.0
	7th	6.0
	8th	2.5
	9th	1.1
	10th	0.9
	11th	0.3
	12th	0.2

Source: ECB calculation from 2010 Nielsen structural data.

Table A13 HHI at the NUTS2 level by buying group, parental group and shop

Country	NUTS2	Buying group	Parental group	Shop
AT	Burgenland	26.52	8.64	6.59
	Kärnten	32.20	10.50	7.44
	Niederösterreich	24.96	8.86	7.14
	Oberösterreich	27.17	9.53	6.07
	Salzburg	29.19	8.86	6.63
	Steiermark	24.95	9.67	6.35
	Tirol	28.77	16.81	13.31
	Vorarlberg	37.51	11.63	7.89
	Wien	30.08	13.01	12.80
BE	Prov. D'anvers	24.89	20.38	6.86
	Prov. de Flandre-Occidentale	22.04	18.11	5.90
	Prov. de Flandre-Orientale	20.55	17.52	6.54
	Prov. de Hainaut	22.79	19.46	7.81
	Prov. de Limbourg	24.12	19.45	6.35
	Prov. de Liège	23.48	19.98	7.13
	Prov. de Luxembourg	21.06	19.32	8.96
	Prov. de Namur	22.52	19.56	7.42
	Prov. du Brabant Flamand	24.97	22.16	9.30
	Prov. du Brabant Wallon	31.99	28.97	12.09
	Région bruxelloise	24.41	21.48	9.32
DE	Baden-Württemberg	25.86	24.68	5.23
	Bayern	28.66	23.82	4.35
	Berlin	21.94	18.03	8.66
	Brandenburg	24.83	20.79	9.27
	Bremen	26.42	24.73	9.12
	Hamburg	27.91	24.92	8.75
	Hessen	27.27	25.37	5.41
	Mecklenburg-Vorpommern	24.56	18.40	7.79
	Niedersachsen	24.95	23.68	5.43
	Nordrhein-Westfalen	23.67	20.61	4.18
	Rheinland-Pfalz	23.09	20.80	5.39
	Saarland	22.26	21.86	8.86
	Sachsen	27.22	25.85	9.29
	Sachsen-anhalt	32.06	28.07	7.98
	Schleswig-holstein	22.82	18.45	7.44
	Thüringen	26.31	23.98	4.49
ES	Andalucía	23.04	11.84	7.69
	Aragón	19.66	13.72	10.13
	Asturias	24.47	15.18	8.94
	Baleares	29.63	20.86	17.15
	Cantabria	29.81	15.99	11.77
	Castilla la Mancha	23.66	10.15	7.80
	Castilla y León	22.14	10.98	7.14
	Cataluña	20.62	10.23	5.95
	Comunidad Valenciana	24.56	13.80	12.13
	Extremadura	31.59	17.83	10.53
	Galicia	21.23	14.64	8.98
	Madrid	23.90	13.04	7.57
	Murcia	22.42	12.80	10.42
	Navarra	26.30	22.28	11.27
	País Vasco	29.76	27.64	21.40
	Rioja	27.01	21.54	14.34
FI	Ahvenanmaa	74.78	61.31	11.93
	Itä-Suomi	41.95	35.40	0.76
	Länsi-Suomi	38.02	29.49	0.68
	Muu Etelä-Suomi	37.11	32.53	0.57
	Pohjois-Suomi	37.12	29.09	0.77
	Uusimaat	37.57	31.88	0.54

Source: ECB calculation from 2010 Nielsen structural data.

Table A13 HHI at the NUTS2 level by buying group, parental group and shop (cont'd)

Country	NUTS2	Buying group	Parental group	Shop
FR	Alsace	15.51	8.90	7.90
	Aquitaine	16.88	11.50	8.89
	Auvergne	16.71	8.47	6.27
	Bourgogne	15.56	9.50	6.98
	Bretagne	18.08	12.58	9.14
	Centre	15.82	11.06	8.04
	Champagne-Ardennes	17.11	10.66	9.08
	Corse	33.68	14.36	13.58
	Franche-Comté	13.04	8.33	6.09
	Ile-de-France	21.33	10.68	8.48
	Languedoc-Roussillon	17.59	10.14	6.78
	Limousin	17.78	10.05	6.94
	Lorraine	13.40	9.17	8.22
	Midi-Pyrénées	16.72	10.41	7.48
	Nord-Pas-de-Calais	19.06	9.30	8.10
	Normandie (Basse-)	21.11	10.38	8.42
	Normandie (Haute-)	19.42	10.72	9.00
	Pays-de-la-Loire	19.95	14.57	11.38
	Picardie	16.27	10.70	8.83
	Poitou-Charentes	16.97	12.05	9.54
	Provence-Côte-Azur	19.10	8.57	7.01
	Rhône-Alpes	19.22	8.47	6.67
GR	Anatoliki Makedonia, Thraki	34.54	21.23	17.10
	Attiki	22.84	14.30	9.09
	Dytiki ellada	21.94	12.51	9.73
	Dytiki Makedonia	21.83	13.30	10.71
	Ionia Nisia	55.41	26.46	26.46
	Ipeiros	18.27	9.64	7.94
	Kentriki Makedonia	24.00	15.46	14.17
	Kriti	31.29	17.82	15.73
	Notio Aigaio	88.83	42.09	42.09
	Peloponnisos	22.57	13.02	7.12
	Sterea Ellada	26.54	15.71	13.28
	Thessalia	23.93	13.16	11.74
	Voreio Aigaio	50.00	28.60	28.60
IT	Abruzzo	17.03	9.85	0.52
	Basilicata	21.18	14.21	0.73
	Calabria	13.34	7.81	0.23
	Campania	18.33	9.54	0.15
	Emilia-Romagna	24.84	14.86	0.21
	Friuli-Venezia Giulia	22.29	11.95	0.39
	Lazio	14.20	8.25	0.12
	Liguria	19.13	11.78	0.38
	Lombardia	10.97	6.29	0.12
	Marche	17.76	12.49	0.35
	Molise	16.86	11.32	1.98
	Piemonte	12.33	8.79	0.19
	Puglia	15.06	8.65	0.16
	Sardegna	17.00	11.17	0.18
	Sicilia	16.20	7.35	0.11
	Toscana	23.27	15.72	0.28
	Trentino-Alto Adige	30.70	16.65	0.27
	Umbria	19.24	13.73	0.41
	Valle D'aosta	19.16	15.94	11.07
	Veneto	14.18	9.56	0.12

Source: ECB calculation from 2010 Nielsen structural data.

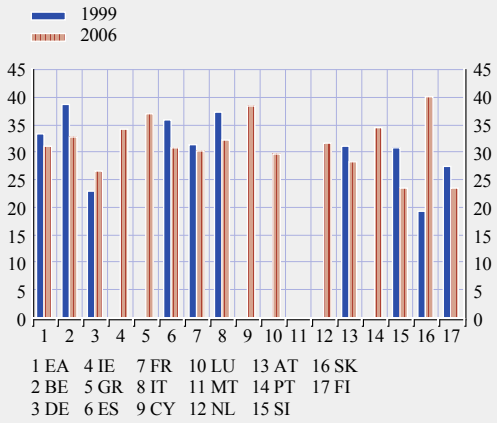
Table A13 HHI at the NUTS2 level by buying group, parental group and shop (cont'd)

Country	NUTS2	Buying group	Parental group	Shop
NL	Drenthe	18.31	11.79	6.08
	Flevoland	18.65	18.90	8.52
	Friesland (NL)	20.93	12.24	8.77
	Gelderland	21.04	12.41	6.16
	Groningen	18.45	15.33	8.54
	Limburg (NL)	22.27	14.12	8.99
	Noord-Brabant	21.30	14.07	8.41
	Noord-Holland	30.34	15.26	10.48
	Overijssel	22.36	11.96	7.01
	Utrecht	23.01	14.38	8.44
	Zeeland	27.01	14.51	6.67
	Zuid-Holland	22.39	16.88	10.12
PT	Alentejo	17.13	14.50	9.38
	Algarve	16.81	13.95	8.36
	Centro	15.59	13.36	7.63
	Lisboa	16.22	13.49	9.70
	Norte	17.11	14.73	7.70

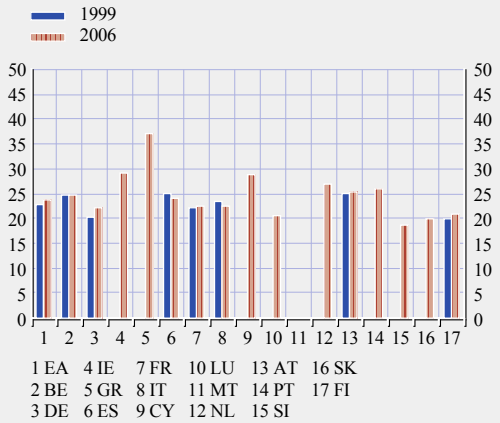
Source: ECB calculation from 2010 Nielsen structural data.

