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The functioning of the food supply chain and its effects on food prices

Accompanying document to the

**COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN
PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL
COMMITTEE AND THE COMMITTEE OF THE REGIONS**

FOOD PRICES IN EUROPE

Including a roadmap to improve the functioning of the food supply chain

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The functioning of the food supply chain and its effects on food prices

1. INTRODUCTION AND BACKGROUND

In the second half of 2007 price increases of many agricultural commodities accelerated rapidly and by early 2008 reached exceptional levels. These increases have been mainly driven by a temporary imbalance between demand and supply – against the background of structurally rapidly increasing demand for food products across the globe. The agricultural commodity price surge generated a rapid increase in consumer food prices, which peaked in July 2008. Within the EU the largest producer and consumer food price increases were reported in the new Member States. In the light of these developments, the Commission decided in its May 2008 Communication "Tackling the challenge of rising food prices - Directions for EU action"¹ to investigate the functioning of the food supply chain with the following objectives: 1) to better understand how the degree of competition in the food industry and the downstream retail markets may have affected price developments; 2) to identify some best regulatory practices and formulate recommendations; and based on this 3) to identify possible actions at the Community level. This analysis has benefited from consultations and discussions with Member States including competition and regulatory authorities, as well as dialogues with stakeholders in the markets along the food supply chain.

The food supply chain is complex. It is composed of a wide diversity of products and companies which operate in different markets and sell varied food products to various types of purchasers. The regulatory framework affects the food supply chain at all levels from the agricultural sector down to retail. The degree of market power held by the firms along this chain varies by product category and is influenced by the relevant markets in which these firms operate. It has an impact on the contractual relationships between the main players along the chain and can influence the degree of transmission of the increase in agricultural commodity prices into consumer prices.

Given the complexity of the food supply chain, general conclusions regarding its functioning should only be drawn with caution. This document attempts to contribute to a better understanding of the functioning of the food supply chain in order to allow a more informed debate on policy proposals. It also identifies a number of issues that would merit further in-depth analysis. The policy recommendations derived from this analysis are presented in the Communication "Food prices in Europe: Including a roadmap to improve the functioning of the food supply chain".

The present staff working paper starts with a description of the food supply chain and its constituent sectors, thus setting the framework within which interactions between firms take place. In section 3, the paper provides an overview of the economic importance and performance of the sectors belonging to the food supply chain. Section 4 makes an analysis of the food price transmission mechanism, looking in particular at the pass-through of price developments along the food supply chain. The regulatory framework and its possible impact

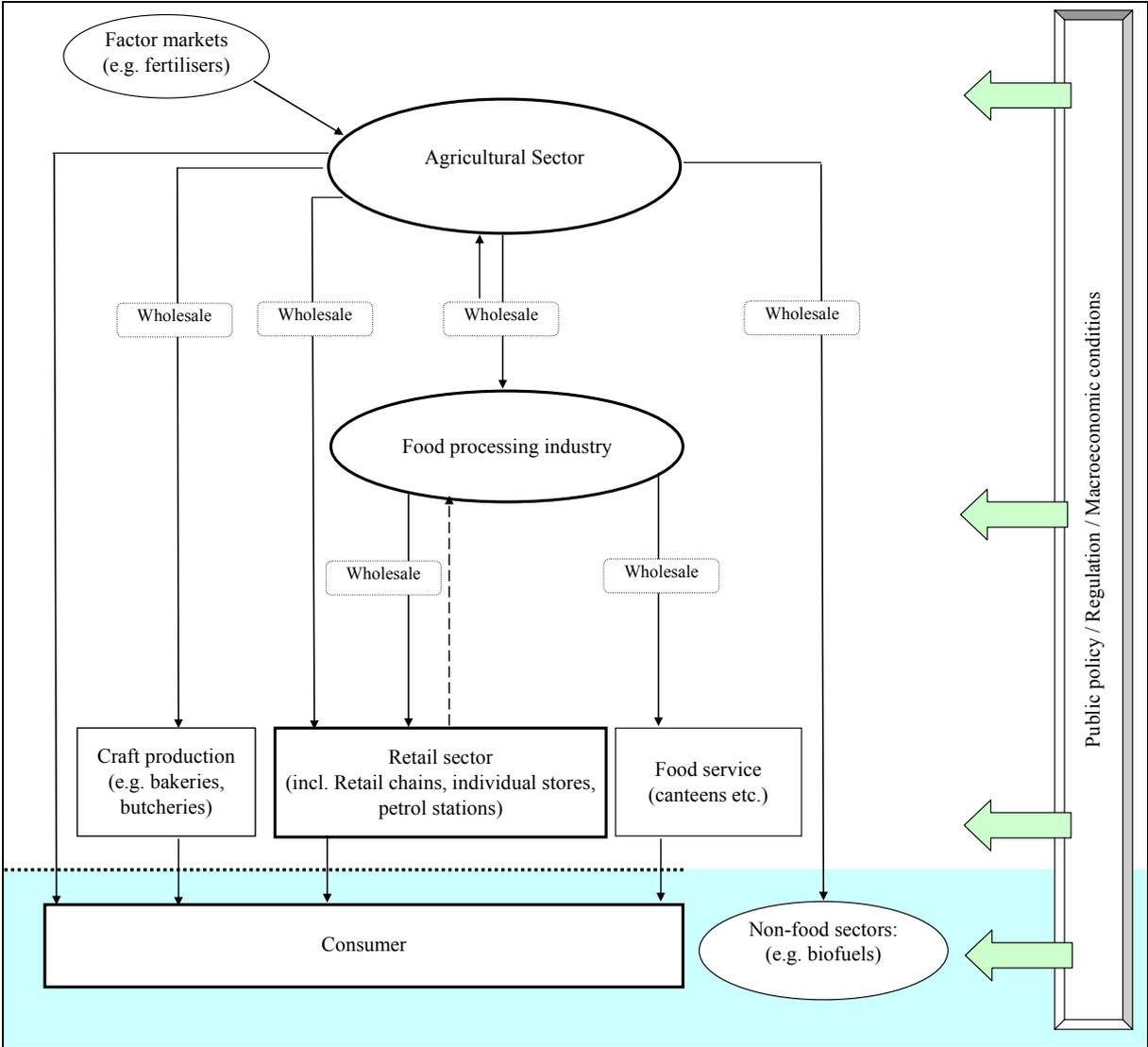
¹ COM(2008) 321/3, "Tackling the challenge of rising food prices - Directions for EU action".

on prices is analysed in section 5. Section 6 gives an overview of the conditions of competition along the food supply chain. Section 7 concludes.

2. COMPLEXITY OF THE FOOD SUPPLY CHAIN

The food supply chain connects three main sectors (see Figure 1): the agricultural sector, the food processing industry and the distribution sectors (wholesale and retail). Basic agricultural commodities undergo, to varying degrees, substantial series of intermediate alterations before they are sold as final food products to consumers. Therefore, a description of the food supply chain helps to better understand how prices are formed along this chain, how input costs are passed on, where interactions between firms take place and where different regulations may have an impact. However, since specific food supply chains exist for every single food item purchased by consumers, the following description is a necessary simplification.

Figure 1: Schematic representation of the food supply chain



Source: own presentation

The first sector considered in the food supply chain is the agricultural sector. Its activities include crop production and the raising of livestock. As agricultural commodities comprise very different products, the sector's distribution channels are equally diverse. Firms in the agricultural sector primarily sell their output to the food processing industry and to itself (e.g. animal feed), but can also directly sell to retailers, final consumers or alternative markets (e.g. biofuels). The food processing industry is very heterogeneous and comprises a number of varied activities. These include for example refining (sugar), milling (cereals), cleaning, cutting or drying (fruit and vegetables) and slaughtering and disassembling (livestock). The different inputs are processed in successive stages and to different degrees, packaged and dispatched to customers (e.g. distributors, food service). Another important activity of food manufacturers is to carry out market and product research leading to the development of new products, and to engage in marketing. The distribution sector (and retail in particular) is the principal outlet for food products and, being the final link in the supply chain, it interacts directly with final consumers. While the sector's main activity is the sale of products, in doing so, retailers may also carry out services for food manufacturers, such as promotional activities.

The moves forward along the supply chain – between, but also within sectors – imply a transfer of intermediate goods between firms. These transfers can occur directly between firms involved in production or sale to consumers or, as is often the case, via specific wholesalers. Transfers can be analysed from both a contractual and a technical perspective. The contractual aspects essentially refer to buyer-seller interactions and are influenced by the relative market power of the firms along the chain (see section 4 and 6). On the technical side, the transfer involves a series of activities which generate additional costs, such as those incurred for transport, storage and logistics. Therefore, besides the raw material – which in general accounts for a small share of total costs only² – the cost structure of food production comprises a number of other cost factors, most notably transport energy and labour, which are reflected in the final consumer prices. In addition, the functioning of the food supply chain is also affected by a number of external factors such as regulation, public policy and the macroeconomic environment, which impact cost structures and price developments across Member States.

The cost structure not only varies by product depending on the number of intermediate steps and the degree of processing but is also likely to vary across countries, even for comparable goods (see also section 4.2). Therefore, the effect of an increase in the raw material price may have different repercussions across countries: while "other costs" raise the final consumer prices, they can either mitigate raw material price increases or exacerbate them, if the price of other cost elements also rises.

While each product has its own cost-structure, first indications of how these structures vary by product category and sector can be inferred from input-output tables. A simple analysis shows that the share of intermediate products (excluding wages) is substantially higher for food processing industry than for the distribution (wholesale and retail) sectors. For the food processing industry, the cost share of intermediate products is about 70%, even though this varies across countries and type of product. For the distribution sectors this share is around

² Generally speaking agricultural commodity shares of 20%-30% on average in the costs of consumer food products seem to be good approximations.

40%. Energy and transport on average represent around 10% of the costs of the food processing industry, but fluctuate considerably across food categories, and are higher for wholesale trade. The costs of rent account for a large part of the costs incurred by the retail sector. The input-output tables also highlight the importance of marketing and advertising costs, notably in sectors producing confectionery, cereals or beverages. Finally, compensation of employees accounts for a larger share in distribution (around 30%), than in food processing (around 20%).

The remainder of this document takes developments in the agricultural sector as given, and focuses on the food processing industry and the distribution sector.

3. ECONOMIC IMPORTANCE AND EFFICIENCY OF SECTORS ALONG THE FOOD SUPPLY CHAIN

This section shows that the sectors belonging to the food supply chain, in particular the food processing industry and the distribution are economically important and have many interactions with other sectors of the economy, either as purchasers or as suppliers of intermediate inputs. Therefore, a malfunctioning of the food supply chain can have significant repercussions on the whole EU economy. This analysis also shows that there is a room for improving the efficiency of this chain, which is particularly relevant in the present economic conditions. Reforms improving the functioning of the food supply chain could contribute to preserve the purchasing power of households, particularly of low income households which spend a relatively larger proportion of their expenditures on food products. It is also essential in a period of deceleration of price increases to ensure that the downwards price movement are transmitted to consumers without delay (see also section 4).

3.1. Share in EU value added, employment and consumption expenditure

The sectors making up the food supply chain – agriculture, food processing and the food distribution sectors – can be considered as economically important as they jointly account for approximately 6% of EU value added and 12% of EU employment. The food and beverages industry makes up 1.7% of EU value added, while the wholesale and retail sectors (including non-food products) account for 3.8% and 4.5% respectively (see table 1). The size of these two sectors is typically larger in new Member States. For example, while the value added share of the food and beverage industry and of the wholesale and retail trade equalled 1.7% and 8.3%, respectively in 2005, they represented 2.6% and 13.2% respectively in the new Member States. The value added share of the food and beverage industry is particularly high in Ireland (4.1%) and Lithuania (3.6%), that of the wholesale trade sector in the Baltic States (12.4% in Latvia, 7.9%, in Estonia and 7.6% in Lithuania) and in the Slovak Republic (7.7%) and that of the retail trade in Poland (7.8%), Lithuania (7.4%) and Greece (7.3%).

The European food and beverage industry employs around 4.5 million persons, accounting for 2.3 % of total EU employment in 2005. The European distribution sectors (including non-food items) employ over 26 million persons or 13% of total EU employment, with the wholesale trade sector accounting for 4.4% and the retail sector representing 8.5% of total employment. More than a third of them (3% of all employees) are active in food retail. The

share of employment in the food and beverage industry and of in wholesale trade is higher in the new Member States than in the EU15.

