

E.CA Economics

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## Cross-country price comparisons for competitive assessment

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### Methodological remarks

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# 1 Introduction and executive summary

Over the course of the last years, the European Commission and national competition authorities are increasingly scrutinising competition, commercial and trading practices in the food supply chain. The authorities are concerned about various alleged unfair trading practices that might cause consumer harm. The activities in the food supply chain are to a large extent driven by the common perception of high and volatile prices, lack of transparency, comparability and price transmission in the food supply chain as well as the fact that recently inflation of food prices was higher than non-food price inflation.

Against this background, this brief focuses on a relatively narrow methodological issue of proper measurement of retail food prices. While measuring prices of individual products seems a relatively simple task from a methodological point of view (although its practical implementation can be also very resource intensive), the discussion often evolves to cover much broader categories such as “food products” in general, which necessarily involves some aggregation of the underlying disaggregated raw data. It is the potential distortions caused by the aggregation process and their implications for usage of such aggregated indicators in the context of competition policy that are the main topic of this paper.

Many average food price levels and indices, e.g. these collected and provided by Eurostat, are prepared with a primary goal different than competition assessment, i.e. to measure inflation or purchasing power parities across countries. These prices present aggregates, which in no way reflect markets in the competition sense. In particular, product market definitions in the competition context are usually narrower than very broad food categories reported by Eurostat. This is because, generally, even a single category contains very different products that are not demand substitutes for each other. Moreover, geographic scope of the retail markets is generally local, while the prices statistics are produced at the national level. Accordingly those average food price levels and indices perform poorly to assess relative competitiveness of food supply chains in different countries.

In particular, we analyse methodologies underlying three different sets of prices published by Eurostat and come to the following conclusions:

**Harmonised indices of consumer prices (HICPs)<sup>1</sup>** are not suitable for cross-country price comparisons for a number of reasons. First and most importantly, there are differences in product definitions which imply that data on different products is collected in different countries. Second, there are many substantial differences between the products that are selected due to differences in the sampling approaches adopted by the national statistical institutes. Also, the products for which prices are observed are not necessarily the most representative products in the market. This applies both to EU-wide as well as national HICPs programmes. Eurostat in its technical publications is aware of these technical limitations of the HICPs they produce with ongoing efforts to improve the overall quality of HICPs.

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<sup>1</sup>The harmonised index of consumer prices, abbreviated as HICP, is the consumer price index as it is calculated in the European Union (EU), according to a harmonised approach and a single set of definitions. It is mainly used to measure inflation. Source: [http://epp.eurostat.ec.europa.eu/statistics\\_explained/index.php/Glossary:Harmonised\\_index\\_of\\_consumer\\_prices\\_\(HICP\)](http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:Harmonised_index_of_consumer_prices_(HICP))

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**Price Level Indices (PLIs)** are explicitly created to serve as indicators of price level differences across countries.<sup>2</sup>The raw data for PLIs is collected in a similar way as for HICPs, although in separate surveys and according to different sets of product definitions. PLIs are obtained by comparing price levels for a basket of comparable goods and services that are selected to be representative of consumption patterns in the various countries. However, at the fundamental level, they suffer from the similar problems as HICPs although to a lesser extent:

- PLIs are available only for very broad product categories. They are much broader than relevant product markets typically defined in competition context. It is the level of prices in these (proper relevant antitrust) markets that are relevant for competitive assessment, not very broad concepts such as “food prices” described by PLIs.
- For differentiated products differences in observed prices (across countries and over time) can be potentially explained by differences in the (unobserved) product quality. There is a fundamental trade-off between the level of detail in product specification (which includes quality) and obtained coverage. Narrow definitions increase comparability of different products across countries, but also reduce the scope of the market covered by the sampling exercise and thus would reduce the representativeness of the collected data set. Representativeness is likely to be more important for inflation measurement than for competitive assessment.
- Prices observed by the price collectors are those of product-offers, i.e. the price observer collects the price at which a product is offered in an outlet. This means that short-term consumer responses to changing market circumstances do not influence the resulting average price. They do not take the volume effect of sales promotions into account and do not reflect the short term consumption patterns.

The **Detailed Average Prices (DAPs)** project was developed with an explicit intent to address the need for more detailed price level data.<sup>3</sup> It is constructed using a reduced version of the standard product definitions used also for the purchasing power parities (PPPs). Product definitions used are more precise than these used for PLIs. However, because of data issues the product coverage of DAPs project is currently very limited and definitely not representative. For products for which data is available, it should nevertheless be considered more accurate than using PLIs.

Another potential source of price data that could be used for cross-country price comparisons is scanner data, e.g. as collected by data providers like Nielsen or IRI.

**Scanner data** is collected at the highest possible level of disaggregation. This leads to very narrow categories of essentially homogeneous products (as defined by a stock keeping unit, (SKU)). On the other hand, the coverage of the data set is also limited, as not all SKUs are offered in multiple countries and only products with the same SKU can be taken into consideration for analysis.