Chart A1 Share of the distributive trades sector in the non-financial business sector – additional dimensions

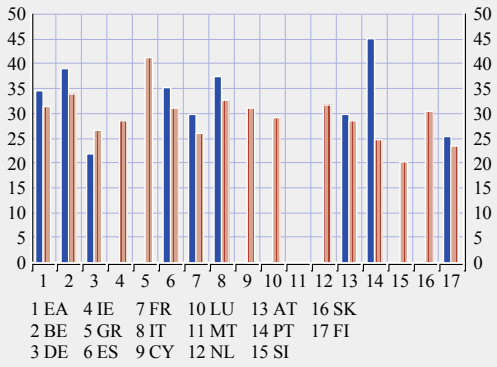
a) Number of firms



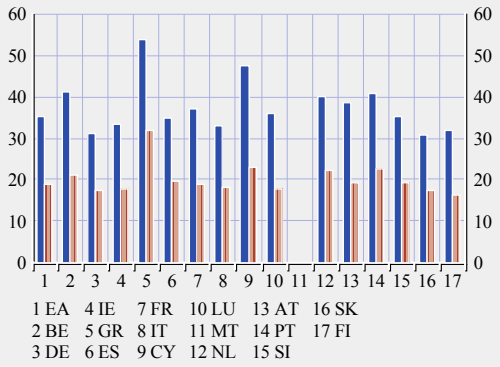
b) Employment



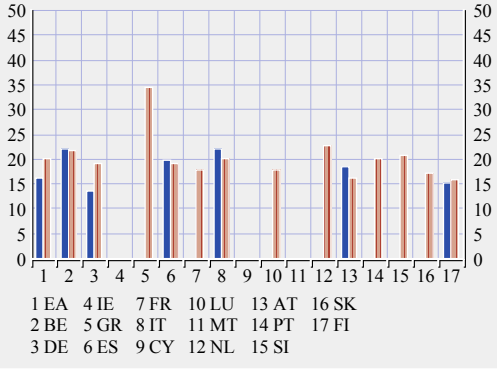
c) Self-employment



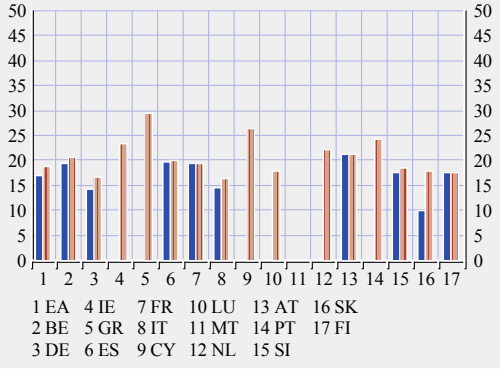
d) Turnover and value added (2006)



e) Profits (unadjusted)



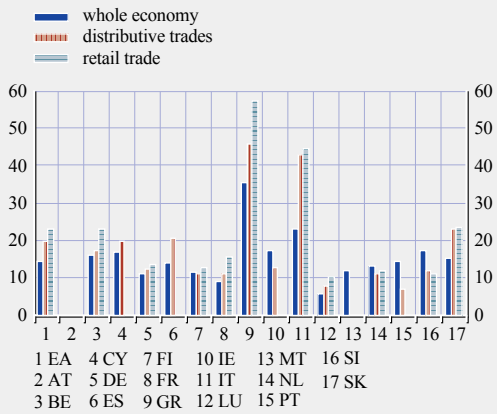
f) Labour costs (unadjusted)



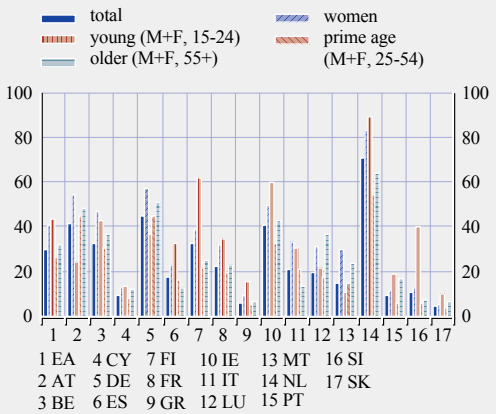
Sources: Eurostat SBS database and Eurosystem staff calculations.
Notes: SBS data not available for Malta for the years shown in the chart. SBS data for Ireland, Greece, Cyprus, Luxembourg, Malta, the Netherlands, Slovenia and Slovakia not available for 1999. For Portugal, data are not shown for 1999, owing to a structural break in the database.

Chart A2 Cross-country differences in employment characteristics in the distributive trades (2009)

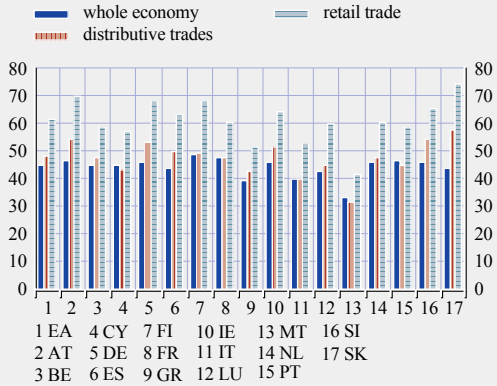
a) Self-employment



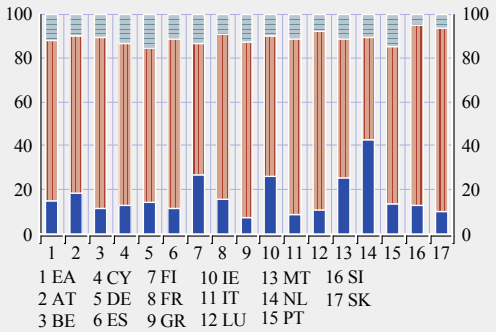
b) Part-time work as a percentage of the total



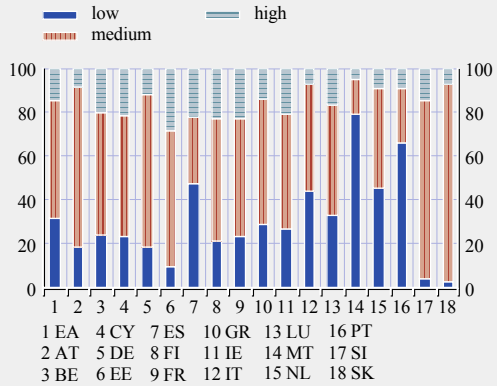
c) Women as a percentage of total employment