Table 1: Sector shares in total valued added and total employment (in %), 2005

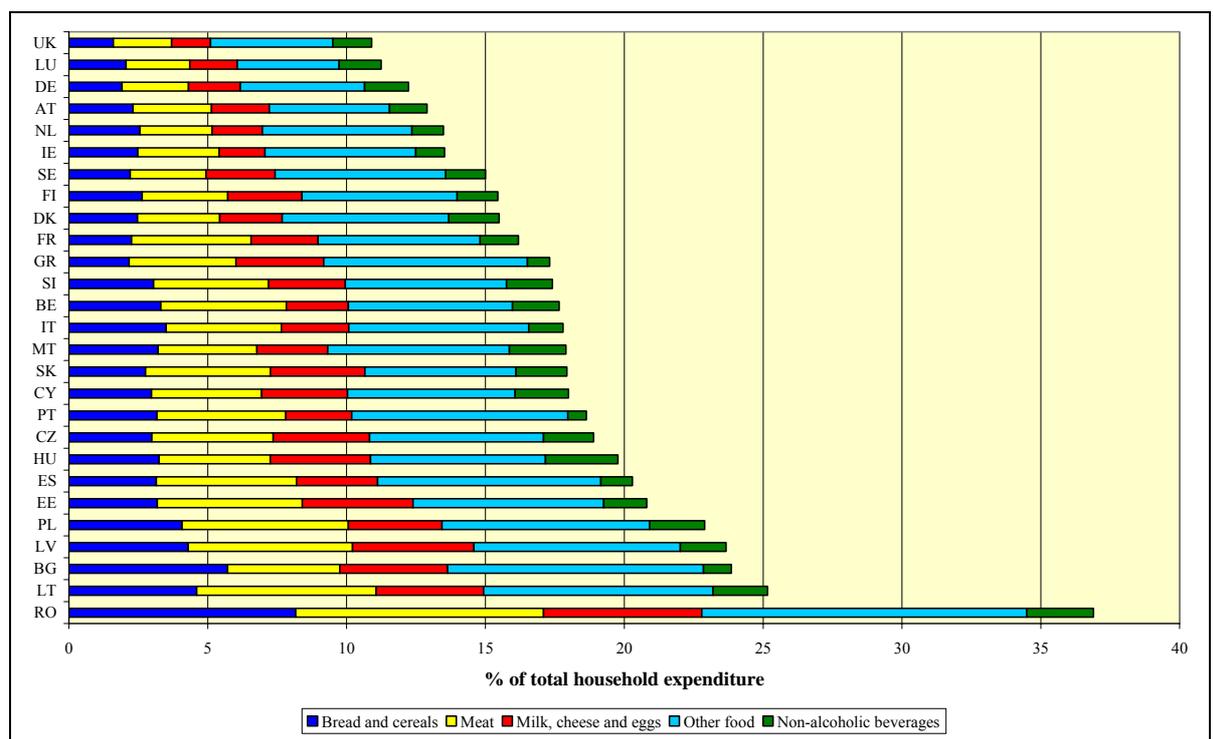
	Sector share in total value added				Sector share in total employment				
	Agriculture	Food and beverages	Wholesale trade*	Retail trade*	Agriculture	Food and beverages	Wholesale trade*	Retail trade*	Total Food Retail
Austria	1,1%	1,8%	6,5%	4,4%	11,1%	1,9%	5,0%	7,6%	2,6%
Belgium	0,9%	2,2%	7,1%	4,2%	1,9%	2,2%	5,2%	7,3%	2,9%
Bulgaria	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Cyprus	3,5%	2,7%	5,3%	5,6%	7,1%	3,7%	6,6%	8,5%	2,4%
Czech Republic	2,3%	2,7%	6,9%	4,4%	3,1%	2,8%	4,8%	7,6%	2,9%
Denmark	1,2%	2,1%	6,7%	3,6%	2,7%	2,5%	6,2%	7,4%	2,8%
Estonia	2,1%	2,6%	7,9%	5,2%	3,3%	3,6%	5,6%	5,9%	3,2%
Finland	1,1%	1,7%	5,3%	3,5%	4,1%	1,6%	4,2%	6,5%	2,2%
France	2,0%	1,9%	4,6%	4,3%	3,3%	2,2%	4,1%	7,4%	2,8%
Germany	0,8%	1,7%	4,4%	4,1%	2,1%	2,4%	4,1%	8,7%	2,2%
Greece	4,8%	2,3%	3,7%	7,3%	11,8%	2,9%	2,6%	10,5%	4,1%
Hungary	4,2%	2,5%	4,8%	4,8%	4,4%	3,5%	2,4%	10,5%	3,6%
Ireland	2,5%	4,1%	4,4%	4,4%	5,4%	2,8%	3,5%	7,8%	4,1%
Italy	2,1%	1,8%	5,5%	4,4%	3,8%	1,9%	4,7%	7,5%	2,6%
Latvia	2,4%	2,7%	12,4%	5,4%	4,9%	3,3%	5,1%	9,6%	4,2%
Lithuania	5,1%	3,6%	7,6%	7,4%	10,0%	3,4%	6,5%	6,8%	3,8%
Luxembourg	0,4%	0,9%	4,7%	3,2%	1,3%	1,4%	4,9%	6,2%	1,6%
Malta	2,1%	2,4%	6,2%	4,7%	2,3%	2,6%	6,2%	7,2%	0,0%
Netherlands	2,1%	2,1%	7,8%	3,3%	3,2%	1,6%	5,8%	9,0%	3,2%
Poland	4,2%	2,8%	7,4%	7,8%	18,6%	3,5%	5,2%	8,3%	3,9%
Portugal	2,1%	2,3%	5,6%	4,6%	11,2%	2,2%	6,1%	8,3%	2,8%
Romania	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Slovak Republic	3,1%	2,2%	7,7%	6,5%	3,2%	2,3%	7,4%	9,1%	1,2%
Slovenia	2,3%	1,9%	5,4%	4,7%	9,9%	2,3%	4,8%	5,8%	2,8%
Spain	2,9%	2,0%	4,4%	4,7%	4,7%	2,4%	3,5%	8,9%	3,4%
Sweden	0,5%	1,5%	5,9%	3,7%	1,6%	1,4%	5,0%	5,6%	2,3%
United Kindgom	0,9%	1,9%	4,4%	5,7%	1,3%	1,5%	4,2%	10,5%	4,4%
Euro Area	n.a.	1,9%	5,1%	4,3%	4,1%	2,2%	4,4%	8,2%	2,7%
EU27	1,2%	1,7%	3,8%	4,5%	4,6%	2,3%	4,4%	8,5%	3,2%
NMS	3,1%	2,6%	6,9%	6,3%	11,1%	3,3%	5,0%	8,4%	3,4%

Source: *ESTAT (food retail) and EUKLEMS*

Note: (*) Wholesale and retail excludes motor vehicles and motorcycles

The economic importance of the food supply chain can also be gauged by the share of its final products – food and beverages – in household expenditure. On average 16% of EU household spending is devoted to food and beverages. This share typically falls as per capita GDP rises and vice versa. Consequently, the share of food expenditure is typically higher in the new Member States, where in many cases it exceeds 20%.

Figure 2: Composition of food consumption basket by Member State, 2008



Source: Eurostat (based on HICP weights)

The food processing industry and the wholesale and retail trade can also help to improve the capacity of the EU to adjust. Indeed, these sectors have important linkages with other sectors of the economy. This means that the market performances of these sectors (in terms of price, quality, variety etc.) have immediate repercussions on the rest of the economy, as well as final consumers. In other words, market inefficiencies in these sectors will propagate throughout the economy and ultimately hamper performance in upstream and downstream sectors. Moreover, the wholesale and retail trades can be categorised as important users of information and communication technologies and therefore, they can contribute to the diffusion of new technologies, which is another dimension of the adjustment of an economy.

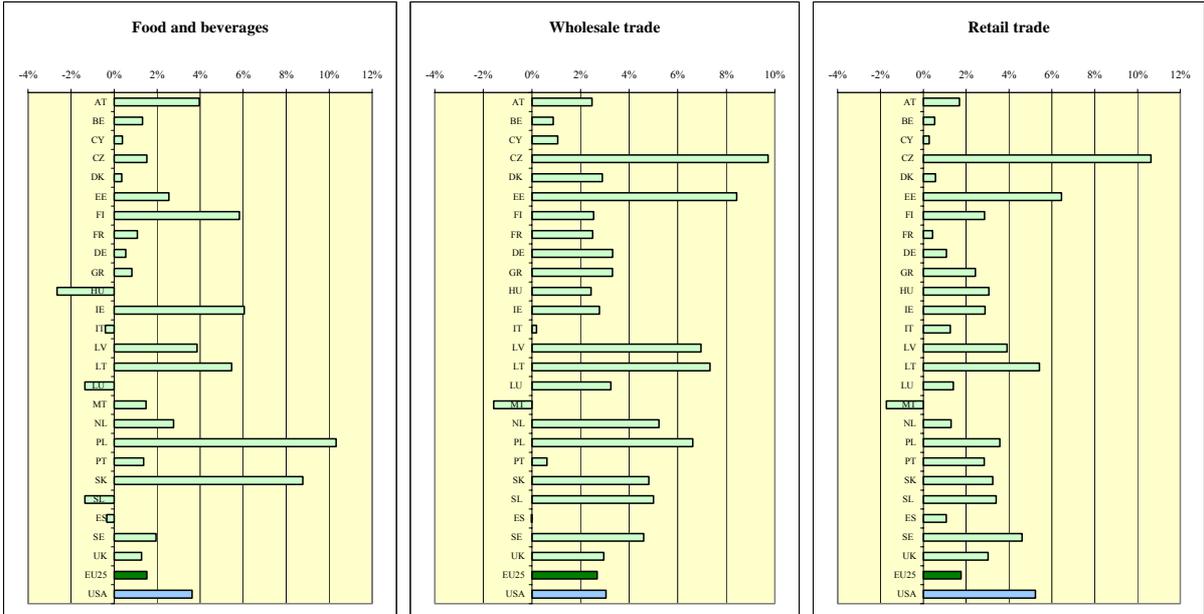
3.2. Economic performance: productivity and innovation

An analysis of labour productivity growth in the three sectors of the food supply chain (food processing industry, wholesale and retail) reveals that the average annual growth rate over the period 1995-2005 was lower in the EU than in the US in all these three sectors. The EU-US gap is significant in the case of the food-processing (2.1 percentage points) and retail sectors (3.5 percentage points), but relatively narrow in wholesale trading (0.3 percentage points). Such differences could indicate that there may be room for further improvement in the efficiency along the food supply chain.

In the food and beverages industry, the labour productivity growth over the period 1995-2005 has been particularly slow (or even negative) in Cyprus, Denmark, Italy, Luxemburg, Malta and Spain. Among the old Member States, high productivity growth in this sector has been observed in Austria, Finland and Ireland and among the new Member States in Latvia,

Lithuania Poland and the Slovak Republic. In the wholesale and retail trade, the dispersion in the labour productivity performance among the Member States is larger than for the food and beverage industry. The countries having recorded the lowest labour productivity growth rates over that period are Spain (wholesale), Cyprus (retail) and Malta (wholesale and retail). The highest rates in both distribution sectors have been observed in the Czech Republic, Estonia and Lithuania.

Figure 3: Labour productivity growth in the EU food and beverages industries, wholesale and retail trade, 1995-2005



Source: Calculations based on EUKLEMS

The productivity gap with the US in the retail sector³ has been explained by a lower use of information and communication technologies (ICT) in the EU. It is plausible that different degrees of ICT adoption partially explain cross-country productivity gaps in the EU. The remaining segmentation of the European Single Market which is illustrated by the diverging price levels and price developments across countries (see section 4) may also contributed to the lower productivity performance of the EU. But other causes of the productivity differentials observed across countries include differences in the intensity of competition, in the regulatory framework and in labour market policies, as indicated in a recent analysis made on the possible causes of malfunctioning on EU product markets⁴. Labour productivity growth in the three sectors considered here has generally been higher in the new Member States. This most likely reflects catching-up effects and lower initial productivity levels.

Innovation can lead to efficiency gains, both through the introduction of new and better production methods, and through the introduction of new and better products, which raises the long term productivity growth rate. In addition to the effect on the firms producing them,

³ It should be noted that these indicators apply to the retail and wholesale sectors as a whole, and may not fully reflect developments in the distribution of food.

⁴ See European Economy, Economic Paper n° 271 at http://ec.europa.eu/economy_finance/publications/publication_summary13085_en.htm

novel products can ensure that consumers have a wide choice of food products, satisfying their health and value expectations. Innovation takes place at all levels of the food supply chain. Examples from the food industry include development and subsequent launch of new products. In the retail sector innovation activities could for example focus on distribution channels, store design, new services making it easier and quicker for consumers to do their shopping (e.g. ordering via internet and collecting the products at the outlet), etc.