Competition authorities are familiar with scanner data. This type of data is routinely requested and used in competition enforcement, e.g. to inform merger assessment. Given its advantages over data collected in surveys (such as higher level of disaggregation, higher frequency of collection, based on

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<sup>2</sup>The price level index, abbreviated as PLI, expresses the price level of a given country relative to another (or relative to a group of countries like the European Union), by dividing the Purchasing power parities (PPPs) by the current nominal exchange rate. Source: [http://epp.eurostat.ec.europa.eu/statistics\\_explained/index.php/Glossary:Price\\_level\\_index\\_\(PLI\)](http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:Price_level_index_(PLI))

<sup>3</sup> See: [http://epp.eurostat.ec.europa.eu/portal/page/portal/hicp/documents\\_meth/PDMM/Consumer\\_Prices\\_Research\\_2013.pdf](http://epp.eurostat.ec.europa.eu/portal/page/portal/hicp/documents_meth/PDMM/Consumer_Prices_Research_2013.pdf)

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actual transactions and not only offers, and link between price and sales volume data), this seems to be the preferred source of data to inform policy decisions related to a competitive assessment.

In the second part of the report, we illustrate the practical relevance of the various methodological issues discussed by some simple analysis of actual price data from publically available Eurostat sources as well as high quality Nielsen scanner data. The analysis of actual food price levels supports the following observations:

- At the most aggregated level, food price level in Germany meet different European averages. Thus, judging by the price level alone, this indicates that the retail food markets in Germany are on average as competitive as retail food markets elsewhere in Europe. This result is potentially affected by the methodological issues discussed before though.
- All data sources analysed are consistent in showing that at the more disaggregated level for food categories for which product quality differences are relatively unimportant (products are relatively homogenous) or can be properly controlled for (branded products) prices in Germany on average are actually lower than in many other European countries, in particular other EU-15 countries.
- Survey data suggest that price level in Germany might be slightly higher for food product categories for which product quality is important but difficult to measure, such as meat, fish or fresh fruit. There are a number of plausible theoretical explanations for the observed differences in prices, including differences in product quality, differences in underlying cost structure or other factors (e.g. outlet distribution). These product categories are underrepresented in the SKU scanner data, so they cannot be analysed using that data and methodology.

Price measurement problems can be further addressed in the future by refining and improving the European Food Prices Monitoring Tool and increasing coordination and cooperation between various national price observatories and other initiatives as well as better understanding how different, non-price factors affect the economic dynamics and outcomes in the food supply sector in Europe.



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## 2 Competition policy and the food supply chain

There are a large number of recent or ongoing activities including market enforcement actions such as merger control and cartel cases as well as numerous market monitoring actions, such as sector inquiries conducted or ongoing for various specific food product markets and by different national competition authorities. The focus on the food supply chain by national competition authorities in the EU is very likely to continue. It shows that the food supply chain is a high priority for antitrust enforcement and that EU regulators closely monitor the activities of companies in the food supply chain.

Over the course of the last years, the European Commission and national competition authorities are increasingly scrutinising competition, commercial and trading practices in the food supply chain.<sup>4</sup> The authorities are concerned about various alleged unfair trading practices that might cause consumer harm.<sup>5</sup> However, the European Commission did not propose regulatory action at EU-level in its recent Communication on unfair practices in the food supply chain (COM (2014) 472 final, 15<sup>th</sup> July 2014) but supported the voluntary Supply Chain Initiative ([www.supplychaininitiative.eu](http://www.supplychaininitiative.eu)) an important cornerstone for fair and sustainable commercial relationships.

The activities in the food supply chain are to a large extent driven by the common perception of high and volatile prices, lack of transparency, comparability and price transmission in the food supply chain as well as the fact that recently inflation of food prices was higher than non-food price inflation. Food prices are a highly sensitive topic because a substantial fraction of income is spent on food (although in the long run household share of food expenditures shows a declining trend).<sup>6</sup> Moreover, food expenditure as a share of overall household expenditures is negatively correlated with income so that population groups with low income generally spend a substantial proportion of their income on food. Thus the increase in food prices is felt mostly by people who are generally less well-off. This makes high food prices a highly political topic. Nevertheless, the European Commission showed in its study “The economic impact of modern retail on choice and innovation”, 2<sup>nd</sup> October 2014,<sup>7</sup> that retailers’ bargaining power does not seem to have a negative impact on choice and innovation.

Basic upstream agricultural inputs are commodities and their prices are highly and inherently volatile. In particular, recent episode of high volatility in agricultural commodity prices is not unusual and not unprecedented.<sup>8</sup> When high commodity prices get transmitted to final prices it creates pressure on politicians to “do something”. Because high prices are often associated with poorly functioning

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<sup>4</sup> See e.g. report on competition law enforcement and market monitoring activities by European competition authorities in the food sector (24 May 2012) drafted by the European Competition Network food subgroup, available online at: [http://ec.europa.eu/competition/ecn/food\\_report\\_en.pdf](http://ec.europa.eu/competition/ecn/food_report_en.pdf). The report lists more than 180 recent and ongoing antitrust enforcement cases in the food sector and over 100 market monitoring cases in Europe.