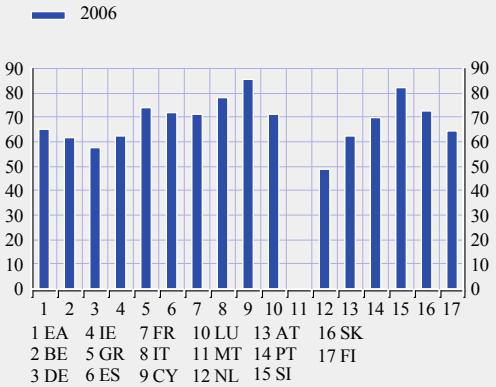
d) Employment shares by age



e) Highest skill attained [1)]



f) Low pay

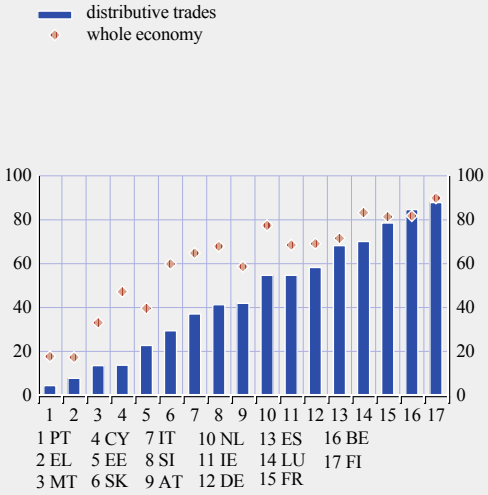


Sources: Chart (a): Eurostat (national accounts data) and Eurosystem staff calculations. Charts (b) to (f): Eurostat (European Labour Force Survey) and Eurosystem staff calculations. Charts (g) and (h): Eurofound (2009).
1) Chart (e): Low-skilled refers to those with, at best, only basic school leaving certificates; medium-skilled refers to those with secondary school leaving certificates typically obtained at age 18/19 or equivalent vocational qualifications; high-skilled refers to those with tertiary (university-level or supervisory) qualifications.
2) Charts (g)-(h): Eurofound estimates on the basis of the European Company Survey 2009, an establishment survey of some 27,000 establishments employing 10+ employees. Estimates of trade union membership on the basis of total union membership in participating firms, weighted by employees. Estimates of collective agreement coverage are based on employer responses.

Chart A2 Cross-country differences in employment characteristics in the distributive trades (2009) (cont'd)

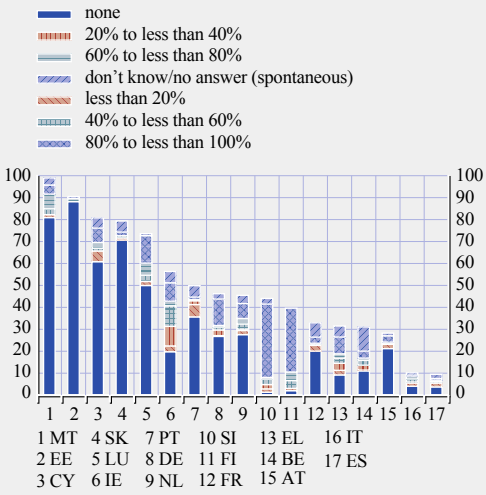
(estimated percentages [2])

g) Trade union membership in the retail trade, compared with the economy as a whole



(estimated percentages [2])

h) Coverage of collective wage agreements in retail establishments across Europe



Sources: Chart (a): Eurostat (national accounts data) and Eurosystem staff calculations. Charts (b) to (f): Eurostat (European Labour Force Survey) and Eurosystem staff calculations. Charts (g) and (h): Eurofound (2009).
1) Chart (e): Low-skilled refers to those with, at best, only basic school leaving certificates; medium-skilled refers to those with secondary school leaving certificates typically obtained at age 18/19 or equivalent vocational qualifications; high-skilled refers to those with tertiary (university-level or supervisory) qualifications.
2) Charts (g)-(h): Eurofound estimates on the basis of the European Company Survey 2009, an establishment survey of some 27,000 establishments employing 10+ employees. Estimates of trade union membership on the basis of total union membership in participating firms, weighted by employees. Estimates of collective agreement coverage are based on employer responses.
Notes: Chart (g): The figures indicate the percentage of employees working in establishments with employee representation at establishment level or above. Figures weighted by employment; Chart (h): Survey question asked "What proportion of your employees is covered by a collective wage agreement, be it on the level of the establishment or any higher level?" Figures weighted by employees.

Table A14 Price levels across the euro area in 2009 for different product categories

(euro area = 100; cc denotes country)

	BE	DE	IE	GR	ES	FR	IT	CY
GDP	108.2	100.6	112.8	88.8	88.9	109.7	97.3	86.1
0 Overall consumption	110.5	98.6	*122.9*	90.6	91.5	107.2	100.0	87.3
Rank	**13**	**8**	**16**	**6**	**7**	**12**	**9**	**5**
1 Food/non-alcoholic drinks	108.4	104.1	*120.6*	94.2	90.6	103.6	101.3	100.9
1.1 Food	107.9	104.5	*118.9*	92.9	90.1	104.6	102.1	98.6
1.1.1 Bread/cereals	106.4	101.3	*120.5*	107.3	101.7	103.2	94.7	106.2
1.1.2 Meat	109.8	114.7	109.7	86.1	77.7	110.6	101.7	81.9
1.1.3 Fish	*122.9*	104.3	108.5	106.7	89.4	105.6	111.2	115.0
1.1.4 Dairy/eggs	114.7	**86.3**	128.6	125.0	98.8	97.4	117.0	*129.3*
1.1.5 Oils/fats	*119.2*	93.5	100.6	114.8	**79.6**	101.8	111.2	105.5
1.1.6 Fruit/vegetables	105.0	121.4	*137.0*	73.4	96.3	112.9	90.7	88.5
1.1.7 Other food	98.5	99.8	116.2	109.3	96.2	96.9	*123.1*	114.1
1.2 Non-alcoholic drinks	114.1	104.4	*140.6*	113.2	95.7	95.1	92.3	127.5
2 Alcoholic drinks/tobacco	102.2	101.7	*184.4*	83.7	**77.2**	109.5	106.6	99.3
2.1 Alcoholic drinks	102.8	92.1	169.9	106.6	**85.8**	96.7	114.4	120.4
2.2 Tobacco	105.1	116.1	*212.1*	69.9	71.2	129.9	101.2	86.1
3 Clothing/Footwear	110.2	100.3	99.8	101.9	90.9	102.0	100.9	91.7
3.1 Clothing	111.3	100.8	102.1	103.0	**88.6**	104.3	99.0	92.4
3.2 Footwear	107.0	98.6	86.4	102.0	97.6	92.7	109.6	89.2
5 Household goods	103.4	95.0	108.4	100.6	101.3	105.1	102.1	98.1
5.1 Household furnishings	101.3	94.9	105.0	107.7	104.2	102.3	105.1	98.4
5.3 Household appliances	100.4	91.8	97.6	96.3	108.9	109.0	105.6	116.7
9 Recreation/Culture	101.2	98.8	111.7	95.8	94.0	106.1	100.9	89.2
9.1 Electronic equipment	104.2	94.4	104.5	96.6	100.8	105.8	103.2	*106.2*
12 Misc. goods/services	111.3	98.6	*124.7*	86.5	86.6	107.6	101.2	84.4

Sources: Eurostat's PPP database and Eurosystem staff calculations.
Notes: The highest price levels for each product category are shown in italics, while the lowest are shown in bold.

LU	MT	NL	AT	PT	SI	SK	FI
112.6	70.0	106.0	105.6	79.0	78.6	**63.6**	*113.6*
122.7	70.7	103.4	105.0	81.7	78.6	**62.4**	116.8
15	2	10	11	4	3	1	14
109.7	87.9	91.6	109.3	86.7	90.1	**76.2**	111.9
110.9	85.4	91.4	110.0	85.7	90.3	**74.4**	110.4
113.5	77.3	90.7	115.3	97.5	92.4	**71.5**	115.9
106.1	68.4	104.4	*116.3*	72.6	83.5	**61.7**	109.0
116.7	91.3	101.6	110.8	77.4	96.9	79.9	98.7
112.7	105.7	87.3	94.5	105.1	95.3	86.5	104.6
117.8	105.9	79.8	112.9	94.2	116.8	104.0	107.4
120.4	87.2	100.2	117.2	**77.4**	88.3	**70.3**	123.4
103.0	111.0	**75.6**	108.9	109.2	97.5	101.4	108.2
104.2	116.1	94.9	106.0	100.6	**91.1**	98.8	128.7
90.0	93.9	103.7	94.6	83.7	78.2	81.6	136.0
95.3	100.2	100.7	96.9	87.4	103.3	98.2	*172.8*
85.4	91.6	107.9	94.3	83.0	**63.4**	71.5	107.2
104.2	88.1	101.8	99.8	94.6	96.2	95.9	*118.7*
103.2	89.3	100.7	100.1	99.6	99.8	101.1	*117.8*
104.1	87.9	103.9	96.0	**84.8**	85.6	90.4	*114.6*
111.4	104.3	96.1	105.8	92.1	91.7	**85.6**	107.2
108.9	*116.3*	97.6	102.0	99.0	92.6	**88.6**	106.3
95.9	*123.4*	**89.3**	91.7	92.5	102.4	94.3	106.0
96.2	72.2	99.3	103.5	86.8	86.2	**65.6**	*115.8*
92.4	102.7	97.7	97.8	101.7	102.0	95.8	105.6
112.4	66.6	100.9	106.7	81.1	79.3	**61.0**	118.4