Innovation can be examined from an input side (i.e. investment in R&D, both private and public⁵, and research personnel) and an output side (i.e. innovation per se). Data from the Community innovation survey suggest that firms in the food and beverage industries are more likely to pursue R&D activities than firms in other sectors of the EU economy. Firms in the distribution sectors are generally less likely to be involved in R&D activities and also spend less on them, which can largely be explained by the nature of their core activities.

In terms of innovation outcome, the proportion of firms succeeding in product innovation – i.e. the development of new or improvement of existing products and services – is higher in the food and beverage industry compared to other sectors. Inherent to their function, the distributive sectors are effectively engaged to a far lesser extent in product innovation than other sectors. However, the retail sector seems relatively successful in terms of process innovation – i.e. the way in which products and services are produced.

4. DETERMINANTS OF CONSUMER FOOD PRICE DEVELOPMENTS IN THE EU

This section presents and discusses the results of an empirical analysis of the determinants of consumer food price developments in the EU. It investigates the price transmission mechanism along the food supply chain (from agricultural commodity prices and producer food prices to consumer food prices).

4.1. Recent developments in food prices

In the second half of 2007, price increases of many agricultural commodities accelerated rapidly and reached exceptional levels by the end of the year. The agricultural commodity price surge generated a rapid increase in producer and consumer food prices within the EU (see figure 4). Even more striking was the wide dispersion in terms of the magnitude of consumer food price increases between EU Member States. Within the EU the strongest food price increases, at both producer and consumer level, were recorded in the new Member States. In Bulgaria, Latvia and Lithuania price levels increased by more than 15% between July 2007 and August 2008. Among the old Member States, consumer prices rose by more than 6% over this period in Austria, Denmark, Ireland and the UK.

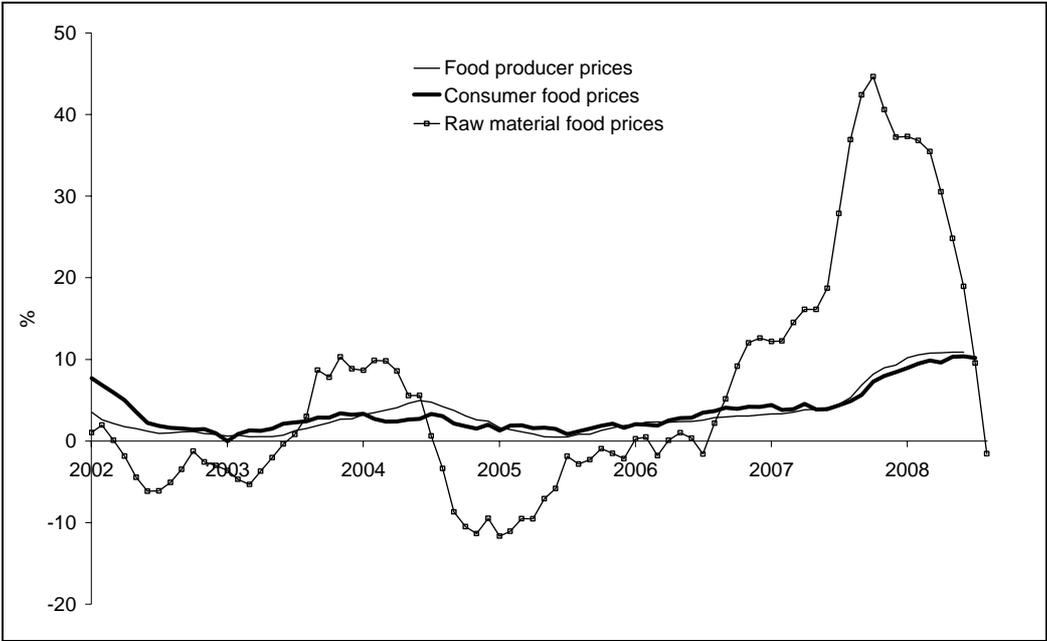
Moreover, in nearly all Member States processed food prices increased more rapidly than unprocessed food prices.⁶ The differences observed in price developments between processed

⁵ At the Community level, the Commission has already invested about €135 million in food research projects through its different research framework programmes.

⁶ The 'processed food' category is a weighted average of the following product categories: 'Bread and cereals', 'Milk, cheese and eggs', 'Oils and fats', 'Sugar, jam, chocolate and confectionery', 'Food products not elsewhere classified', 'Coffee, tea and cocoa', 'Mineral waters, soft drinks, fruit and

and unprocessed food appear mostly due to composition effects. The category "Processed food" includes food products that are produced on the basis of commodities most affected by the international price increases, notably cereals and dairy products. The input costs for the category "unprocessed food" – including meat – have increased much less. Moreover, the sharp increases in fuel prices may have had a greater effect on processed food prices.

Figure 4: Consumer, producer and raw material food price increases in the EU over the period 2002:1-2008:8 (y-o-y growth rates)



Source: Own calculations based on ESTAT and DG AGRI

The share of food in the household expenditure differs significantly across EU countries (see figure 2 in section 3.1) and is strongly correlated with GDP per capita. As the weight of food in household consumption baskets is typically higher in new Member States, the contribution of food inflation to overall inflation was also higher in these Member States.

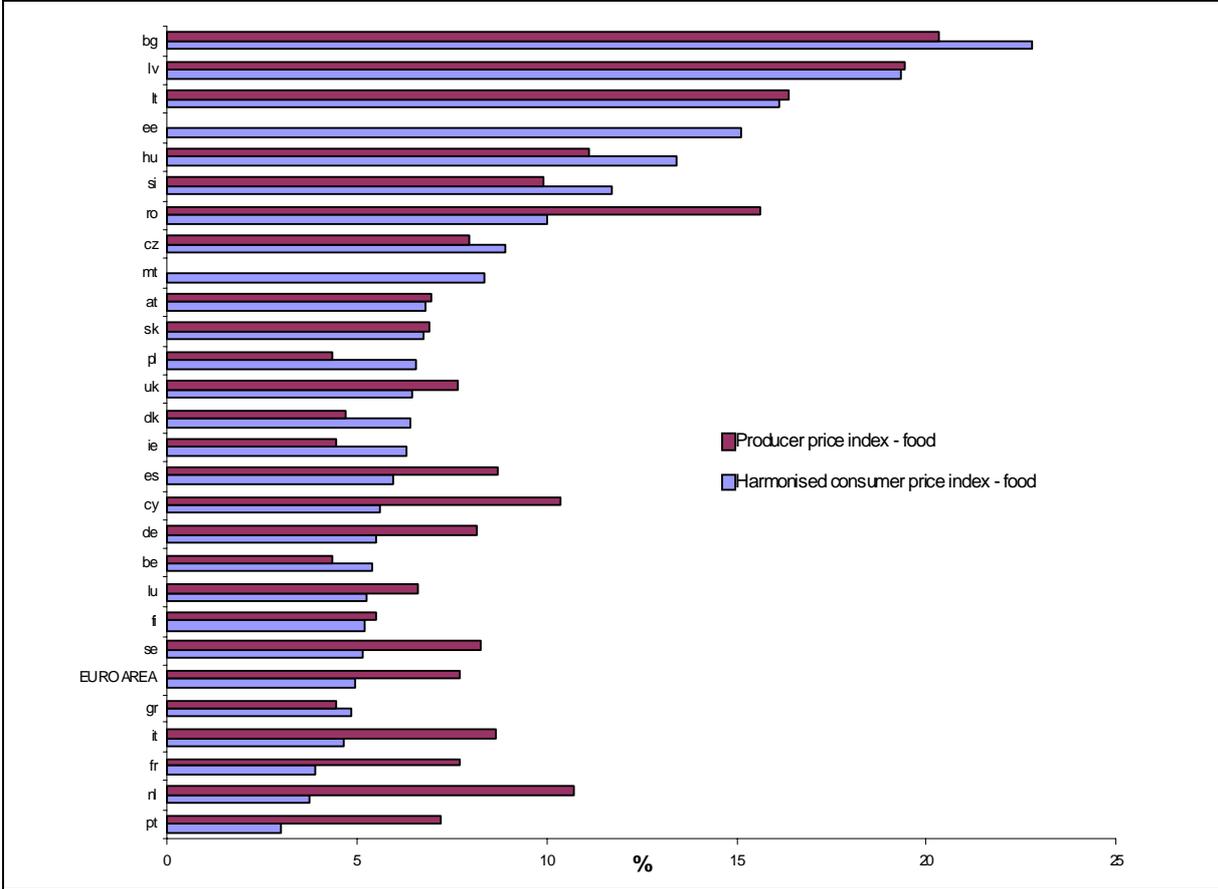
Due to the inelasticity of the demand for food the recent price increases have had a negative effect on the consumers' purchasing power, and there are indications of changes in purchasing behaviour (e.g. switching to discounters) and reductions in the purchase of number of food products they typically purchased. Households in the new Member States were hit harder than others. At the EU level the food price increases of 2007 and early 2008 reduced household purchasing power by around one percent.

After having reached its peak in May-June 2008, consumer food price inflation has been on a decreasing trend in all Member States with the exception of Slovenia. This decrease in consumer price inflation followed the decline in producer price inflation, which peaked in

vegetable juices' and 'Alcoholic beverages'. The 'unprocessed food' category is a weighted average of the following product categories: 'Meat', 'Fish', 'Fruit' and 'Vegetables'.

April-May 2008. However, differences between Member States in terms of price stickiness can be observed. While in some countries consumer food prices appear to have adjusted downward rather quickly following the decline in agricultural price levels, in others consumer prices have reacted more slowly (see also section 4.3).

Figure 5: Consumer and producer food price changes 2007:7 - 2008:8 (average annual growth rate)



Source: Eurostat

Changes in agricultural commodity prices can only partly explain the changes in consumer food prices observed. Other macroeconomic factors and factors related to the degree of competition along the food supply chain, the regulatory environment, wage developments and changes in tax rates have played a role as well.

A salient aspect of the analysis is the observation that the largest food price increases have occurred in the new Member States (see figure 5). This has been influenced both by the generally higher levels of wage and price inflation in these countries, but also by the fact that agricultural commodities take up a greater share in the cost structure of food products in the new Member States than in the old Member States. Prices in the new Member States would therefore be more sensitive to increases in the price of agricultural commodities. Prices and price changes could also be impacted by the functioning of downstream market conditions in these countries. Currency appreciation appears to have had a dampening effect on food prices in countries such as the Czech Republic, Poland, Romania and Slovakia.

4.2. The pass-through and price stickiness along the food supply chain

When investigating the pass-through of agricultural commodity prices and producer prices to consumer prices, a distinction should be made between the magnitude and the speed of the pass-through. The magnitude measures how much of the initial price change is reflected in the changes in consumer prices observed. The shorter the lag with which consumer prices follow commodity and producer prices, respectively, the higher the speed of pass-through. Finally, one needs to consider the degree of asymmetry between the effects of price increases and price decreases. One could make the proposition that in order to raise their profit margins actors along the food supply chain would have an interest to pass through price increases more rapidly than price decreases. As a result the measured pass-through would differ in the case of price increases from that in the case of price decreases. The magnitude, the speed and the degree of asymmetry in the pass-through are influenced, among others, by market conditions.

4.2.1. *The pass-through from agricultural commodity prices to consumer prices*

This section investigates the extent to which agricultural price increases have been passed through to the final consumer prices. For the purpose of this analysis, this pass-through is calculated as the ratio of the price increase of consumer food product over the price increase of the agricultural commodity used as an input, taking into account the necessary time lag.

The pass-through has been computed for two specific supply chains: from cereals (as a raw material) to "bread and cereals" and from milk (farm gate) to "milk, cheese and eggs". The pass-through for the "Food" category as a whole has not been calculated given the difficulty to aggregate agricultural input prices.

The average pass-through across the EU of an increase in the cereal price to "bread and cereals" supply chain is 28% (see box 1). In other words, the consumer price increase is around one third of the price increase of the agricultural input used. However, there is a large cross-variation in this pass-through, which varies from 9% in France to 64% in Estonia. With the exception of Greece and Spain, the countries with a pass through above the EU average are all new Member States. Even though the levels of pass-through for "milk, cheese and eggs" are generally higher than that of "bread and cereals", their variation across Member States is less pronounced, ranging from 25% in Greece to figures above 100% in Slovenia, Finland and Estonia.

The analysis of the pass-through in these two specific supply chains globally confirms the fact that food related markets in the Member States have different cost structures and appear to have reacted very differently to the 2007 agricultural price rise. This observation is confirmed in the following two sub-sections, which focus on the developments in the upstream and downstream parts of the supply chain, respectively.