<sup>5</sup> See e.g. green paper on unfair trading practices in the business-to-business food and non-food supply chain in Europe (31 January 2013), available online at: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52013DC0037&from=EN>

<sup>6</sup> According to Eurostat, in 2012 final consumption expenditure of households of food and non-alcoholic beverages as a percentage of total expenditure averaged 13.0% in 28 EU countries ranging from 8.3% in Luxembourg to 19.2% in Latvia. Source: <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tsdpc520>

<sup>7</sup> <http://ec.europa.eu/competition/publications/KD0214955ENN.pdf>

<sup>8</sup> It is generally considered that supply is highly inelastic in the short term, which results in substantial price movements in responses to changes in demand.

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competition, the pressure is also on competition authorities to act. This led to numerous initiatives, such as creation of the High Level Group on the Competitiveness of the Agro-Food Industry,<sup>9</sup> Forum for a Better Functioning Food Supply Chain,<sup>10</sup> High Level Group on Retail Competitiveness<sup>11</sup>, creation of the European Food Prices Monitoring Tool,<sup>12</sup> to mention only some of the latest and most prominent initiatives at the European Commission level.

However, low level of competition is just one of potential factors that could explain high food level prices. Many other factors, such as technological changes and progress, evolving consumer tastes and preferences, regulatory actions, differences in tax regimes across countries and over time, etc. can have substantial impact on the functioning of the food supply chain and the level of retail food prices. So while weak competition generally leads to high prices, high prices on their own do not necessarily imply lack of competition. Similarly, while high variation in prices can be uncomfortable for the consumers, the rapid movements in prices can show that markets are competitive as they are quickly adjusting to changes in supply or demand.

Additionally, high prices are only a single possible symptom of poorly functioning competition and more comprehensive analysis needs to take into account other even more relevant factors. In particular, differences in observed prices (across countries and over time) can be potentially explained by differences in underlying costs. For that reason, for competitive assessment profit margins generally must be considered to be more relevant than just prices.<sup>13</sup>

Competition problems can also potentially affect different stages of the food supply chain. Recent OECD paper<sup>14</sup> states that anticompetitive behaviour at the level of farms is uncommon. The major concern at the other end of the supply chain is significant buyer power of retail chains. This can put pressure on suppliers to lower their prices. However, this need not necessarily be a competition problem, and can be even beneficial to consumers, in particular if the lower prices are passed on to final consumers because the chains compete aggressively with each other in the local markets. The OECD paper concludes the most prevalent form of anti-competitive conduct occurs in the intermediate stages of the supply chain, the food processing stage, and in particular if a relatively small number of food processing enterprises deals with a large number of farms and wholesalers or retailers. The OECD report also emphasises that national and local regulations also have the potential to distort and reduce competition, perhaps more so than private anti-competitive conduct.

It is not only the comparisons of prices over time (price trends) that might be a reason for concerns, but also comparison of prices across different geographies. Cross-country price comparisons can be - and often are - even more informative to draw inferences about the relative level of functioning competition across different countries. Very broadly speaking, all other things equal, the lower the observed level of prices, better functioning of competition in the market can be expected. Conversely, relatively high levels of prices can be indicative of potential problems in functioning of the competitive markets. However, differences in prices across geographic markets can be affected not only by the differences in the intensity of competitive interactions, but also by other factors, such as level of costs,

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<sup>9</sup> [http://ec.europa.eu/enterprise/sectors/food/competitiveness/high-level-group/index\\_en.htm](http://ec.europa.eu/enterprise/sectors/food/competitiveness/high-level-group/index_en.htm)

<sup>10</sup> [http://ec.europa.eu/enterprise/sectors/food/competitiveness/forum\\_food/index\\_en.htm](http://ec.europa.eu/enterprise/sectors/food/competitiveness/forum_food/index_en.htm)

<sup>11</sup> <http://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetail&groupID=2970&Lang=DE>

<sup>12</sup> [http://ec.europa.eu/enterprise/sectors/food/competitiveness/prices\\_monitoring\\_en.htm](http://ec.europa.eu/enterprise/sectors/food/competitiveness/prices_monitoring_en.htm)

<sup>13</sup> Comparison of profit margins is likely to be plagued by its own methodological problems. In particular accounting costs can poorly reflect economic costs (including the opportunity costs).

<sup>14</sup> Competition and Commodity Price Volatility (2012), OECD, available online at:

<http://www.oecd.org/daf/competition/CompetitionAndCommodityPriceVolatility2012.pdf>

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product heterogeneity (quality differences), taste differences related e.g. to income effects or systems and levels of taxation. If the differences in such other factors are not properly accounted for or misinterpreted, cross-country price comparisons can lead to misleading inferences about the relative levels of competition.

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### 3 Evaluation of methodologies

Many publically available average food price levels and indices, e.g. these collected and provided by Eurostat, are prepared with a primary goal different than competition assessment. “Average food prices” prepared primarily to measure inflation or purchasing power parities across countries can perform poorly to assess relative competitiveness of different national markets.

The European Commission staff working document “Improving price transparency along the food supply chain for consumers and policy makers” acknowledged some of the problems with currently available price comparison data, but did not sufficiently address these methodological challenges.<sup>15</sup>In particular, the price indices available through the Eurostat Consumer Prices Research or European Food Price Monitoring Tool are inadequate to accurately measure and compare prices across different markets for the purposes of competition policy.