Table A15 Mapping of HICP, PPI and import prices (measured by UVI)

HICP (COICOP)	PPI (NACE Rev. 2)	Import prices (UVI) (CPA2002)
Textile (030000)	Textile (NS0012)	Textile (17)
Cars (071100)	Manufacture of motor vehicles (2C2910) – for BE, IE, LU, NL, T, FI (2C2900)	Motor vehicles (341)
Furniture (051100)	Manufacture of furniture (2C3100)	Furniture (361)
Sound and picture equipment (091100)	Manufacture of consumer electronics (2C2640)	TV and radio receivers (323)
Information processing equipment (091300)	Manufacture of computers and peripheral equipment (2C2620)	Office machinery and computers (300)
Photographic and cinematographic equipment and optical instruments (091200)	Manufacture of optical instruments and photographic equipment (2C2670)	Optical instruments and photographic equipment (334)
Personal care appliances (1212_3)	Manufacture of perfumes and toilet preparations (2C2042)	Soap, detergents, perfumes (245)
Household appliances (0531_2)	Manufacture of domestic appliances (2C2750)	Domestic appliances n.e.s. (297)
Jewellery, clocks and watches (123100)	Manufacture of jewellery, bijouterie and related articles (2C3210)	Jewellery and related articles (362), watches and clocks (335)
Non-durable HH goods (.056100)	Manufacture of soap, detergents, etc. (2C2040)	Soap, detergents, perfumes (245)
Pharmaceuticals (061100)	Manufacture of basic pharmaceutical products and pharmaceutical preparations (2C2100)	Pharmaceuticals (244)
Games, toys and hobbies (093100)	Manufacture of games and toys (2C3240)	Games and toys (365)
Equipment for sport, camping and open-air recreation (093200)	Manufacture of sports goods (2C3230)	Sport goods (364)
Newspapers, books and stationery (095000)	Printing and service activities related to printing (2C1810)	Printing and services activity related to printing (222)
Spare parts for personal transport equipment (072100)	Manufacture of parts and accessories for motor vehicles (2C2930)	Parts and accessories for motor vehicles (343)

Table A16 Estimated pass-through of producer prices and import prices to consumer prices in ARDL model

Estimated pass-through of PPI and UVI to consumer prices (ARDL)

	BE		DE		FR		IE		IT		ES	
	PPI	UVI	PPI	UVI	PPI	UVI	PPI	UVI	PPI	UVI	PPI	UVI
Clothing and footwear			0.61	0.11			0.60		0.55			
Motor cars		0.13	0.87		0.32		N/A		0.20	0.11	0.90	
Furniture and furnishings	0.15		0.53		0.48		N/A		0.49		0.65	
Equipment for reception, recording and reproduction of sound and pictures			0.94		N/A	N/A	N/A	0.43		0.34	0.50	0.33
Information processing equipment	N/A				N/A		N/A				0.77	
Photographic and cinematographic equipment and optical instruments	N/A						N/A	0.78			N/A	N/A
Appliances for personal care		0.10	0.56	0.19	0.68	0.11	N/A		0.06		0.32	
Household appliances							N/A	0.20	0.04			
Jewellery, clocks and watches			0.39	0.03	1.00		N/A		1.04		1.10	
Non-durable household goods			0.27		0.16	0.12	N/A					
Pharmaceutical products			0.35				N/A					
Games, toys and hobbies	N/A	0.20		0.03		0.19	N/A	0.10				
Equipment for sports, camping and open-air recreation				0.01	0.10	0.17	N/A				N/A	N/A
Newspapers, books and stationery			0.47	0.05			0.39	0.02				
Spare parts and accessories for personal transport equipment				0.18	N/A	N/A	N/A	0.05	0.97			
Median	0.15	0.13	0.53	0.05	0.40	0.15	0.49	0.20	0.35	0.23	0.71	0.33

Notes: The pass-through estimates are long-run elasticities according to section 2.3.2.A. Blank entries are due to the statistical insignificance of estimates; N/A: not available due to time series being missing or too short.

Table A16 Estimated pass-through of producer prices and import prices to consumer prices in ARDL model (cont'd)

Estimated pass-through of PPI and UVI to consumer prices (ARDL)

	NL		AT		PT		FI		Median	
	PPI	UVI	PPI	UVI	PPI	UVI	PPI	UVI	PPI	UVI
Clothing and footwear							0.23		0.57	0.11
Motor cars		0.01		0.12		0.40			0.59	0.12
Furniture and furnishings					0.63			0.17	0.51	0.17
Equipment for reception, recording and reprod. of sound & pictures	N/A	0.49	N/A	0.81			N/A		0.72	0.43
Information processing equipment			N/A		N/A	0.27	N/A	0.26	0.77	0.26
Photographic and cinematographic equipment and optical instruments	N/A		N/A		N/A		N/A	0.41		0.59
Appliances for personal care			N/A				N/A		0.44	0.11
Household appliances			N/A	0.12			N/A		0.04	0.16
Jewellery, clocks and watches	N/A	0.13	N/A				N/A		1.02	0.08
Non-durable household goods	N/A	0.30	N/A				N/A	0.08	0.21	0.12
Pharmaceutical products					0.63		N/A		0.49	
Games, toys and hobbies	N/A		N/A				N/A			0.14
Equipment for sports, camping and open-air recreation	N/A	0.20	N/A		N/A	0.08			0.10	0.13
Newspapers, books and stationery							N/A		0.39	0.05
Spare parts and accessories for personal transport equipment	N/A		N/A				N/A		0.97	0.12
Median		0.20		0.12	0.63	0.27	0.23	0.21	0.50	0.17

Notes: The pass-through estimates are long-run elasticities according to section 2.3.2.A. Blank entries are due to the statistical insignificance of estimates; N/A: not available due to time series being missing or too short.

Table A17 Estimated long-run elasticity of consumer prices to import price changes

	BE	DE	GR	FR	IE	IT	ES	LU	NL	AT	PT	FI	Median	Euro area
Clothing and footwear			1.09	0.24	2.67	0.55				0.28	0.25		0.42	0.39
Motor cars	0.56	0.77		0.31	0.24	0.58	0.36	0.43	0.39	0.39	0.76		0.41	0.44
Furniture and furnishings	0.68	0.43	0.57	0.45	0.82	0.90	1.28	0.53	0.62	0.32	0.17	0.17	0.55	0.79
Equipment for reception, recording and reproduction of sound and pictures[1]		0.28	0.18	0.49		0.24	0.57	0.05	0.76	0.54	0.30		0.30	0.47
Information processing equipment[1]	1.63		0.20				1.75		0.51		0.60	0.56	0.58	
Photographic and cinematographic equipment and optical instruments[1]		0.31		0.16		0.25	0.75	0.47	0.60			1.08	0.47	0.64
Appliances for personal care	0.87	0.22	0.91	0.77	0.14	0.45	0.75	0.52		0.64	0.51	0.25	0.52	0.59
Household appliances[1]		0.10	0.31					0.04		0.22	0.10		0.10	0.04
Jewellery, clocks and watches	0.78	0.31	0.32	0.73	0.19	1.06	0.32	0.54	0.23	0.65	1.21	0.45	0.49	0.81
Non-durable household goods	1.22		0.84	0.66	0.11	0.50	0.57	0.43		0.26		0.15	0.50	0.50
Pharmaceutical products		0.90	0.17	0.28	0.64	0.36						0.32	0.34	0.49
Games, toys and hobbies	0.13									0.18			0.15	
Equipment for sports, camping and open-air recreation			0.42	0.04	0.10	0.05	0.02						0.05	
Newspapers, books and stationery	0.40	0.23	0.98	0.52		0.46	0.93	0.21	0.76	0.66		0.18	0.49	0.94
Spare parts and accessories for personal transport equipment	0.34	0.40	0.37	0.71		0.50	0.35		0.55	0.53		1.11	0.50	0.73
Median	0.68	0.31	0.39	0.47	0.21	0.48	0.57	0.43	0.57	0.39	0.41	0.32	0.45	0.54

Note: The estimation is based on iterated SUR regression using a balanced sample (Q1 1999-Q2 2010).
1) Estimation includes a time trend.