The recent drop in agricultural raw material prices has not yet fully reflected in consumer food prices in most Member States. Downwards price adjustment seems especially slow in the specific supply chain 'Bread-making Common Wheat' to 'Bread and Cereals'. However, the decline in milk raw material prices is starting to push consumer milk prices down in some

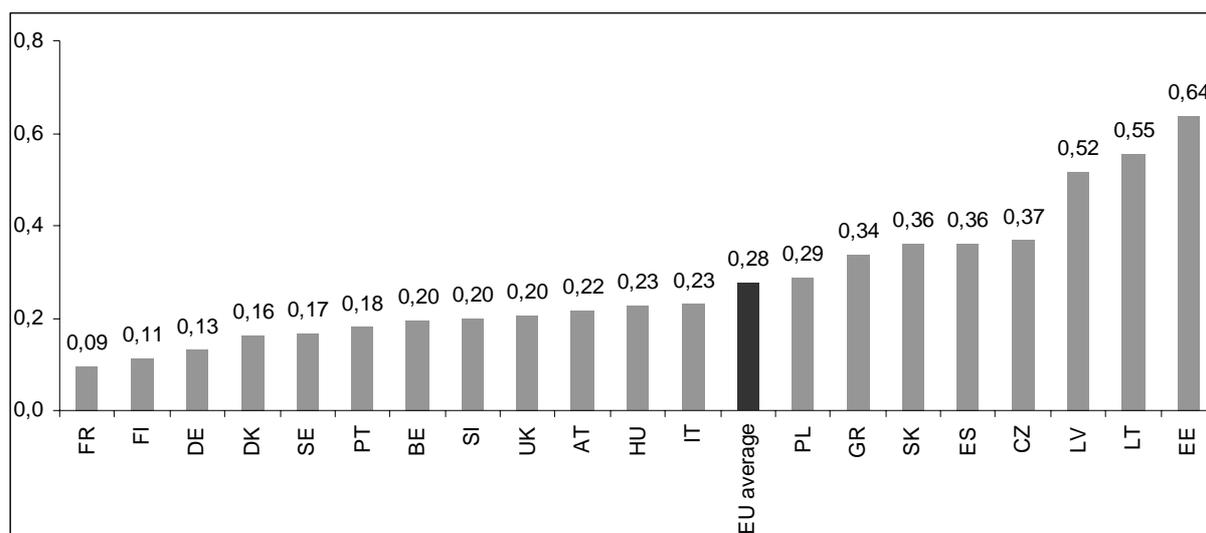
Member States.

Box 1. Relation between bread-making common wheat prices and bread and cereals prices

During the year 2007, the price of bread-making common wheat in the EU has increased by 63% in nominal terms. Behind this average increase, there is a wide variation of price increases across Member States, ranging from around 35% in Lithuania and Slovenia to more than 70% in Sweden and Denmark.

As can be seen in the figure B.1, the average pass-through from bread-making common wheat prices to bread and cereals prices – defined as the ratio of the percentage increase in prices of food products over the percentage increase in prices of the agricultural commodity used as an input – was 28% in the EU during the recent period of exceptional increase of agricultural commodities.

Figure B.1: Ratio of changes in bread prices over common wheat prices, 2007



Source: Statistical Analysis of the Food Price Increase, DG MARKT, mimeo

The most striking feature of this graph is the wide magnitude in the differences in levels as regards the pass through in the “Bread and cereals” supply chain, ranging from 9% (France) to 64% (Estonia). This could be the result of different market situations at different levels of the supply chain (e.g. competition and efficiency along this supply chain). These differences may also be due to composition effects and reflect the fact that the share of the primary input (i.e. wheat) is likely to be lower in those countries where the observed ratios are low, and the cost share of inputs other than wheat is consequently higher. The value of the pass-through amounted to around 20% in nine Member States (Denmark, Sweden, Portugal, Belgium, Slovenia, the UK, Austria, Hungary and Italy). In Poland, Greece, Slovakia, Spain and the Czech Republic the ratio was between 30% and 40%, while it exceeded 50% in Latvia, Lithuania and Estonia.

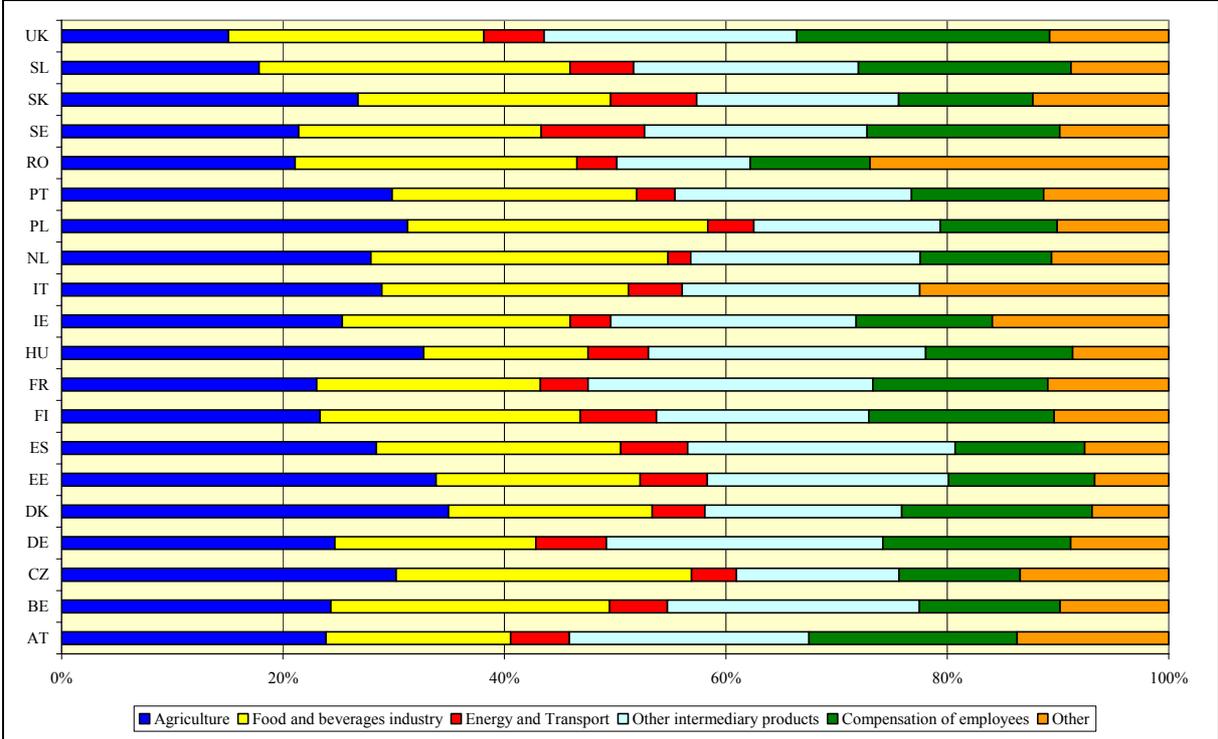
With the exception of Greece and Spain, the countries with a pass through above the EU average are all new Member States. The three Baltic States for which the price increase of wheat have been among the lowest, rank in the top 3 in terms of a pass-through.

4.2.2. Production costs and producer prices in the food processing industry

This section aims to assess whether the changes in producer prices, i.e. the prices that the industry charges to wholesalers and retailers, observed in the different Member States (see figure 5) reflect changes in the production costs in the food and beverages industry. As no direct information on production costs is available, input-output (I/O) tables and price changes of the main inputs categories (i.e. compensation of employees, agricultural inputs, energy and transport, inputs coming from food processing industry itself, as well as other intermediary products) are summarised in a weighted cost index for the food and beverage industry of

individual Member States. The changes in this index are then compared to the observed changes in the producer price index for the food and beverage industry.

Figure 6: Cost structure of the food and beverage industry by Member States

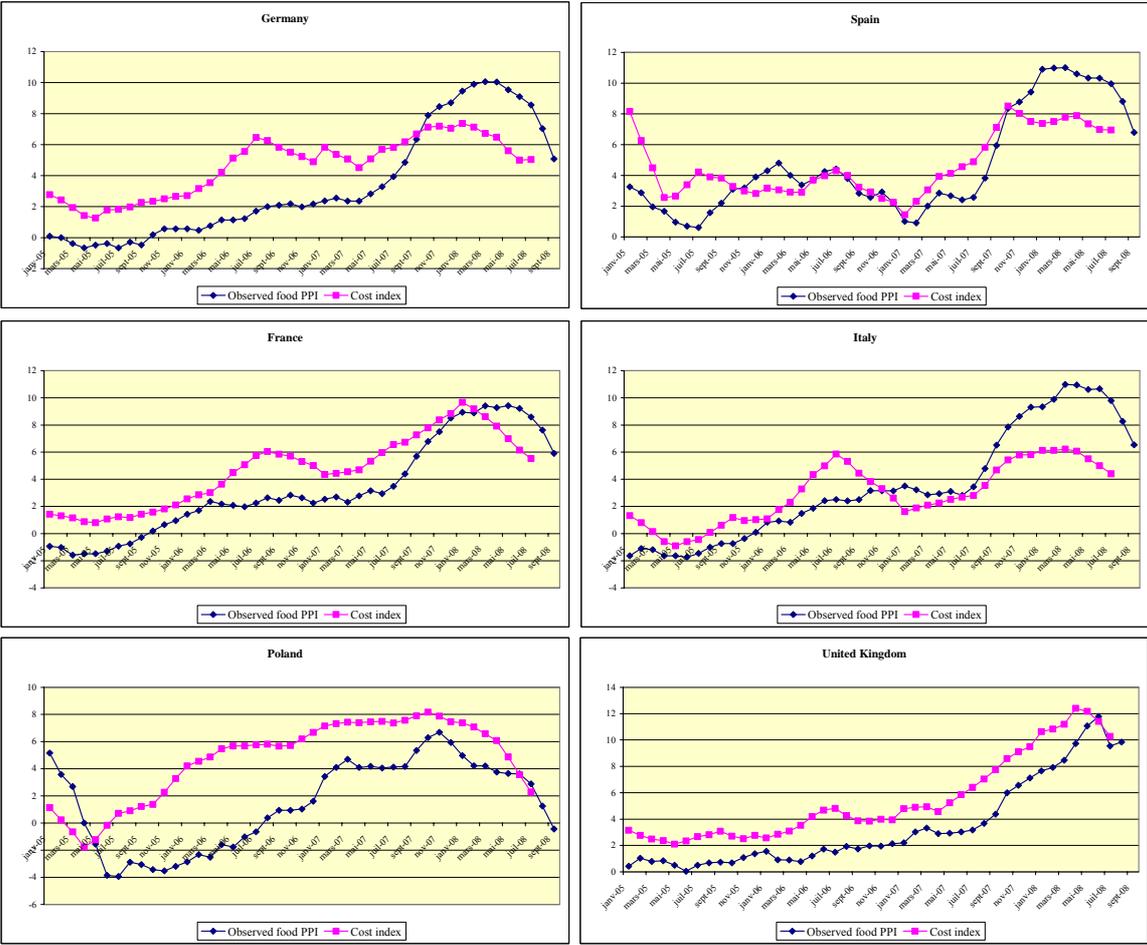


Source: own calculation and sub-aggregations based on ESTAT. Only Member States included where Input/Output tables for 2003 or after are available.

As the cost structure of the food and beverages industry differs quite substantially between Member States (see figure 6), the impact of a change in input prices will be different as well. Factors that play a role include the degree of technological advancement of a country and the composition of its food industry. In the new Member States, the input share of the agricultural sector and the food process industry itself tends to be higher, while in the old Member States the share of business services (including advertising) and compensation of employees is relatively large. The analysis has been carried out at the level of the food and beverages industry as a whole due to data limitations.

Figure 7 compares the evolution of changes in the calculated cost index with changes in the observed producer price index over the period 2005-2008 in the larger EU Member States. In all countries, the rise in input costs was relatively moderate early on but rose to higher levels later within this period before slowing down most recently, suggesting that the order of magnitude of observed price changes is to a large extent justified by changes in the underlying input costs. However, there seem to be differences between countries, which are more apparent when comparing the changes in input costs with the changes in producer prices. While in the UK and, to a lesser extent, in the case of France and Poland, changes in producers prices seem to track changes in input prices, albeit with a small time lag, in the other large EU Member States this seems to be much less the case.

Figure 7: Comparison between changes in the food and beverages producer price index and the production cost index



Source: Own calculations based on ESTAT data

4.2.3. The pass-through from producer to consumer prices

This section considers the pass-through in the downstream segment of the food supply chain. Over the most recent period, a structural break⁷ in the pass-through of changes in producer prices to consumer prices (now measured as an elasticity⁸) was observed in some of the EU countries. In most of the euro area countries, increases in producer food prices started to rise faster than consumer food prices from mid 2007 onwards, whereas the opposite had been true in the period from 2002 to mid-2007 (see figures 8 and 9). This could suggest that the recent producer price increases have not been transmitted fully to consumer food prices. This could

⁷ The structural break was confirmed by Chow test results in the case of Belgium, the Czech Republic, Denmark, Spain, France, Italy, Latvia, Lithuania, Hungary, Poland, Romania, Slovenia and Sweden). Accordingly, the period chosen for the estimation of the pass-through is from January 2002 to June 2007.