All statistics, and in particular simple summary statistics such as “average food prices”, are necessarily a gross simplification of a very complicated reality. Statistics are created by statisticians to simplify the complexity of the real world and allow its interpretation as numbers that can be easily understood; they do not exist independently of that reality. Some statistics can simplify the reality in a way that significantly distorts the reality in some way and their interpretation can lead to misleading conclusions. No statistic is perfect (they all simplify reality to an extent), but some are less imperfect than others; the best ones minimise the distortion.

The process of creation of every statistic necessarily involves some choices that affect the resulting numbers and in consequence also affect what we understand about the reality and how we can interpret the numbers. Statisticians must choose definitions (define what they want to measure) and they must decide on methods (how they want to measure it). Every statistic reflects its creator’s choices. Being aware of these choices often is crucial to understanding possible distortions of reality introduced by the definition and the methodology.

There are a number of different data sources and analyses that offer cross-country price comparisons in the retail sector. These include aggregated price level Indices (PLIs) published by Eurostat as part of its purchasing power parities (PPPs) programme, more disaggregated Eurostat’s price data published as part of its Consumer Price Research project<sup>16</sup> and Nielsen’s Euro Price Barometer analysis based on the scanner data collected by Nielsen. Each of these data sources and analyses makes its own methodological choice which led to results, which at first glance can appear as inconsistent or even contradictory. However, understanding the strengths and weaknesses of each of the approaches, leads to a more comprehensive view, in which the differences in results can be logically resolved and in consequence each study provides a complementary piece of the overall puzzle.

With that in mind, in this section we proceed to consider in detail the definitions and methods applied to compute statistics that can be informative about comparison of cross-country price levels in the food supply chain. We will consider in turn price level indices published by Eurostat (section 3.2), price

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<sup>15</sup> Available online at: [http://ec.europa.eu/economy\\_finance/publications/publication16073\\_en.pdf](http://ec.europa.eu/economy_finance/publications/publication16073_en.pdf)

<sup>16</sup> See: [http://epp.eurostat.ec.europa.eu/portal/page/portal/hicp/methodology/prices\\_data\\_for\\_market\\_monitoring](http://epp.eurostat.ec.europa.eu/portal/page/portal/hicp/methodology/prices_data_for_market_monitoring).

The most recent report (dated November 2013) is available online at:

[http://epp.eurostat.ec.europa.eu/portal/page/portal/hicp/documents\\_meth/PDMM/Consumer\\_Prices\\_Research\\_2013.pdf](http://epp.eurostat.ec.europa.eu/portal/page/portal/hicp/documents_meth/PDMM/Consumer_Prices_Research_2013.pdf)

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levels published in Eurostat's Consumer Price Research project (section 3.3) and price statistics available through Nielsen's Euro Price Barometer (section 3.4).

### 3.1 Harmonised indices of consumer prices (HICPs)

Harmonised indices of consumer prices (HICPs) are not suitable for cross-country price comparisons for a number of reasons. First and most importantly, there are differences in product definitions which imply that data on different products is collected in different countries. Second, there are many substantial differences between the products that are selected due to differences in the sampling approaches adopted by the national statistical institutes. Also, the products for which prices are observed are not necessarily the most representative products in the market.

Although harmonised indices of consumer prices (HICPs) data cannot be used for cross-country price comparisons, they also need to be discussed to provide an additional background, because the data and methodology for its collection for other indices discussed below is very closely related. The HICP is a monthly inflation measure covering the European Union (EU) countries, Iceland, Norway, Switzerland and Turkey.

The HICPs are computed and published with the primary goal of measuring monthly price inflation, i.e. an increase in the general price level of goods and services over time. This primary goal of measuring inflation implies some methodological choices in data collection and processing that severely limit the potential application of the PLI figures for the assessment of the relative level of competitiveness across the different national markets.

In particular, these aggregated prices indices do not reflect markets in the competition sense. In particular, product market definitions in the competition context are usually narrower than very broad food categories for which HICPs are reported. This is because, generally, even within a single category there are many very different products which are not demand substitutes for each other.<sup>17</sup> Moreover, geographic scope of the retail markets is generally local, while the prices statistics are produced at the national level. For such price comparisons to be meaningful in the competition sense they would need to be done in a much more disaggregated level, both in the product as well as geographic sense.

It is not necessary, and it would not be practically possible, to measure prices for each and every product to compute the HICPs. Thus to compute HICPs a sample of product offers in each elementary aggregate is selected (representative of the price development in that product class). This results in limited coverage.

Second, the product descriptions used for the HICP allow for some flexibility. Price collectors will, in general, select the same products in two consecutive months in order to optimise price comparisons over time, rather comparisons across countries.

However, in order to be able to find a product in each category that would satisfy the representativeness requirements, the product descriptions need to be sufficiently broad and flexible. The reason is that they need to allow price collectors to find in each selected outlet a product that is relevant in that outlet and according to the given product description. This is likely to result in quality differences between products collected by different price collectors in different countries. This is less

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<sup>17</sup> In some situations, products which are not demand substitutes can still be part of the same product market based on their supply-side substitution.