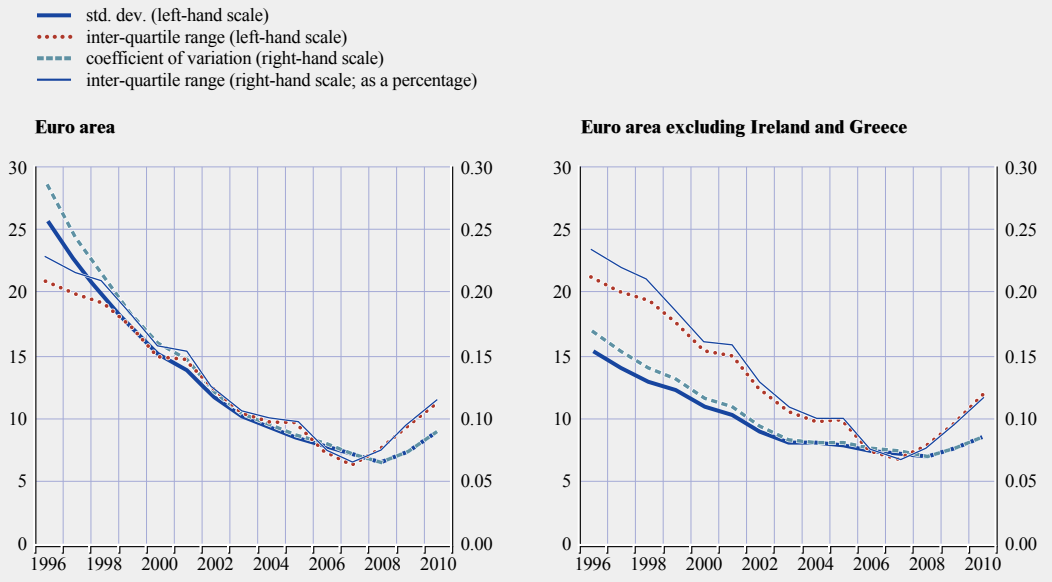
Table A18 Main source countries of euro area imports of textiles and clothing

(percentages and percentage point change)

	2000-2004	2005-2009	p.p. change
Intra-euro area	39.9	47.0	7.1
China	10.7	20.1	9.4
Turkey	5.7	5.7	-0.1
India	2.5	3.5	1.0
United Kingdom	2.9	2.9	-0.1
Bangladesh	2.6	3.1	0.5
Romania	4.8	3.3	-1.5
Tunisia	3.7	2.8	-0.9
Morocco	2.8	2.4	-0.4
Poland	2.0	1.2	-0.9
Sum	77.7	92.0	14.3

Sources: Eurostat and ECB staff.
Note: The intra-euro area concept changes with time, meaning that part of the increase in intra-euro area imports is due to the accession of Cyprus, Malta, Slovenia and Slovakia to the euro area.

Chart A3 Dispersion of euro area clothing and footwear prices



Sources: Eurostat and Eurosystem staff calculations.

2 ADDITIONAL TECHNICAL AND BACKGROUND MATERIAL

Table A19 Overview of main datasets used in report

Source	Name	Dimensions	Comments
Eurostat	National accounts	Information on the main macroeconomic variables, such as output, value added, employment, etc.	Publicly available. In theory, these are the most internally consistent and harmonised across countries, but there is less detail on sectors and variables for distributive trades than in the SBS dataset
Eurostat	SBS	Information on key macroeconomic variables, such as output, value added, employment, etc.	Publicly available. Although there is more detail on sectors and variables for the distributive trades sectors, there may be breaks across countries and time
Eurostat	PPP	Data on relative price levels for 48 product groups	Publicly available
Eurostat	PPP basic heading level	Data on relative price levels for 148 product categories	Available upon request for research purposes
Eurostat	PPP product level quaranta tables	Data on actual average prices and price dispersion for approximately 3,000 products	Access restricted
Nielsen	Store database	Approximately 130,000 store locations with information on store type and size, etc.	Private database. For a more detailed overview, see Annex 2
Euromonitor	Industry passport	Detailed market information, including market shares by company, brand, etc.	Private database. Retail and selected consumer goods industries
National statistical institutes (NSIs)	Regional CPIs	Six countries, 84 regions, 12 coicop groups, 1995-2010	Availability depends on the individual country's national statistical institute
European Commission DG AGRI	Agricultural prices	Data on agricultural prices covering meats, dairy products, oils and grains	Publicly available. See Section 2.4.2 (ec.europa.eu/agriculture/markets/prices/monthly_en.xls)
National central banks (NCBs)	Qualitative survey	Qualitative information on the main features and trends in individual countries	Provided by NCB task force members
NCBs	IPN and WDN data	Quantitative and survey information of price-setting behaviour	Restricted access. IPN and WDN
OECD	PMR	Indicators of the degree of product market regulation – barriers to entry, price controls and operating restrictions	Aggregated data publicly available. Updates to 2010 based on information received from NCBs

Table A20 Statistical classification of distributive trades sectors[1)]

Section	G – Wholesale and retail trade; repair of motor vehicles and motorcycles		
Division	45 – *Trade and repair of motor vehicles and motorcycles*	46 – *Wholesale trade* (except in motor vehicles and motorcycles)	47 – *Retail trade* (except in motor vehicles and motorcycles)
Group	45.1 – Sale of motor vehicles 45.2 – Maintenance and repair of motor vehicles 45.3 – Sale of motor vehicle parts and accessories 45.4 – Sale, maintenance and repair of motorcycles and related parts and accessories	46.1 – Wholesale on a fee or contract basis 46.2 – Wholesale of agricultural raw materials and live animals 46.3 – Wholesale of food, beverages and tobacco 46.4 – Wholesale of household goods 46.5 – Wholesale of information and communication equipment 46.6 – Wholesale of other machinery, equipment and supplies 46.7 – Other specialised wholesale 46.9 – Non-specialised wholesale trade	47.1 – Retail sale in non-specialised stores 47.2 – Retail sale of food, beverages and tobacco in specialised stores 47.3 – Retail sale of automotive fuel in specialised stores 47.4 – Retail sale of information and communication equipment in specialised stores 47.5 – Retail sale of other household equipment in specialised stores 47.6 – Retail sale of cultural and recreational goods in specialised stores 47.7 – Retail sale of other goods in specialised stores 47.8 – Retail sale via stalls andmarkets 47.9 – Retail trade not in stores, stalls or markets
Class	Six classes	48 classes – including, for example: 46.31 Wholesale of fruit and vegetables; 46.39 Non-specialised wholesale of food, beverages and tobacco; 46.43 Wholesale of electrical household appliances; 46.74 Wholesale of hardware, plumbing and heating equipment and supplies, etc.	37 classes – including, for example: 47.11 Retail sale in non-specialised stores with food, beverages or tobacco predominating (grocery); 47.3 Retail sale of automotive fuel in specialised stores (petrol stations); 47.71 Retail sale of clothing in specialised stores, etc.