⁸ The pass-through is estimated by the application of a simple OLS regression. In order to test the robustness of our estimation results, we introduce the additional estimation results achieved by application of the GMM (Generalised Method of Moments). Individual country single equation regressions were carried out, regressing overall food prices on lagged food producer prices, world food commodity prices, unit labour costs, oil, lagged values of the dependent variables and seasonal dummies.

be an indication that the effects of the increase in producer prices were partially absorbed by the food retail sector through a reduction of profit margins.

Figure 8 Percentage point difference between inflation of consumer and producer prices (January 2002-June 2007)

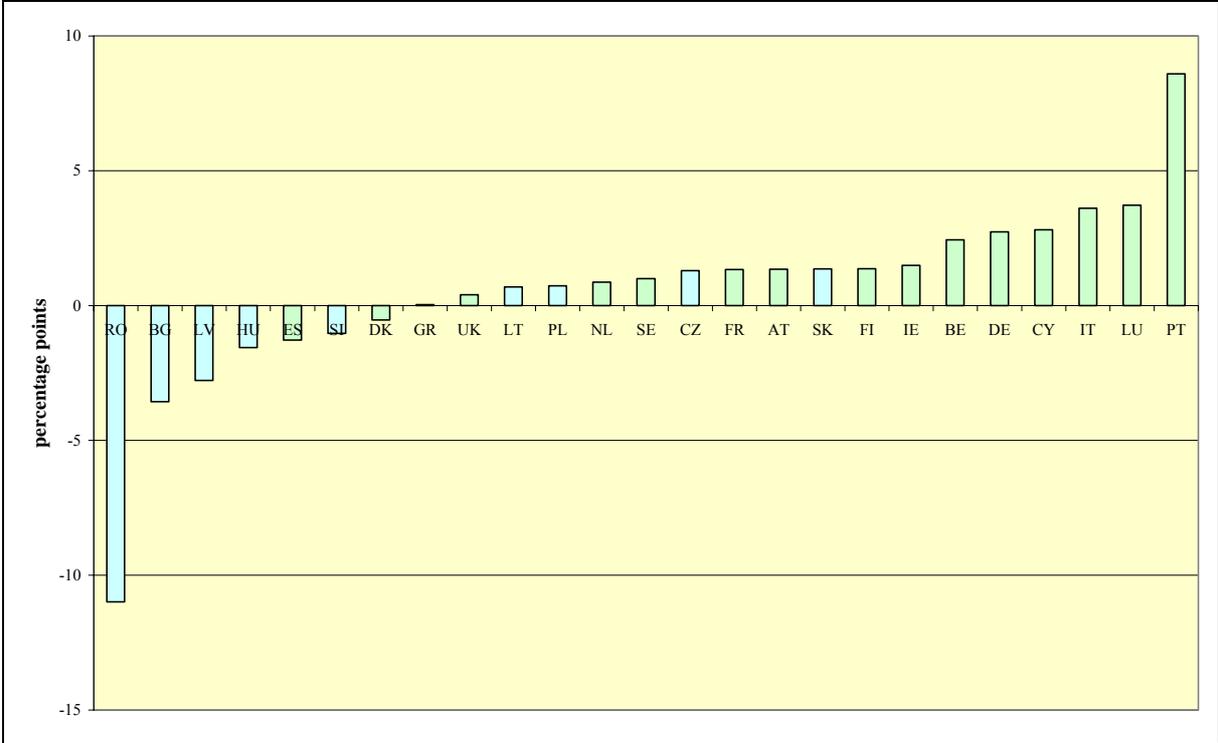
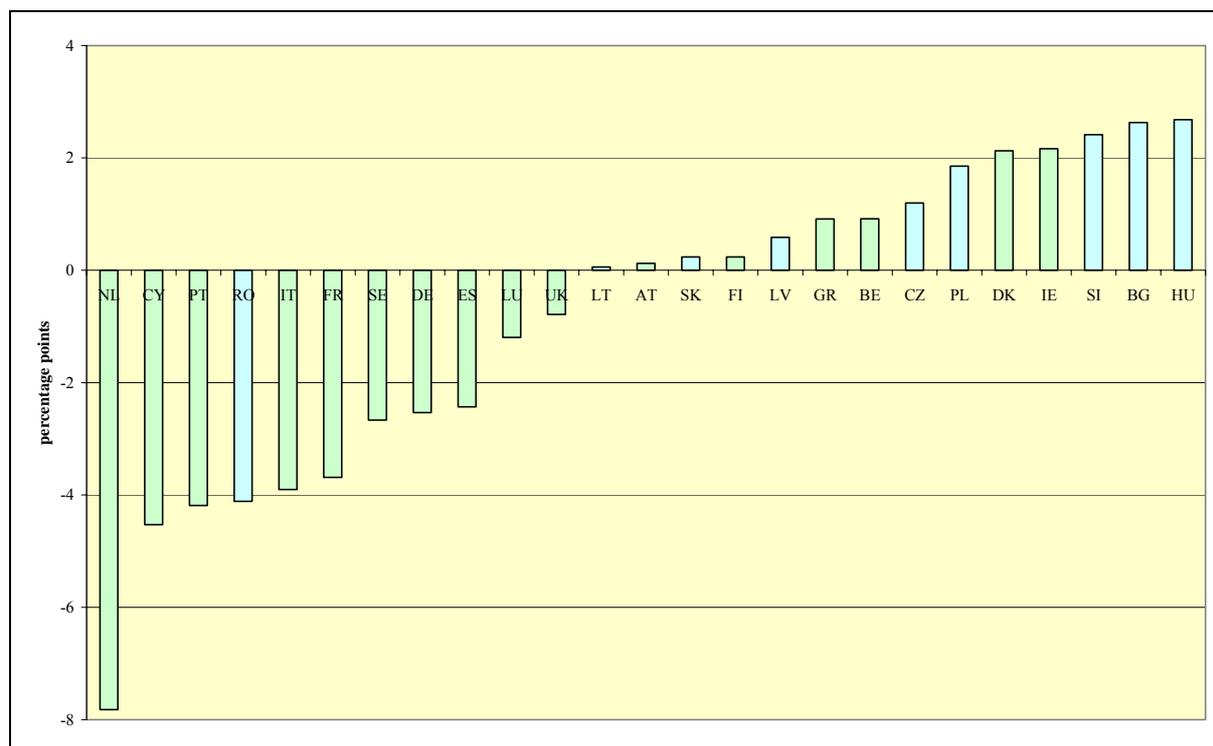


Figure 9: Percentage point difference between inflation of consumer and producer prices (July 2007-July 2008)



A further investigation into the link between consumer and producer food prices reveals a different level and speed of pass-through across the EU countries. The results show that the magnitude of the pass-through of producer prices to consumer prices is relatively large in most of the new Member States when prices go up. In fact, in this case, the elasticity is larger than one suggesting that margins increase. Interestingly, when producer prices decrease, the estimated elasticity is less than one and there are lags (see *Annex 1*). For the euro area, the magnitude of the transmission is similar in the case of price increase and decrease and prices decreases are actually transmitted rapidly. Thus, the results confirm that price stickiness is not an issue in the euro area, whereas there is found evidence of downwards price stickiness in the new Member States. While it is difficult to generalise and these results should be interpreted with care, they suggest that in the euro area retail markets are relatively competitive whereas this seems to be less the case for the new Member States.

Several additional caveats have to be kept in mind when comparing the size of the pass-through and market structure in the new Member States and in the euro area respectively. There are a number of factors which may have contributed to the different trends in the pass-through in the old Member States compared to the new Member States. First, in the new Member States with the lowest price levels, the contribution of (unprocessed) food to the (final) retail price also tends to be greater, which leads to higher percentage increases in the retail prices. In addition, an increase in indirect taxes contributed to the relatively higher consumer food price increases in most of the new Member States. Moreover, energy price increases were stronger in most new EU member states. Given that some food products are highly tradable, food price arbitrage within the EU may have taken place and exerted upward price pressures on food products in the Member States with the lowest price levels. Finally,

the market structure has changed more in the new Member States over the recent period. This aspect is analysed further in the following section.

4.3. The role of the food retail market structure

This section presents the results of an econometric analysis⁹ of the determinants of consumer food price developments (see annex 2). The analysis distinguishes between two groups of countries: new and old Member States. This choice is based on the heterogeneity of these countries as discussed above.

Producer prices explain a high proportion of consumer food price developments in both the old and new Member States in the period from 2003 to 2007. Unit labour costs appear to have a significant impact on consumer food prices in the old Member States only. The reduction in the number of individual retail outlets does not appear to have had an impact on consumer food price development in the old Member States. This suggests that the consolidation of the food retail sector has not led to higher consumer prices in the old Member States. In the case of the new Member States, there seems to be some evidence of a negative link between the number of individual food retail outlets and consumer food prices. Indeed, the number of retail outlets per inhabitant is lower in the new Member States but has increased rapidly. A higher number of alternative outlets at the local level should in principle benefit consumers. A consumer satisfaction survey conducted in the meat and vegetables sectors has shown that still in many new Member States consumers seem to have less possibility to switch between stores.

5. REGULATORY ISSUES

This section discusses the effects of the regulatory framework on competition and prices along the food supply chain. A distinction is made between regulation creating entry barriers, such as planning regimes, regulations restricting shop opening hours and regulations limiting price competition. It is important to bear in mind that these regulations can have an impact on other general policy objectives that must not be overlooked when assessing their overall impact on social welfare and their compatibility with the EU Treaty.

5.1. The effect of the regulatory framework and price levels

The regulatory framework affects the food supply chain at all levels from the agricultural sector down to retail. Regulation may affect the functioning of markets through industry/sector-specific regulation (e.g. urban planning regulations and opening hours in the case of the retail sector) or economy-wide provisions (e.g. labour market regulation, or competition policy). The regulatory framework can raise compliance costs for firms, which will be passed on to customers in the form of higher prices. Regulation can also directly affect prices through price regulation. Another aspect that needs to be taken into account is the level at which the regulatory framework is designed, decided and enforced (i.e. EU-wide, national, regional, local). To the extent that the applicable regulatory framework varies across countries (and even regions), the regulatory impact across the EU is consequently likely to differ as well and may explain some of the observed price differentials.

⁹ The analysis is carried out by the application of a simple OLS regression on pooled annual data.

While an analysis of regulation should take into consideration the costs imposed on firms and ultimately passed on to consumer prices, it should also take into account the regulatory benefits and the contribution of regulation to overall social well-being. For example, planning restrictions or opening hour restrictions are often identified as competition-inhibiting regulations that raise entry barriers for potential entrants and protect incumbents. At the same time they aim to address congestion issues, noise pollution or considerations about the image of town-centres. Therefore, an in-depth examination of the impact of the regulatory framework on the functioning of the food supply chain needs to fully take into account the different objectives of regulations that are imposed on firms and whether those objectives are met in a proportionate manner and in a manner consistent with other general policy objectives.

5.2. Entry regulations

Certain regulations have the effect of potentially hampering competition by constituting significant barriers to entry. Such regulations, which effectively shelter incumbents from potential rivals, occur frequently, notably at the local and/or regional level, and tend to lead to increased margins, higher prices and lower productivity of retailers. This is for example the case for general regulation on commercial establishments, or land and urban planning regulations affecting the attribution of construction permits, which limit the establishment of new stores.

For instance, in some Members States, specific regulations foresee authorisation procedures for shops above a certain size (the threshold being sometimes designed to focus especially on a certain type of commercial format). The procedure can be based on a number of criteria (amongst them criteria of an economic nature, such as the impact of the establishment on competitors or on the “balance” between different forms of shop formats) which give a very large margin of discretion for the authorities delivering the authorisation. The procedure itself is not such to guarantee an objective and impartial application of the relevant criteria. Consequently, these conditions restrict entry to the market.

A survey carried out amongst national competition authorities also suggests that planning regimes place more limited constraints on the extension of existing stores by retailers compared with new entry. An incumbent retailer, by extending its store more easily, will thus make new larger store entry by a rival retailer more difficult.