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of a concern for the primary goal of measuring the price inflation, i.e. the level of prices over time rather than across the countries, because price collectors will generally select the same products each month in order to optimize price comparisons over time. In this way, the potential heterogeneity of products over time is controlled for. However, the broad and flexible product selection criteria potentially introduce the problem of product heterogeneity across geographic dimension, most-relevant for cross-country price comparisons.

More generally, there is a fundamental trade-off between the level of detail in product specification and obtained coverage. Narrow definitions would likely result in increased comparability of different product across countries, but on the other hand, would reduce the scope of the market covered by the sampling exercise and thus would reduce the representativeness of the collected data set. Given the primary goal of measuring inflation, the representativeness concerns seem to currently dominate over the product comparability concern. The fundamental trade-off is explicitly acknowledged by Eurostat:<sup>18</sup>

*The process of price collection as developed by the various NSIs differs substantially across countries. National statistical offices may ask their price collectors to collect prices using rather tight product descriptions, or provide very loose product descriptions and ask the price collector to choose a representative product in the outlet. If more harmonized price collection procedures and product descriptions could be developed for use in HICP price collection, this might enrich the results. Further research should be done on the optimum level of specification in the product descriptions. More detail in the product definition would increase the comparability of the products across countries, but on the other hand would lead to a smaller part of the markets being covered.*

There are many substantial differences between the products that are selected due to differences in the sampling approaches adopted by the national statistical institutes. Second, there are differences in product definitions (e.g. tight and loose descriptions) which imply that data on different combination of products is collected in different countries. Third, the products for which prices are observed are not necessarily the most representative products in the market (the HICP does not only follow prices for market leaders). Fourth the comparability over time of price levels will be more limited than that of price indices. Resampling and replacements will result in the observation of differing products over time and there may be differences in actual outlet distribution in the successive samples.

Therefore, HICPs are unsuitable for cross-country price comparisons and authorities/policy makers should not make recommendations or take actions affecting the food supply chain based on HICPs alone.

### 3.2 Price Level Indices (PLIs) published by Eurostat

Price Level Indices (PLIs) are explicitly created to serve as indicators of price level differences across countries. The raw data for PLIs is collected in a similar way as for HICPs, although in separate surveys and according to different sets of product definitions. PLIs are obtained by comparing price levels for a basket of comparable goods and services that are selected to be representative of consumption patterns in the various countries. However, in our assessment at the fundamental level, they suffer from the similar problems as HICPs, although to a lesser extent.

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<sup>18</sup> Eurostat, Consumer prices research (December 2012), available online at: [http://epp.eurostat.ec.europa.eu/portal/page/portal/hicp/documents\\_meth/PDMM/Consumer\\_prices\\_research\\_2012.pdf](http://epp.eurostat.ec.europa.eu/portal/page/portal/hicp/documents_meth/PDMM/Consumer_prices_research_2012.pdf).

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Beside the collection of prices for harmonised indices of consumer prices (HICPs), Eurostat also collects data for and publishes statistics of for the European Union (EU) purchasing power parities (PPPs). The PPPs and HICPS data are collected in a similar way, although in separate surveys and according to different sets of product definitions.

Computation of price level index (abbreviated as PLI) is part of Eurostat-OECD purchasing power parities (PPPs) programme. The computation of PPPs involves national statistical institutes of the participating countries, Eurostat and the OECD.

Unlike HICPs, purchasing power parities are explicitly created to serve as indicators of price level differences across countries. They are obtained by comparing price levels for a basket of comparable goods and services that are selected to be representative of consumption patterns in the various countries. At the lowest level, bilateral relative prices between rather tightly defined individual items are collected. For example, if a box of cereal costs EUR 3.00 in Germany and if in the United Kingdom its price is GBP 2.00, the PPP for cereal between Germany and the United Kingdom is EUR 1.50 to 1.00 GBP. In other words, for every British pound spent on cereal in the United Kingdom, EUR 1.50 would have to be spent in Germany in order to obtain the same quantity (volume) of cereal.<sup>19</sup> These are then scaled to the European Union averages and aggregated to more and more complex aggregates (e.g. food). Although most published PPPs refer to very broad product groups or aggregates like gross domestic product (GDP) rather than to individual products, all of these aggregate PPPs are based on sample surveys of individual goods and services. In essence, PPPs are aggregated price ratios calculated from price comparisons over a large number of goods and services.

PPPs are indicators of price level differences across countries: they indicate how many currency units a particular quantity of goods and services costs in different countries. PPPs can be used as currency conversion rates to convert expenditures expressed in national currencies into an artificial common currency (the purchasing power standard), thus eliminating the effect of price level differences across countries. In this way PPPs can be used to convert national accounts aggregates into comparable volume aggregates - for example, to compare the gross domestic product (GDP) of different countries without the figures being distorted by differing price levels in those countries.