Source: Eurostat (2008) NACE Rev. 2 – statistical classification of economic activities in the European Community.
1) In 2002 a major revision of NACE was launched. The Regulation establishing NACE Rev. 2 was adopted in December 2006. NACE Rev. 2 should, in general, be used for statistics referring to economic activities performed from 1 January 2008 onwards. Although they are broadly similar, there are some differences between NACE Rev. 1.1 and Rev. 2. One substantial difference between the two classifications is the retail sale of automotive fuel, which was classified under motor trade in Rev. 1.1, but under retail trade in Rev. 2. Other differences relate to certain food and alcohol processing activities (under wholesale activities under Rev. 1.1, but under manufacturing in Rev. 2) and consumer goods repair activities (classified under retail trade in Rev. 1.1, but under services in Rev. 2). Lastly, under the NACE Rev. 2 classification, the motor, wholesale and retail trade sectors are denoted as G45, G46 and G47 respectively, whereas under the former NACE Rev. 1.1 they were denoted as G50, G51 and G52. For reasons of data availability, the latter (Rev. 1.1.) classification is most frequently used in this report.

MATHEMATICAL APPENDIX TO BOX 3: FIRM DEMOGRAPHICS, FIRM SIZE AND PERFORMANCE ANALYSIS

The following terminology will be adopted:

- T indicates the turnover produced by a firm, deflated using gross production prices;
- E indicates total employment (number of persons employed);
- N indicates the number of enterprises.

Each variable refers to a specific year, indicated by the pedix t=*1999, 2000,* etc. If the variable is considered for two employment sub-classes (1-19 and 20+), then the pedix i=1,2 is introduced. Thus:

- $\frac{T_{t,i}}{E_{t,i}}$ indicates a productivity index computed for the employment class i in year t;
- $\frac{E_{t,i}}{N_{t,i}}$ indicates the number of persons per firm employed in class i and year t;
- $\frac{N_{t,i}}{N_t}$ indicates the share of firms in class i and year t.

– Finally, the $g_t(\cdot)$ operator applied to the X_t variable indicates the ratio X_t/X_{t-1}.

The objective of the shift and share decomposition is to decompose the growth rate of T:

a) Labour productivity growth *(productivity effect)*;

b) Average firm size variation *(size effect)*;

c) The change in the distribution of the number of firms in the employment classes *(distribution effect)*;

d) The change in the total number of firms *(sector effect)*.

For every employment class i=1,…,I

$$g_t(T_i) = \frac{T_{t,i}}{T_{t-1,i}} = = \frac{\frac{T_{t,i}}{E_{t,i}}\frac{E_{t,i}}{N_{t,i}}\frac{N_{t,i}}{N_t}N_t}{\frac{T_{t-1,i}}{E_{t-1,i}}\frac{E_{t-1,i}}{N_{t-1,i}}\frac{N_{t-1,i}}{N_{t-1}}N_{t-1}} =$$

$$g_t\left(\frac{T_i}{E_i}\right)g_t\left(\frac{E_i}{N_i}\right)g_t\left(\frac{N_i}{N}\right)g_t\left(N\right)$$

The growth rate for *T* in class *i* is the product of the growth rates of the four determinants a)-d) discussed above. The same decomposition is applicable to the whole population. In this case, the instantaneous growth rate (r_t) of the *T* variable for the entire population is equal to the mean of the instantaneous growth rates, weighted by $q_{t-1,i}$, which are the shares of turnover *T* of each class at *t-1*. Using the Taylor first order approximation, the following is obtained:

$$r_t(T) = \underbrace{\sum_i r_t\left(\frac{T_i}{E_i}\right)q_{t-1,i}}_{\textit{productivity effect}} + \underbrace{\sum_i r_t\left(\frac{E_i}{N_i}\right)q_{t-1,i}}_{\textit{size effect}} +$$

$$\underbrace{\sum_i r_t\left(\frac{N_i}{N}\right)q_{t-1,i}}_{\textit{distribution effect}} + \underbrace{r_t\left(\frac{N_i}{N}\right)}_{\textit{sector effect}} + \varepsilon(2)$$

where $\varepsilon(2)$ represents a second-order effect, reflecting the interaction among the four variables.

ANNEX: INDICATOR OF THE DEGREE TO WHICH OPENING TIMES ARE REGULATED

The replies to the OECD's 2007 questionnaire to construct regulation indicators provide very rich information on opening times. Yet this information has not been sufficiently exploited,[141] most likely because not all countries provide such information. It has been provided and updated by the task force members from the participating Eurosystem NCBs. The information in Table A21 is used to construct an indicator of regulations concerning the degree of restrictiveness of opening times in the euro area countries.[142]

Given the substantial heterogeneity regarding exceptions applied by countries to specific establishments, the indicator solely considers the general regulations governing opening times. In the case of countries with regional or local regulations, exceptions for smaller retailers or for different months of the year, the country's most representative regulations have been taken.

As a step prior to constructing the indicator, six variables have been defined which attempt to capture the time during which establishments are not allowed to open. Thus, the first variable (opening time) consists of the time from which establishments may open. As there may be differences between the different days of the week, this variable is calculated as the weekly average of the opening time,[143] meaning that

141 The OECD indicators only take into account whether opening hours are regulated or not; accordingly, it is not possible to qualify the degree of regulation borne by each country in this respect. See, for example, Wölfl et al. (2009).

142 With the exception of Slovenia, owing to a lack of information.

143 That is to say, the regulations governing each of the seven days of the week, including Sundays (even though opening is not a possibility every Sunday), are averaged out. If there are no regulations, the value 0 is assigned to the opening time, whereas, if opening is not possible on Sundays, the opening time is 24. If there are no specific regulations for Sundays, but there are for the other days of the week, then these regulations are applied to Sundays. If the regulations for Mondays and Fridays differ from those for Saturdays, the same regulations are considered to govern Sundays as they do Saturdays. Moreover, it is taken into account for Cyprus that five months of the year have a winter timetable and seven months a summer timetable.

Table A21 Regulation of shop opening hours in the euro area [1)]

	AT	BE	FI	FR	DE	GR
Does regulation exist?	Yes	Yes	Yes	Yes	Yes	Yes
Type of regulation	National	National	National	National	Nat./Reg.	National
Maximum number of opening hours per day	15	16	14			16
Maximum number of opening hours per week	72	91				
Opening time						
Ordinary weekdays	6	5	7			5
Saturdays	6	5	7			5
Sundays and holidays		5	12		13	5
Special weekdays		5				
Closing time						
Ordinary weekdays	21	20	21			21
Saturdays	18	20	18		20	20
Sundays and holidays		20	18		18	20
Special weekdays		21 (Friday)				
Minimum number of closing days per year		52 [3)]				4
Maximum number of Sundays and holidays per year	0	15		5	4	2
Exemptions to general regulation	Yes	Yes	Yes	Yes	Yes	Yes

Sources: Eurosystem staff calculations based on information from the OECD and NCBs.
1) If there is no specific regulation, the related space is left blank.
2) Summer opening hour regulation. In winter, maximum hours are 14.5 hours daily and 82 hours weekly, while the closing time is 7.30 p.m. on weekdays and 7 p.m. on Sundays.
3) One day per week.

the greater the weekly average for the opening time, the more restrictive the regulations. The second variable (closing time) is similar to the first, but takes into account the time from which establishments are not allowed to be open. Specifically, the weekly average of the closing time is calculated: the variable reflected in the indicator is defined as 24 less the weekly average for the closing time in order to ensure that an increase in the variable entails a greater degree of regulation.[144]

The third variable (daily hours open) is defined as 24 less the maximum number of hours that establishments can open *daily*, while the fourth variable (weekly hours open) is calculated as 168 (the number of hours in a week) less the maximum number of hours establishments can open *weekly*. In countries where one or both of these two variables are not explicitly regulated, de facto regulation has been taken into account, based on the restrictions on opening and/or closing times.[145]

Furthermore, the fifth and sixth variables are defined respectively as the minimum number of days establishments must close per year (closing days) and the minimum number of Sundays and bank holidays (closing holidays) that they cannot open.[146] This latter variable is defined as 52, the average number of Sundays in a year, less the maximum number of Sundays and bank holidays establishments can open. So that all the variables are in a range from 0 (minimal regulation) to 1 (maximum regulation), the six foregoing variables have been re-scaled using the min-max method.