As indicated in section 6, a consolidation is taking place in the retail sector and this sector is already highly concentrated, especially in the old Member States. This consolidation may under certain conditions give rise to efficiency gains leading to lower consumer prices. Evidence suggests that the presence of several large retail chains appears to contribute to increased price flexibility and greater economies of scale and scope, achieved for example, through lower logistic costs. However, high concentration levels may have a potential negative impact on competition, particularly if entry barriers are high. Therefore, regulations that restrict entry in the medium-term need to be scrutinised with a view to ensuring that incumbents face a constant threat of rapid entry by newcomers. This is being done in the context of the transposition of the services directive and will be further checked in the context

of the retail monitoring report. However, when examining such regulations, their social and environmental objectives must not be overlooked.

5.3. Shop opening hour restrictions

Different regulations restricting opening hours of certain types of retail formats are in place all across Europe and often even vary within Member States. These restrictions may also have a potential negative impact on competition but to a lesser extent than planning regulations, according to the survey made amongst national competition authorities. They may also reduce retailers' efficiency by limiting the possibility to sell their products, and thereby increase operational, logistics and wastage costs of retail outlets. According to some studies relaxing opening hour restrictions could significantly reduce costs.

The most marked differences in shop opening hour regulations relate to Sunday opening. In practice, some Member states do not impose closing days (except a few public holidays such as Christmas day), while others impose Sunday closing or limit the number of Sundays per year that larger shops can open. Furthermore, in some Member States shop opening regulations vary according to regions. For example in one Member State, depending on the region a variation of 6 to 20 Sundays for which opening is allowed exists. In many instances, derogations to Sunday closing are permitted for touristic regions.

Given that Saturdays are key volume sales days for retail stores, it is clear that the risk of having unsold stock in stores at closure is high. As fresh or primary processed food needs to be kept in refrigerators, average costs of storing food in stores with more limited opening hours will be higher and risks of wastage will be greater. Moreover, restrictions of shop opening hours may prevent significant levels of the working population from having access to certain retail stores, which is problematic if the restrictions affect the most price competitive outlets. Nonetheless, the efficiency considerations of lessening restrictions of shop opening hours should be seen in the light of the potential social impact, notably on smaller shops and shop-keepers.

5.4. Regulations restricting the ability to compete on prices

Some regulations contribute to limit price competition between retailers and may create distortions and a lack of transparency in the relationships between suppliers and retailers. Sales below costs restrictions and associated regulations fixing invoice price levels belong to this category. These regulations can be complemented by additional regulations limiting, for example, listing fees (i.e. payments by suppliers to retailers to be granted shelf access) or reverse payments (i.e. fees to be paid by suppliers to retailers for services such as in-store promotions, etc.). The extent of such practices can also be affected by the negotiation power of suppliers and retailers and may under certain circumstances have detrimental effects for competition. In some Member States (e.g. the United Kingdom) some of these commercial practices are addressed by codes of conduct.

In many Member States restrictions of sales below costs are in place through specific regulations prohibiting sales below costs *per se*. These latter regulations aim to establish a certain threshold price under which operators are not allowed to sell except in a limited set of circumstances. Where these regulations exist, the coverage of the prohibition to sell below

costs vary widely across Member States (e.g. application of the prohibition to all retail sectors or only to certain firms or products; circumstances under which a sale below cost would be allowed even if the practise is generally prohibited; elements included in the calculation of "costs", etc).

Such regulations were originally designed to deter predatory behaviour by larger firms to the detriment of smaller market operators, under the hypothesis that the latter would be driven out of the market if their larger competitors could systematically engage in sales below cost. Recent studies were not able to show that the structure of the retail sector was influenced by the existence of such sales-below-cost prohibitions. Therefore, they do not appear to be efficient in protecting small shops which is their primary justification. This is further backed up by national competition enquiries in the Member States where sales below costs are allowed that have concluded that this has not resulted in predatory pricing. Other justifications invoked can be linked to protection of small suppliers (by avoiding excessive pressure on them to lower the purchase price), protection of consumers (which would be attracted in the store by the low price of a given product but would then buy the rest at a higher price), and finally protection of brands (potential devaluation of the value of a brand if the retail price is too low).

In effect, sales-below-cost restrictions set a price floor – often being defined as the invoice price – which amounts to resale price maintenance, limiting intra-brand price competition between retailers. Furthermore, they lead to higher stock-management costs as retailers may face more difficulties in selling excessive stocks. These costs are likely to be higher for perishable products. Regulation defining how this price floor ought to be calculated can also contribute to exacerbate price stickiness. In market segments where food suppliers have considerable market power, these restrictions can lead to the establishment of relatively high price floors. Indeed, there is tentative evidence to show that the imposition of such bans has reduced price competition between major retailers. Food products as necessities are an essential part of the consumer's typical shopping basket and where sales below cost are allowed, retailers can use temporary sales below costs on food products to attract customers from their competitors. Selling below cost may also ease the introduction of new products on the market.

Regulations fixing invoice price levels are often the practical translation of sales below costs restrictions. By stipulating that retailers cannot sell below a pre-defined invoice price, this may strengthen the negotiation power of the strong suppliers. Likewise, the option of compensating higher invoice prices by a reverse margin (i.e. a fee not included on the invoice) may significantly lessen a retailer's incentive to negotiate low prices in the first place. Finally, as negotiations on this price floor are typically national and annual, this tends to lead to differences in prices across national markets and to price stickiness.

However, if sales below costs and invoice price rules were relaxed, there should be sufficient safeguards in order to preserve competition and consumer protection. For instance, it should be ensured that such a relaxation does not result in price wars and predatory pricing. However, this risk can be covered by stringent competition monitoring. Furthermore the accessibility to food retailers for all consumers should be ensured. It should also be warranted that a relaxation of such rules does not affect the development of "qualitative" relationships

between suppliers and retailers in the food chain that encourage investment and innovation throughout the chain.

5.5. Enforcement of consumer protection rules

At a time of sharply fluctuating food prices, the risk of misleading price advertising may increase. For example, consumers may be misled by suppliers altering pack size or contents in order to apparently maintain the same price for the relevant product.

In general, transparency measures allowing better price comparisons across products and stores for consumers, as set down for instance in the Unit Pricing Directive, can facilitate consumer choice. Misleading commercial practices, which distort consumers' behaviour and actions in a way that turns out detrimental to them (e.g. provision of false information or omission of relevant information) are proscribed by the Unfair Commercial Practices Directive. To be effective, both Directives obviously need to be adequately enforced.

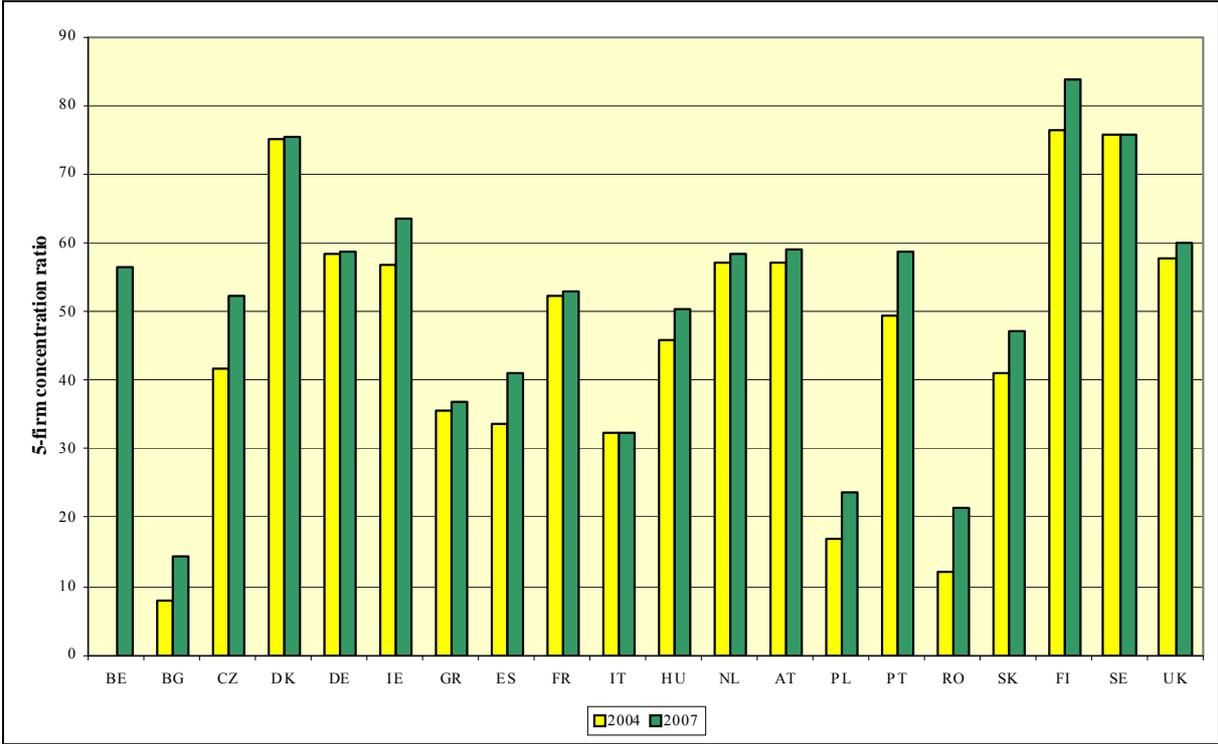
6. THE ROLE OF COMPETITION ALONG THE FOOD SUPPLY CHAIN

The functioning of the food supply chain is also affected by the degree of competition at all stages of the chain. Continuous vigilance is thus required to ensure that competition rules are enforced at EU and Member State level in order to avoid competition infringements such as anticompetitive agreements and practices. This section reviews the role that competition can play for the functioning of the food supply chain. The practices identified in table 2 and described in sections 6.3 and 6.4 constitute the most frequent competition concerns encountered in relation to the food sector at large but they do not constitute an exhaustive list.

6.1. Market structures along the food supply chain

The assessment framework for competition between firms is the relevant market. It is defined according to a product and a geographic dimension at a moment in time. Food retail markets typically involve bundles ("food baskets") sold by individual stores and are local in scope – encompassing a so-called catchment area. In the presence of entry barriers, the competitive constraints faced by a particular retail store thus depend on the presence of other nearby stores. The geographic size of a food retail market also depends on the substitutability of stores from a consumer perspective, which is influenced by the stores' formats and by consumers' valuation of time and travel. Retailer chains themselves act as buyers of food products on a large number of upstream markets. These markets tend to have a much narrower, product-specific, delimitation and are typically much larger in terms of geographic scope – often country-wide or international.

Figure 10: Combined market share of the five largest retailer chains (2007) and change (2004-2007)

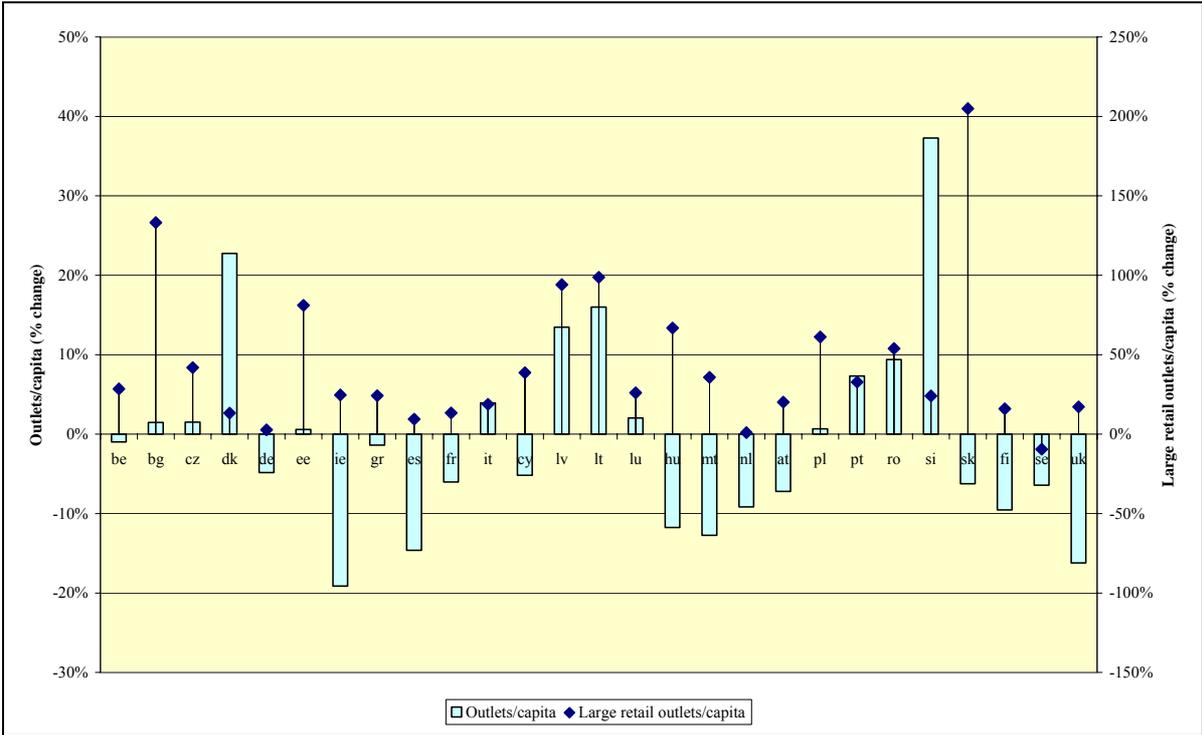


Note: There are no data for CY, EE, LT, LV, LU, MT and SI. Market shares are based on turnover and include non-food items sold by retailers.