Within the framework of the Eurostat-OECD purchasing power parities (PPP) programme, surveys on prices of household goods and services are carried out cyclically in the EU Member States, EFTA countries, candidate countries (Montenegro, the former Yugoslav Republic of Macedonia, Serbia and Turkey) and two western Balkan countries (Albania and Bosnia and Herzegovina).

A substantial limitation to PPPs usefulness and quality is the low frequency with which the surveys are conducted. Each survey cycle comprises six surveys that are related to a particular group of household consumption products. With two surveys per year the whole cycle takes three years to conclude. If the price of a particular good or service has been collected for an earlier reference period then detailed consumer price indices are used in order to extend the time series to the most recent period. Thus data between cycles is extrapolated. HICPs data would have a substantial advantage regarding the frequency (being collected on a monthly basis).

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<sup>19</sup> The same idea is used to construct a “Big Mac index”, which is another popular (unofficial) measure of purchasing power parity.

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The price level indices are obtained from the purchasing power parities by dividing the purchasing power parities by the nominal exchange rate (i.e. converting the purchasing power parities to a common currency).<sup>20</sup>

The price level index published by Eurostat is a ratio, which expresses the price level of a given group of goods and services in a given country relative to the average price level benchmark of the same group of goods and services. For example, in Eurostat's practice it is most common to use as a benchmark the average price level for the European Union as a whole, although other bases for comparison (e.g. Eurozone or the founding EU-15 member states) are also possible and publically available.

The PLIs are then usually interpreted as follows. If the price level index of a country is higher than 100, the country concerned is relatively more expensive compared to the benchmark (e.g. EU average), while if the price level index is lower than 100, then the country is relatively cheaper than the benchmark.

PLIs are highly aggregated and as such they only reflect a very coarse view of price comparisons of a large number of goods and services across countries. For example, Eurostat publishes detailed information on price level indices for only about 30 different groups of goods and services. The main category relevant for the grocery sector is food and non-alcoholic beverages (category code A0101 according to COICOP classification), which is further split into two subcategories: food (A010101) and non-alcoholic beverages. The food category is further disaggregated into seven subcategories: (1) bread and cereals, (2) meat, (3) fish, (4) dairy products (milk, cheese and eggs), (5) oils and fats, (6) fruits, vegetables, potatoes, and (7) other food products. No further disaggregation of the categories is reported. Of some relevance to the grocery sector might be also another main category of alcoholic beverages, tobacco and narcotics (A0102), which is further split into two subcategories, i.e. alcoholic beverages and tobacco. However, the variation across national prices for tobacco and alcoholic beverages is substantially higher than for food and non-alcoholic beverages and mainly due to large differences in the level of taxation of these products, so using PLIs for price comparisons across countries for these products for competition purposes is meaningless.<sup>21</sup>

To understand the strengths and weaknesses of the PLIs comparison it is also important to know the context and methodology in which the underlying raw price data is collected and aggregated. The disaggregated data used by Eurostat to compute the PLIs are the same as the data collected for the purposes of computation and publication of the purchasing power parities (PPPs).

Furthermore, the prices observed by the price collectors are those of product-offers, i.e. the price observer collects the price at which a product is offered in an outlet. This means that short-term consumer responses to changing market circumstances do not influence the resulting average price. For example, if a special offer in one outlet induces a large number of consumers to buy the product there at a low price this will affect the average price paid by consumers but at the same time it will not affect the average of the price offers collected and used for the PLI calculations. This is because at the most disaggregated level average prices are computed by using an un-weighted arithmetic average of the price observations, rather than sales (volume) weighted average, which would be reflective of the actual consumption patterns. Thus PLIs do not take the volume effect of sales promotions into account and do not reflect the short term consumption patterns.

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<sup>20</sup> See Eurostat glossary: [http://epp.eurostat.ec.europa.eu/statistics\\_explained/index.php/Glossary:Price\\_level\\_index\\_\(PLI\)](http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:Price_level_index_(PLI))

<sup>21</sup> The prices used to compute PLIs include indirect taxes (e.g. VAT or excise taxes), so cross-country comparisons of PLIs are affected by the potential differences in the level of taxation of different products across different counties.



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Because of these methodological issues and high level of aggregation, Eurostat emphasises that PLIs are not intended to rank countries strictly, but rather that they can only provide a general indication of the order of magnitude of the price level in one country in relation to others. This is particularly the case, if multiple countries are clustered around a very narrow range of outcomes. In Eurostat's own words:<sup>22</sup>

*the degree of uncertainty associated with the basic price data and the methods used for compiling PPPs, may affect in such a case the minor differences between the PLIs and result in differences in ranking which are not statistically or economically significant.*

Therefore, the authorities/policy makers should not make recommendations or take actions affecting the food supply chain based differences in PLIs that are economically or statistically insignificant.

### 3.3 Detailed Average Prices (DAPs) published by Eurostat's Consumer Price Research project

The Detailed Average Prices (DAPs) project was developed with an explicit intent to address the need for more detailed price level data. It is constructed using a reduced version of the standard product definitions used also for the purchasing power parities (PPPs). Product definitions used are more precise than these used for PLIs. Moreover, because of data issues the product coverage of DAPs project is very limited. Finally, current DAPs coverage is very spotty and definitely not representative. For products for which data is available, it should nevertheless be considered more accurate than using PLIs.