144 The treatment is symmetrical to that applied to the weekly average for the opening time. That is to say, if there are no regulations, the closing time is 24 and, if it is not possible to open on Sundays, the closing time is 0.
145 If opening and closing times are not regulated, the maximum number of hours per day is 24, and, per week, 168; accordingly, the transformation of these two variables is zero.
146 Ideally, in each country, 52 would be replaced by 52 plus the number of bank holidays per year in each related country, but this information is not available for all countries.

IE	IT	LU	NL	PT	SK	ES	CY[2)]	MT
No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
National	Local	National	Nat./Loc.	Nat./Loc.	National	Nat./Reg.	National	National
	13			18			15	
				61		84	84:30	
	7	6	6	6			5	4
	7	6	6	6			5	4
	7	6	6	8		11		4
	22	21	22				20	19
	22	18	22				20	20
	22	13	22			23		22
							15 (Wednesday)	
							10	
	14		12			8	0	
No	Yes	No	Yes	Yes	No	Yes	Yes	Yes

Finally, all the variables have been aggregated with ad hoc weights, which are detailed in Table A22. Specifically, the six variables have been put into three groups, based on the type of regulation. The first group is the limits on opening and closing times, the second group is the maximum number of daily or weekly hours, while the third group is Sunday and bank holiday opening, and the minimum number of days establishments are closed, both per year. Each of these groups is assigned the same weight but, within each group, more weight is given to those situations that seem more restrictive from the standpoint of commercial practices (closing time instead of opening time, or opening on Sundays and bank holidays instead of the minimum number of days establishments are closed). The outcome is the indicator depicted in Chart 10. However, an exercise has been conducted on

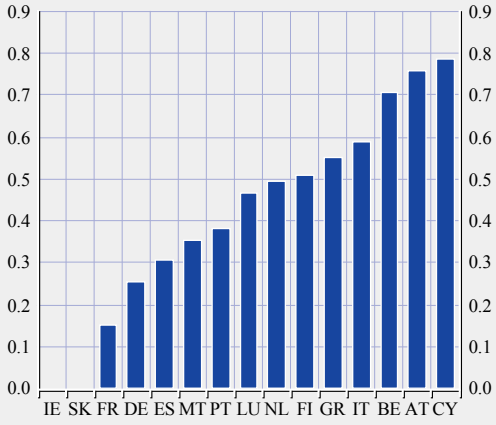
Table A22 Weights for the indicator

		Weights		
Group	Variables	Within group (a)	Group (b)	Final (c) = (a) x (b)
1	Opening time	0.25	0.333	0.083
	Closing time	0.75		0.250
2	Daily hours open	0.50	0.333	0.167
	Weekly hours open	0.50		0.167
3	Closing days	0.25	0.333	0.083
	Closing holidays	0.75		0.250

Source: Eurosystem staff calculations.

Chart A4 ESCB indicator of the degree of regulation of shop opening hours with identical weights

(range 0 to 1, from less regulated to more regulated)

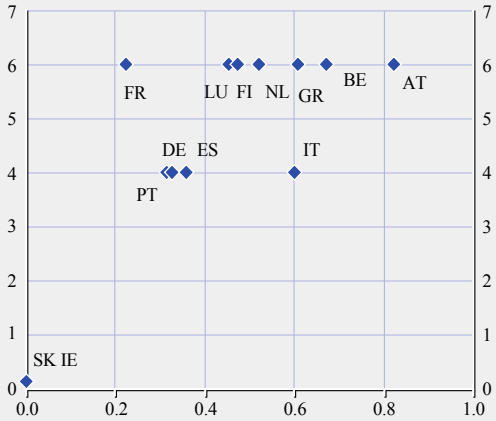


Source: Eurosystem staff calculations.

the sensitivity of the indicator to the weights, replicating the indicator assigning the same weight to the six variables, the result of which is given in Chart A4. Comparison of the charts shows that this change in weights does not entail substantial changes in the ordering of the countries, with the sole exception of Portugal, which moves from fourth to seventh in terms of countries with the least regulation, when the weights make no distinction based on type of regulation.

Chart A5 Comparison of OECD and Eurosystem opening hours indicators

x-axis: ESCB indicator (2010)
y-axis: OECD indicator (2008)



Sources: OECD and Eurosystem staff calculations.
Note: The ESCB indicator of the degree of regulation of shop opening hours has been computed on the basis of information from NCBs.

MEASURING CONCENTRATION USING EUROMONITOR DATA

As discussed above, the HHI is calculated by summing the square of the market shares of all companies in a given market. The precise calculation of the HHI requires information on the market size of all companies in the market. However, in the Euromonitor dataset, the market size of smaller firms is not recorded, but aggregated into the category "Others". Generally, the threshold for inclusion in this category is very low (usually a market share of below 0.1%). Hence, this should not have a big impact on the measure (especially as the market share is squared). Nonetheless, to ensure consistency across countries and sectors, where sometimes the thresholds may be higher, the following rule of thumb was employed for dealing with firms categorised as "Others". It was assumed that they have, on average, a market share of half the lowest recorded market share (e.g. if the lowest recorded market share is 0.1%, they are assumed to have a market share of 0.05%). Thus, if the market share of companies in the category "Others" is Y% and the lowest recorded market share is Z%, then it is assumed for calculating the HHI that there are Y/(Z/2) firms, each with a market share of Z/2.

The CR_k indicator is calculated as the cumulated market share of the top k companies in a given market. Similar to the practical issues faced when calculating the HHI, the calculation of the CR_k measure requires that information on at least k market players be available. In some instances, particularly in some sub-sectors of smaller countries, this is not the case. Therefore, to calculate the CR_k measures when information is not available for k companies, but only y companies, the following rule was adopted – the market share of the k-y companies was set to the minimum of half of the market share of the smallest recorded firm (i.e. y/2) or the market share of the firms in the category "Others" divided by 11-y (as the largest CR_k calculated is for ten companies).

STORE LOCATION DATA DESCRIPTION

The dataset consists of census-type data on non-specialised retailers[147] in ten euro area countries (Austria, Belgium, Germany, Spain, Finland, France, Greece, Italy, the Netherlands and Portugal). Data for Belgium were provided by the Nationale Bank van België/Banque Nationale de Belgique, drawing from different national sources, and refer to 2008. The remaining data were provided by Nielsen. The reference period for these data is 2010. The unit of observation is the store, for a total of 128,292 observations (see Table A23). Detailed information at the store level is provided in the dataset: name, address, banner name, outlet type, sales area in square metres (sq. m.), number of counters, turnover share. Moreover, the dataset is endowed with information about each store's membership of a parental company and/or buying group (if applicable).

To construct a dataset harmonised across countries, some data management was required.

The outlet type definition was not harmonised across countries, as the definition of hypermarkets and supermarkets may vary across countries.[148] Furthermore, the threshold (in terms of selling space in square metres) for inclusion in the dataset varied across countries.[149] The harmonisation criterion chosen was based on the sales surface range applicable to most of the countries:

- superettes (100-400 sq. m.),
- supermarkets (400-2,500 sq. m.),
- hypermarkets (2,500 and over).

Consequently, traditional shops with a sales area of less than 100 sq. m. were dropped from the sample, as they can represent a selected retail sector in many countries; furthermore, the large mixed retailers (shopping malls) were excluded from the final dataset, owing to overlapping and for reasons of comparability. For discounts, a dummy variable is present in most Nielsen datasets. Where it was not specified, NCB task force members were asked to construct the dummy, or a criterion based on the banner name was used (whenever possible).

As to the geographical dimension, many countries were provided with more aggregated details (NUTS2 in Table A23). The geographical detail is not an issue when considering the Nielsen dataset by itself, as the address

147 NACE G5211 sub-sector, non-specialised store with food beverages or tobacco predominating.

148 See http://www.insee.fr/fr/methodes/default.asp?page=definitions/hypermarche.htm and http://www.insee.fr/fr/methodes/default.asp?page=definitions/supermarche.htm as an example.

149 In Finland, Germany, the Netherlands and France, the smallest stores recorded have a selling space of 5 sq. m., 8 sq. m., 9 sq. m. and 20 sq. m., respectively. However, in Greece and Portugal, stores smaller than 50 sq. m. were not recorded, while in Belgium, Spain and Italy, stores smaller than 100 sq. m. were not recorded.