Source: Euromonitor International

Following a period of consolidation, the degree of concentration in the EU food retail sector is relatively high – in most Member States the five largest retailer chains account for over 50% of the market (see figure 10). It is higher in the old Member States, but the consolidation movement is stronger in the new Member States. In many of the old Member States this consolidation movement has been accompanied by a switch from smaller to larger store formats and an overall reduction in the number of stores (see figure 11). In contrast the number of individual stores in most new Member States has increased. In all Member States with exception of Sweden food retail surface has increased as has the number of large retail stores (i.e. hypermarkets, supermarkets and discounters).

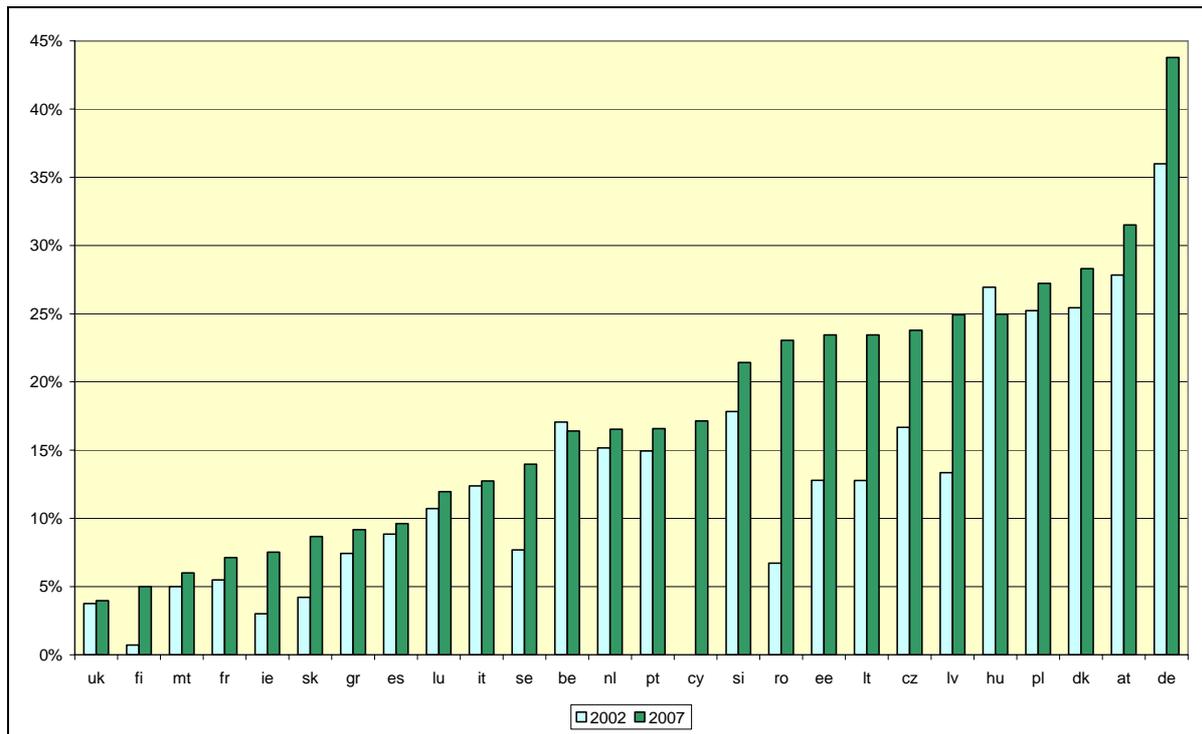
Figure 11: Change in number of outlets per capita, 2002-2007



Note: Large retail outlets include hypermarkets, supermarkets and discounters.
 Source: Euromonitor International

Another trend which may contain prices is the increase in the market share of discounters, who typically focus on low prices at the expense of other product dimensions (see figure 12). Indeed, it is plausible that the presence of discounters exerts pressure on other retailers to increasingly focus on the price dimension. Their growing presence may also have been spurred by changing household purchasing habits and a higher price sensitivity. Over the period 2002-2007, covered in the figure, the share of discounters has increased almost everywhere and in particular so in some of the new Member States (Slovakia, Romania and the Baltic States). With a market share of over 30%, discounters are by far most successful in Germany and Austria, where they have a long-established presence. In the new Member States, discounters are particularly strong in Poland, Hungary and the Baltic States, where they account for a significant market share (over 20%) and continue to grow at a high rate.

Figure 12: Combined market share of retail discounters, 2002 and 2007



Note: Market share calculated as the share of discounters' turnover in turnover of large retailers (hypermarkets, supermarkets and discounters).

Source: Euromonitor International

Even though high concentration levels may *prima facie* be suggestive of weak competition, the size of a retail chain may also allow it to better exploit economies of scale and scope, equipping it in turn to compete more intensely. As indicated above, the presence of more than one retail store in a catchment area is crucial for competition to occur and there do not seem to be any indications that this has been reduced as a result of the consolidation trend in the sector. Furthermore, the market position of a retail chain will condition its market power vis-à-vis suppliers. A potential upstream consequence of consolidation at the retail level is that suppliers are limited in the number of alternative outlets. The fact that many large retailers increasingly operate in more than one Member State and thus have access to wider potential consumer base strengthens their position. Analogously, when concentration occurs in the food industry, retailers themselves face a reduction of alternative sources of supply.

Given the large number and the heterogeneity of food products, the food processing industry needs to be analysed more narrowly on the basis of groups of similar products. As the types of products and characteristics of these groups strongly vary, strong differences are observed in the structure of sub-industries. Market concentration is typically higher in markets for product categories in which brands play an important role. A strong brand may serve as a signal of quality and may contribute to the differentiation of a good, thus helping to secure consumer loyalty. At the same time it may make it harder to compete against, thus dissuading potential rivals from entering and making it difficult for retailers not to carry it (so-called 'must-stock' products). Sectors that are characterised by high concentration and strong brands include biscuits, confectionery and soft drink production. Food products that are less differentiated such as bread, meat or flour are typically produced by food sub-industries that are less

concentrated, including craft production (e.g. bakeries, butcheries). The incidence of private label and no-label products is more widespread in the latter categories. However, the geographic scope of these products is also likely to be narrower.

6.2. The link between competition, price levels and inflation

The more intense the level of competition, the lower price *levels* are likely to be, as firms face competitive constraints that compel them to lower their costs and bring prices down. The effect of competition on price *changes* resulting from increasing input costs is more difficult to assess as on the one hand, firms operating at low margins in competitive markets will be forced to increase output prices and on the other hand, firms in less competitive markets may use the occasion to exploit their market power and raise output prices as well.

Consumer decision-making is based on consumers' characteristics and preferences. The so-called 'retail offers' among which they can choose consist of many dimensions (e.g. quality, range, services, proximity) – the price being just one of them. As a consequence of this, different retailers are likely to focus to a different extent on these respective dimensions. All of these are equally valid dimensions of competition. Even though the focus of this staff working paper is on prices, it is important to recall that retailers compete on 'retail offers' rather than on product price only. Depending on the heterogeneity of consumers' valuation of the different dimensions, prices for similar products are likely to vary substantially across retail chains within the same country, provided that their retail offers are different. To the extent that consumer characteristics and preferences vary across countries and retailers respond to this, it is also likely to observe price differentials across countries.

The analysis of competition can be broken up into horizontal issues (i.e. referring to interactions between actors at the same level of the supply chain) and vertical issues (i.e. referring to interactions between actors at different levels of the supply chain), the two of which are interrelated. The consequences of interactions between firms are situation-specific and consequently need to be assessed in terms of their effect on competition as well as from an efficiency perspective – i.e. in terms of innovative performance, economies of scale and economies of scope, arising for example from lower logistic costs.

The potential and actual effects of both horizontal and vertical agreements between firms are manifold. In some circumstances agreements may indeed result in price levels that are excessive in comparison to the competitive price. The types of practices listed in table 2 may merit a closer scrutiny, always bearing in mind the context in which they take place.

Table 2: Overview of main practices that may give rise to competition concerns

Practice	Description	Main competition risk
Cartels	Agreements among competitors relating inter alia to price fixing, output restriction and market partitioning	Maintenance of high prices and stalling of innovation to the detriment of consumers
Purchasing agreements	Agreements concluded by firms to achieve volumes and discounts similar to their bigger competitors	Under certain conditions, tool for foreclosing rivals' access to essential inputs at competitive conditions; collusive behaviour between competitors on downstream markets
Resale price maintenance	Restriction of the buyer's ability to determine the sale price to end consumers	Reduction of price competition
Single branding	Obligation or incentive scheme which makes the buyer purchase practically all of his requirements on a particular market from only one supplier, for a certain duration	Restriction of in-store inter-brand competition and/or foreclosure of the market to competing and potential suppliers
:		
Tying	Purchase of a product (tying product) made conditional on purchase of other product (tied product)	Foreclosure on the market of tied product, and indirectly of the tying product
Exclusive supply agreements	Direct or indirect obligation causing a supplier to sell a good only to one buyer	Foreclosure of other buyers / retailers
:		
Private label products	Products made by third parties upstream in the supply chain and sold under retailers' brand	Foreclosure of existing and potential competing buyers; restriction of in-store inter-brand competition
Certification schemes	Requirement to comply with a number of conditions set by individual buyers	Risks of foreclosing competing buyers

6.3. Horizontal practices

The functioning of the food supply chain may be affected by a lack of competition in the market. For instance, distortion of competition may arise from operations of concentration leading to dominant positions or anticompetitive unilateral conducts on either the purchasing/procurement markets and on the resale markets for foodstuffs, as well as from agreements between firms or unilateral conducts violating respectively Articles 81 and 82 of the Treaty.

Cartels

Cartels constitute the main anti-competitive behaviour which should always be prohibited. Practices such as price fixing, output restriction or (downstream or upstream) market partitioning, could lead, amongst other effects, to market foreclosure, the artificial maintenance of high prices and a stalling of innovation to the ultimate detriment of European consumers. Recent experience shows that cartels can occur in the food sector. These cartels tend to vary in terms of territorial scope. Special attention should be given by competition authorities to uncovering the most harmful cartels amongst suppliers of both processed and non-processed foods.

Purchasing agreements

Other horizontal agreements, such as joint purchasing agreements ("buying alliances") among several large retailers should also be scrutinised.¹⁰ These purchasing agreements are often concluded by small and medium-sized retailers and wholesalers to achieve volumes and discounts similar to their bigger competitors. These agreements between SMEs are therefore normally pro-competitive since even if a moderate degree of market power is created, this may be outweighed by efficiency gains resulting from economies of scale. The size and number of buying alliances in the food sector has grown considerably throughout the EU. The involvement of larger buyers in such alliances has led to increasing concerns expressed by producers of both processed and unprocessed food, as well as farmers. The impact of this kind of agreements on the functioning of the food supply chain needs to be closely followed since such agreements may serve as a tool for foreclosing rivals' access to essential inputs at competitive conditions and/or for competitors to engage in collusive behaviour on downstream markets (i.e. price fixing, output limitation or market allocation). The Guidelines on the applicability of Article 81 of the EC Treaty to horizontal cooperation agreements, as well as the Guidelines on vertical restraints, provide the right analytical framework to address joint buying from a competition policy perspective. The Commission and National Competition Authorities will continue to use these tools to carry out the relevant analysis.

Mergers

Concentration at all levels of the food supply chain shall be continuously monitored. Through rigorous merger control mechanisms, which include the obligation for all companies involved to notify proposed structural operations to the Commission or National Competition Authorities, European competition rules ensure that the increased concentration resulting from mergers does not significantly impede effective competition at any level of the food supply chain. Among the mergers with a so-called 'Community dimension'¹¹ analysed by the European Commission since 2000 in sectors relating to the food supply chain, the large majority was unconditionally approved, indicating that they did not give rise to impediments to competition. Only a small number was approved subject to conditions. This distribution is fairly consistent with merger decisions in other sectors of the economy¹², suggesting that mergers in sectors along the food supply do *a priori* not give rise to higher anti-competitive risks than those in other sectors of the economy.