The Detailed Average Prices (DAPs) project was developed by Eurostat in 2008 with the aim to supplement the price level indices computed on the basis of purchasing power parities (see Section 2.1 above). The DAPs were created with intent to address the need for more detailed price level data. The results of the DAPs are used e.g. in the 'Consumer Markets Scoreboard'. In this section we explain in more detail how the DAPs are compiled and how they can be interpreted. Eurostat, however, again warns upfront that the resulting detailed average prices should only be regarded as "indicative price levels".

The products used for the DAPs research are specified using a reduced version of the standard product definitions used also for the purchasing power parities (PPPs).

PPPs are based on a selection of products according to the same strict product description. Using PPP data would in principle give more comparability of product specifications across countries. However, in many cases these products are available and observed only in part of the countries and only contribute to the price level comparisons among these countries. The PPP survey is only conducted once per three years because supplying PPP data more frequently would involve considerable additional costs. Moreover PPP data at present is limited to capital cities. Finally, the number of price quotes collected per product is low so, at the most detailed level, the existing PPP data set has not been considered sufficiently reliable for publication.

All prices provided by national statistical institutes are in national currencies. For the countries which have not adopted the euro they must be converted to euro prices by Eurostat using euro exchange rate. This is, of course, also a potential source of a measurement error and in particular by short term

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<sup>22</sup> [http://epp.eurostat.ec.europa.eu/statistics\\_explained/index.php/Glossary:Price\\_level\\_index\\_\(PLI\)](http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:Price_level_index_(PLI))

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fluctuations in exchange rates. The impact of the exchange rate conversion on prices depends on a number of other factors, such as whether products are imported or produced locally, their tradability and other reasons.

There are factors which influence price differences and limit the comparability of the results across countries. For example, a single product might not represent the full market in all countries for the consumption segments involved. For example, the average price of a loaf of white bread collected for the purposes of DAPs may be misleading about the price level of bread in general in a given country. In other words, while DAPs are intended to improve the quality of cross-country price comparisons by narrowing product definitions relative to PLIs, at the same time their cost is reduced coverage. This is another manifestation of the basic trade-off discussed earlier.

The European Commission document “A better functioning food supply chain in Europe” cites also many additional factors that can differ across countries and affect prices. They include cultural habits, limited tradability of food products, general standard of living, tax regime, demographic structure, market dynamics and labour costs.<sup>23</sup> Even within the boundaries of the product descriptions, quality differences do exist to a varying degree. Some products might be by their nature more homogeneous (e.g. sugar or white rice) than other products (e.g. fresh meat or cheese). Thus the impact of potential quality differences can be different for different groups of products. While for relatively homogeneous products their nominal prices can be meaningfully compared, for highly differentiated products it is very difficult to ensure that prices for products of comparable quality are measured across countries or are even available on the market.

Even if compared products are in fact identical across countries, they may not have the same relevance for the consumers in the different countries (e.g. Italians might consume significantly more pasta per capita than Swedes). A product may be a market-leader in one country and a niche product in another country. If there are economies of scale in distribution of the product, then other factors such as differences in costs, rather than e.g. differences in competitive conditions might be responsible for potential differences in observed prices.

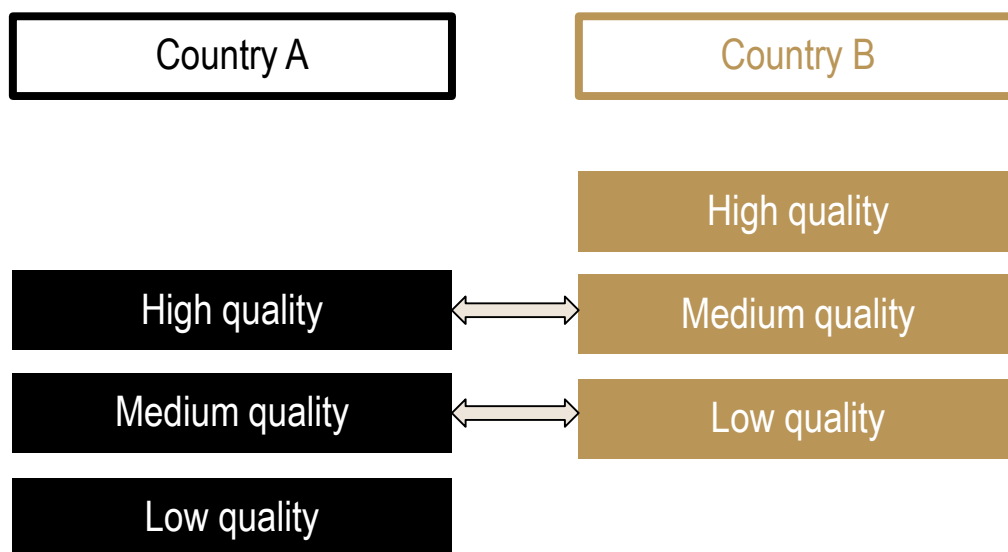
The positions of the selected products on national markets may differ across countries even within the limits of the product description used. What might be considered a high-quality product of that type in a non-producing country, can be considered e.g. only to be of medium or average quality in the producing country. For example, the meaning of a ‘cheese, Camembert type’ might be different in France and in other countries. Potential mismatch of quality levels is schematically illustrated in Figure 1.