Table A23 Description of the Nielsen structural dataset (2010)

	AT	BE	DE	ES	FI	FR	GR	IT	NL	PT
NUTS3				X	X		X	X		
NUTS2	X	X	X			X		X	X	X
Sales area	X		X	X	X	X	X	X	X	X
Counters			X			X		X		X
Turnover share	X		X			X		X		
Buying group	X	X	X	X	X	X	X	X	X	X
Parental group	X	X	X	X	X	X	X	X	X	X
Store	X	X	X	X	X	X	X	X	X	X
Obs	4,999	3,725	32,216	16,269	2,827	17,682	3,033	29,482	4,375	3,932

Notes: Belgian data provided by the Nationale Bank van België/Banque Nationale de Belgique. Buying group for Greece imputed from external data source.

Table A24 Overview of the precision of geo-coding results

	Building/ address	Street	Postcode	City	Total	
EA	**75.6**	**14.2**	**9.1**	**0.8**	**100.0**	**128,292**
BE	90.0	6.8	3.2	-	100.0	3,731
DE	98.3	1.6	0.1	0.0	100.0	35,825
GR	27.1	11.1	30.4	31.4	100.0	3,046
ES	62.5	22.1	15.3	0.1	100.0	16,320
FR	50.5	34.1	15.4	0.0	100.0	20,009
IT	74.0	16.7	9.2	0.1	100.0	29,482
NL	91.8	1.6	6.6	0.0	100.0	4,989
AT	96.0	0.2	3.8	0.0	100.0	5,121
PT	45.0	20.6	32.9	1.5	100.0	5,281
SI	68.6	23.9	7.5	0.0	100.0	134
SK	35.3	53.7	0.7	10.3	100.0	437
FI	88.1	8.4	3.5	0.0	100.0	3,917

Sources: www.bulkgeocoder.com and Eurosystem staff estimates.

of the single store is available.[150] The problem arises when the very detailed store-level information is merged with the regional (NUTS2) CPI data (see Section 2.3 for the regional analysis). In this sense, the former needed to be transposed to the latter (broader) aggregation, as in Spain and Finland, for example. For other countries, like Italy, provided with both NUTS2 and NUTS3 dimensions, the regional analysis was based on NUTS2, as the Eurostat additional explanatory variables used to asses the correlation between concentration and price changes were available at this level, despite a very detailed regional CPI at NUTS3. For some countries, like Belgium and Greece, the NUTS2 aggregation has been retrieved through postcodes.

In order to provide the final dataset with a parental company and buying group for each country, some assumptions were made. Where not provided, it was assumed that the buying group for the hard discounters at the national level coincided with the global banner name. The parental company information was also used to provide an insight into the buying group if information on the latter was missing.

Finally, very few countries were provided with a measure of the turnover share (only Austria, Germany, France and Italy).

150 NUTS denotes Nomenclature of Units for Territorial Statistics. There are three hierarchies, with 97 NUTS1 regions, 271 NUTS2 regions and 1,303 NUTS3 regions in the European Union. In principle, NUTS2 regions should have a population in the range of 800,000 to 3 million, and NUTS3 regions 150,000 to 800,000. However, as countries often use existing administrative zones, this is only an indication rather than a precise guide.

Technical Box 1

ALTERNATIVE MEASURES OF PRICE DISPERSION AND CONVERGENCE

This box considers three measures of dispersion and/or convergence: (i) the standard deviation, (ii) the coefficient of variation and (iii) regression to the mean analysis. The first two are referred to as sigma (σ) convergence measures, while the third is known as beta (β) convergence.

(i) The **standard deviation** is the classical and most commonly used measure of the degree of variation or dispersion around the average (mean). A low standard deviation indicates low price dispersion and the fall in the standard deviation over time is interpreted as convergence. However, while the advantages of this measure are that it is easy to calculate and understand, is in the same "dimension" as the underlying variable and is widely used, the disadvantages of it are that it is not "scale-independent" and is not directly calculable using published PPP data on relative price levels which are index to reference (e.g. EU15 = 100). To extract the standard deviation of prices using PPP data, it is necessary to have a measure of the actual price level for the reference "country" (Eurostat usually publishes PPP data with either EU15 = 100 or EU 27 = 100).

(ii) The **coefficient of variation** is simply the standard deviation of a variable divided by its average or mean. It is used to correct for scale, but may provide a misleading picture of convergence depending on how prices are considered. As PPPs are presented as relative price levels (e.g. EU15 = 100), it is only possible to directly calculate the coefficient of variation (as the relative price levels are effectively demeaned). Similar to the standard deviation, a low coefficient of variation indicates low price dispersion and a fall over time is interpreted as convergence – although, as discussed below, this may not actually be the case.

(iii) The third measure, using **regression to the mean analysis** (so-called beta (β) regressions or beta (β) convergence), does not measure price dispersion per se, only the degree of convergence or divergence. Beta convergence is estimated using the following equation: $PLcc,tt / PLcc,0 = \alpha tt + \beta tt PLcc,0$, where PLcc,tt denotes the price level in a given country at the time tt, PL*cc*,0 denotes the price level in the same country in the base period, 0. If $\beta < 0$ and is statistically significant, then beta-convergence is said to take place. It is often used and has intuitive appeal, but may be biased towards significance. This bias has given rise to an extensive literature, referred to as the convergence (or Galton's) fallacy literature – see, for example, Neary (1988), Boyle and McCarthy (1999), Quah (1993), etc.

Regarding which measure, if any, is best, it turns out that this may depend on the underlying nature of the data. More specifically, it boils down to whether one believes that dispersion and convergence should be measured in absolute or percentage terms.

Technical Box 2

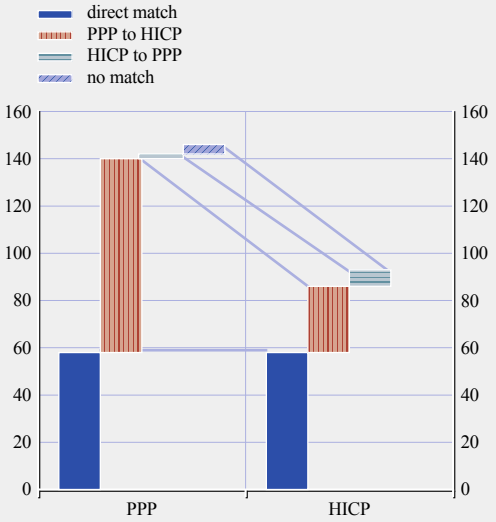
COMBINING PPP AND HICP DATA

As noted in the main text, Eurostat's PPP data are presented in the form of price level indices (PLIs), where a benchmark reference (normally EU-15 or EU-27) is equal to 100. Unfortunately, the PPP data are not designed to provide time series information on prices. This implies that one can only calculate the coefficient of variation and not standard deviations, as the PLIs are "rebased" or "re-meaned" to the benchmark each period, and data on the evolution of the average EU-15 price level from which the standard deviation could be backed out are not available.

In order to retrieve this information and to assess the impact of the general trend in the price level on measures of dispersion, PPP data (to provide a cross-section dimension) have been combined with HICP data (to provide a time series dimension). Price level indices have been obtained from Eurostat's PPP dataset for 146 consumption items. This level of disaggregation is more detailed than that available for the HICP (93 sub-components), particularly for food products. Of the 146 PPP data series, 58 directly match detailed HICP sub-component data on a one-to-one basis. 82 need to be aggregated somewhat to obtain 28 HICP series. There are a small number of series (mainly related to insurance) for which the HICP dataset is more detailed. Lastly, there are four PPP reference series (gambling, prostitution, narcotics and imputed rentals for housing) for which there is no HICP corollary. Thus, moving from PPP to HICP data, the number of available individual price series declines from 146 to 89 (see the Chart for an overview).

Matching detailed PPP and HICP data

(matching of (146) PPP series with (93) HICP series)



	Direct match	PPP to HICP	HICP to PPP	No match
PPP	58	82	2	4
HICP	58	28	7	0

Source: Eurosystem staff calculations.

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