6.4. Vertical issues

The degree of market power held by the firms in vertically-related markets varies by product category and can potentially lead to imbalances in the food supply chain. It is influenced inter alia by the position of firms in the markets in which they operate, be it as suppliers or as

¹⁰ The Guidelines on the applicability of Article 81 of the EC Treaty to horizontal cooperation agreements, as well as the Guidelines on vertical restraints, provide the right analytical framework to address joint buying from a competition policy perspective.

¹¹ Council Regulation (EC) No 139/2004 of 20.01.2004 on the control of concentrations between undertakings. A 'Community dimension' exists where the merging parties have an aggregate Community-wide turnover exceeding a certain threshold, of which two-thirds at most are achieved in one and the same Member State.

¹² <http://ec.europa.eu/comm/competition/mergers/statistics.pdf>

buyers. Consolidation in a sector may allow firms to countervail market or buyer power in a vertically-related market, but may also result in foreclosure. The ongoing consolidation in both the retail sector and the food industry can generate efficiency gains and does not necessarily constitute a competitive risk, to the extent that it counteracts upstream market power or buyer power respectively. Nonetheless, excessive concentration may ultimately result in anti-competitive developments leading to price increases. For this reason the developments in the sectors along the food supply chain and the behaviour of market participants need to be monitored closely to pre-empt anti-competitive situations that would ultimately fuel price increases. A number of features other than the market share of firms involved in a vertical transaction may affect their bargaining power or already be a reflection of it. These features include product attributes, for example the relative importance of branded products, as well as contractual terms between vertically-related firms. These features are by and large legitimate activities, but deserve consideration in any deeper assessment of the food supply chain.

The effects of vertical agreements on prices are ambiguous and may either foster competition by generating efficiency gains, or inhibit it by leading to vertical foreclosure or by facilitating collusion on any level of the supply chain. Besides resale price maintenance and some practices relating to market partitioning, which are considered hard-core restrictions of competition, a large number of vertical agreements (including exclusive distribution, single branding, tying, exclusive customer allocation, selective distribution, franchising, exclusive supply agreements and recommended and maximum resale prices) can be identified which, given their ambiguity, typically require a case-by-case assessment, for which detailed rules exist at Community level.¹³

Resale price maintenance

Practices relating to resale price maintenance are considered hard-core restrictions on competition. Such practices restricts the buyer's (i.e. the wholesaler or retailer's) ability to determine the price level at which he will sell the product to his customers. As a result, price competition in the downstream market is significantly reduced. Practices relating to resale price maintenance often appear local in scope National Competition Authorities are also well equipped to address them.

Single branding (and tying)

Other vertical agreements such as single branding could also have detrimental effects on consumers. Single branding involves an obligation or an incentive scheme which makes the buyer purchase practically all of his requirements on a particular market from only one supplier. As a result, the buyer will not buy and resell competing goods. This may lead to foreclosure of the market to competing and potential suppliers or a loss of in-store inter-brand competition. The market position of the supplier is of importance since it is only likely that competing suppliers are foreclosed if they are significantly smaller than the supplier applying the non-compete obligation. In the food sector, single branding, including direct or indirect practices that result in brand exclusivity, requires a case-by-case analysis to determine the

¹³ Regulation 2790/1999 on the application of the Article 81(3) to categories of vertical agreements and concerted practices, and Guidelines on vertical restraints 2000/C 291/01

potential detrimental effect on the food supply chain. The Commission's Block Exemption Regulation¹⁴ and the Guidelines on vertical restraints provide detailed rules for such assessment. Other business practices such as tying the purchase of a product to that of another product may also result in brand exclusivity and consequently have similar effects requiring further analysis to determine their potential detrimental effects on the food supply chain.

Exclusive supply agreements

Exclusive supply agreements may also require careful scrutiny. Exclusive supply relates to any direct or indirect obligation causing the supplier to sell the goods specified in the agreement only to one buyer inside the Community for the purposes of a specific use or for resale. The main competition risk in this situation is foreclosure of other buyers/retailers within the food supply chain. The market position of competing buyers on the upstream market is thus crucial since competitors are only likely to be foreclosed if their market position is significantly smaller than that of the buyer benefiting from the agreement. If the buyer has market power downstream, appreciable negative effects for consumers can be expected. However, countervailing power of suppliers is also of relevance, since important suppliers will not easily allow themselves to be cut off from alternative buyers.

Certification schemes

Certification schemes can be mentioned as an example of arrangements that could indirectly compel the suppliers to sell to only one buyer. Certification schemes required by retailers often involve a significant financial and administrative burden for farmers and food producers. The functioning of these schemes in the EU market needs to be scrutinised with a view toward reducing their costs and removing barriers to market access and integration. Recent years have indeed seen a substantial growth in private and national food quality certification schemes. These schemes may be useful for producers and consumers, as they guarantee quality and origin and therefore allow customers to make better informed choices. Furthermore, as many of these schemes are related to environmental standards their aim is to halt environmental degradation and to add to food security in the long-term, for example by promoting sustainable farming practices. Nonetheless, the proliferation of schemes and labels in recent years has given rise to concerns about their transparency requirements, the credibility of the claims made and their possible effects on equitable commercial relations. In particular, the pressure to participate in more than one scheme because of different customer requirements entails a significant financial and administrative burden for agricultural producers, and especially small-scale producers. There is thus a need to analyse to which extent certification schemes act as barriers to market access and to the free movement of goods, thereby impeding the smooth functioning of the Single Market. The Commission has opened a debate on the various aspects of agricultural product quality policy, including certification schemes and their functioning in the EU market.¹⁵ Building on these reflections the Commission will develop strategic orientations in a Communication on agricultural product quality policy scheduled for spring 2009.

¹⁴ Guidelines on vertical restraints 2000/C 291/01

¹⁵ COM(2008) 641 final, 15.10.2008, Green Paper on Agricultural Product Quality.

Private labelling

The introduction of private label products by retailers is a growing trend in the food retail sector. The market share of such products varies by country, product-category and store format. In some Member States they now account for more than 40% of products sold. For many store formats – in particular discounters – private labels represent the quasi-totality of listed products. While they widen the range of available products and thus represent an additional source of competition, they may lead to foreclosure effects as supplier of branded products become a direct competitor to the retailer. Similarly, while private label products provide opportunities for their producers to have access to a large customer base, they may also reinforce their dependency towards a particular retailer. Their long-term impact on prices is ambiguous, but there is nonetheless some evidence that they exert a downward impact on the price level of a given product category, which is particularly strong upon their introduction. Nonetheless the effect of private label products on buyer power and on innovation in the food industry will continue to deserve attention.

The increased bargaining power of retailers resulting from the introduction of private label products may be offset by the strong bargaining power of firms offering (internationally) branded products due to the 'must-have' status of such products. Producers of homogeneous products, for which brand awareness is not high, are likely to be in a much weaker position. A stronger brand image results from product differentiation through investment in product innovation, quality and advertising. Ultimately strong brands may constitute entry barriers, as new entrants would be faced with high levels of upfront costs they could not recover subsequently (endogenous sunk costs).

7. CONCLUSION

This working document has provided a brief description of the food supply chain and has investigated the impact of the conditions of competition and of the regulatory framework on the functioning of food markets in general and food price and inflation levels in particular. With food prices forecast to remain firm in the coming years, every effort should be made to improve the efficiency of Europe's food supply chain and to overcome its still existing fragmentation. This could provide relief to European households in a context of low economic growth and rising unemployment.

The document has shown that the sectors belonging to the food supply chain, in particular the food processing industry and the distribution sectors are economically important and have many interactions with other sectors of the economy, either as purchasers or as suppliers of intermediate inputs. The slow productivity growth in these sectors indicates that there is room for improving the efficiency of the food supply chain.

In this context, this document has examined how the degree of competition in the food industry and the downstream retail markets may have affected price developments. It identifies a number of factors and practices – notably behaviours lessening the degree of competition and unnecessary regulations – that may lead to higher price levels and explain the observed variation across Member States. While it finds that price increases on specific

products in certain markets may well be the result of anti-competitive behaviour by a firm or a group of firms, it does not suggest that a direct causality link exists between the recent across-the-board food inflation and competition along the food supply chain in Europe.

The food supply chain is going through a process of consolidation in both food processing and distribution. While consolidation, when it reaches certain levels in specific markets, could constitute a competitive risk, it often generates efficiency gains and cost reductions also. According to the preliminary findings presented in this paper, no general conclusion can be drawn that the ongoing market consolidation in food retailing has raised consumer food prices levels in the old Member States. In the new Member States, the consolidation goes hand in hand with a higher and faster transmission of consumer price increase. But the simultaneous increase in the number of retail outlets appears to have limited the increases in consumer food prices caused by the higher producer prices to some extent. A competitive framework, supported by vigilant competition authorities and a regulatory framework that does not unnecessarily hamper market entry should continue to ensure that the food supply chain delivers benefits to consumers.

Annex 1:

Consider a simple OLS regression of the form:

$$\Delta CP_t = \alpha + \beta \Delta P_t + \varepsilon_t$$

$$\text{with } \beta = \begin{cases} \beta^+ & \text{if } \Delta P_t \geq 0 \\ \beta^- & \text{if } \Delta P_t < 0 \end{cases}$$

where ΔCP is a change of the consumer food prices, ΔP is a change of the producer prices and ε is an error term. The reaction of the consumer prices is symmetric to increases and decreases in P if

$$\Delta\beta := \beta^+ - \beta^- \approx 0$$

The estimates of β (and hence of $\Delta\beta$) may be biased if the entire reaction of consumer food prices to changes in producer prices is delayed. In order to account for this possibility a regression with three lags can be estimated:

$$\Delta CP_t = \alpha + \beta_1 \Delta P_{t-1} + \beta_2 \Delta P_{t-2} + \beta_3 \Delta P_{t-3} + \varepsilon_t$$

$$\text{with } \beta_i = \begin{cases} \beta_i^+ & \text{if } \Delta P_{t-i} \geq 0 \\ \beta_i^- & \text{if } \Delta P_{t-i} < 0 \end{cases} \text{ for } i=1,2..6.$$

According to the Wald test, the difference of the coefficients $\beta^+=1.09$ (instant reaction) $\beta^- =0.89$ (3 lags) is significant at 1% test level in the case of the new Member States. Thus, the results show that the magnitude of the pass-through of producer prices to consumer prices is relatively large in most of the new Member States when prices go up. In fact, in this case, the elasticity is larger than one suggesting that margins increase. Interestingly, when producer prices decrease, the estimated elasticity is less than one and there are lags.

Table A1: Price stickiness: Transmission of producer price decreases and increases into consumer prices in the new Member States

Dependent Variable:	Consumer food prices increases				
Estimation sample	2005 January - 2008 August				
Explanatory variables		producer price decreases (-3 lag)	producer price increases (instant reaction)	R-squared	Adjusted R-squared
	Coefficient	0,85**	1,08***	0,53	0,50
	Std. Error	0,42	0,18		
	t-Statistic	2,04	5,99		

(***) - indicates significance at 1% test level.

(**) - indicates significance at 5% test level.

(*) - indicates significance at 10% test level.

Table A2: Transmission of producer price decreases and increases into consumer prices in the euro area

Dependent Variable:	Consumer food prices increases					
Estimation sample	2005 January - 2008 August					
Explanatory variables	producer price decreases (instant reaction)	producer price increases (-1 lag)	producer price increases (-3 lag)	R-squared	Adjusted R-squared	
Coefficient	0,95***	0,48***	0,47***	0,40	0,36	
Std. Error	0,29	0,18	0,18			
t-Statistic	3,31	2,65	2,59			

(***) - indicates significance at 1% test level.

(**) - indicates significance at 5% test level.

(*) - indicates significance at 10% test level.

Annex 2:

Table 1: Results of the pooled data analysis

Dependent Variable:	Consumer food price increases					
Estimation sample	2003 - 2007					
Explanatory variables		Producer food prices increases	Unit labour costs increases	The increase in number of outlets per person	R-squared	Adjusted R-squared
Old member states	Coefficient	0,20***	0,45***	-	0,56	0,51
	Std. Error	0,06	0,11			
	t-Statistic	3,40	3,97			
New EU member states	Coefficient	0,91***	-	-0,32***	0,82	0,81
	Std. Error	0,10		0,08		
	t-Statistic	9,83		-3,88		

(***) - indicates significance at 1% test level.

Note 1) The analysis is carried out by the application of a simple OLS regression on pooled annual data

Note 2) The new EU member states pool includes: the Czech Republic, Latvia, Lithuania, Hungary, Poland, Slovenia. The rest of the countries are not included due to missing food market structure or food producer price data.