While the effort to harmonise the quality standards and account for them in the data collection process is ongoing, some quality differences are likely to persist. For example, we understand that product descriptions used try to control for the brand effects, by specifying whether the product is branded or not and whether the brand is premium or not, but on the other hand they often do not specify the brand exactly. Thus it is still possible for the price collectors in one country to consider a specific brand as a “premium” brand while the same brand by a different price collector in a different country can be considered just a regular (medium quality) brand.

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<sup>23</sup> See “A better functioning food supply chain in Europe”, available online at: [http://ec.europa.eu/economy\\_finance/publications/publication16061\\_en.pdf](http://ec.europa.eu/economy_finance/publications/publication16061_en.pdf)

Figure 1: Potential mismatch of quality levels.



Source: E.CA Economics.

Also, the observed price difference might be attributed at least partially to the differences in the outlet structures across countries. Typically, prices of identical products will differ to an extent depending on the outlet type (discounter, supermarket or convenience store). So for example, if in one country supermarkets and discounters are substantially more common, while in another country convenience stores dominate, observed price differences across countries can be related to differences in market and outlet structure. It is also unclear to what extent this has implications for competitive assessment. For example, on one hand, supermarkets and discounters might have a more efficient cost structure (leading, other things equal to lower prices), while at the same time can lead to a higher concentration and less competitive environment. Which of these two effects dominates is an empirical question that cannot be resolved based on theory alone.

The relationship between country's income (e.g. as measured by GDP) and its price level (including groceries) is somewhat tricky. If hedonic prices are measured perfectly (quality is perfectly observable) in a well-functioning competition one might expect equal prices across countries, as prices should not depend on income. However, in practice higher income is likely to lead to preferences for products of higher quality and if quality is not perfectly observable (as we argue is the case in practice with PLIs and DAPs), observed prices might be positively correlated with income. This would not be indicative of competition issue, but rather a manifestation of a problem of correctly measuring hedonic prices. Similarly, if labour costs are higher in high income country (because national labour markets are not integrated) one would also expect higher prices in high income countries, which are due to higher costs, rather than reduced intensity of competition. These effects are difficult to disentangle when analysing simple summary statistics and could only be potentially tackled, subject to the availability of suitable data, by more complex statistical (econometric) analyses.

Relatedly, the distribution of outlets in which the samples at the individual product level are collected might not be representative of the distribution of outlets where the product is actually sold. For example, if prices for a product are observed mainly at supermarkets, while a large volume of the product is sold also through other distribution channels, the collected average prices may be substantially different from average prices actually paid by the consumers. In a proper competition setting, price collections would be disaggregated and broken down by the distribution channel or

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format to account for potential differences in prices across channels or formats. The collection and aggregation of data prepared for the DAPs does not allow that.

The samples may cover only price for some types of brands and exclude some other brand levels. If the selection of brand levels for the same products differs across countries, this will adversely influence comparability.

The observed differences in prices across countries are additionally affected by factors such as the differences in taxes (observed prices include taxes), the differences in labour costs (particularly important for goods produced locally), differences in distribution costs, differences in the tradability of products or differences in retailers' rents (competition).

The latest DAPs report summarises the practical and methodological obstacles in defining and computing the meaningful price data statistics that could be used for cross-country price comparison as follows:<sup>24</sup>

*There is a strong need to define in more detail the conceptual framework for DAP and to assess to which extent these prices are comparable within and across countries. The concerns raised refer to issues such as the differences in the precise product definitions, the partly large coefficient of variation, the meaningfulness of the concept of average prices from a methodological point of view and the difficulties to derive the required information from the HICP collection of basic data.*

### 3.4 Scanner data

Scanner data is collected at the highest possible level of disaggregation. This leads to very narrow categories of essentially homogeneous products (as defined by a SKU). On the other hand, the coverage of the data set is also limited, as not all SKUs are offered in multiple countries and only products with the same SKU can be taken into consideration for analysis.

Scanner data, like for instance Nielsen's Euro Brands Price Barometer, is substantially different in a number of dimensions from the Eurostat data (underlying all HICPs, PLIs and DAPs, discussed above).

First, and perhaps most importantly, it relies on the actual sales data of real customers, rather than price offers observed by price collectors.

Second, the data is collected at the highest possible level of disaggregation, i.e. SKU. In other words, only products with the same SKU offered in multiple countries are taken into considerations. Because products at the SKU level can be considered to be perfectly homogeneous (typically, even slightly differentiated products will have a different SKU, while it is also possible that homogeneous products have different SKUs and thus are excluded from the analysis by Nielsen), the issues of potential cross-country quality differences between products has been completely eliminated with this approach. However, this at the same time might severely limit the coverage of that analysis - some products categories (e.g. fresh food) are sold without SKUs, while the degree to which SKUs overlap across countries also differs across product categories.

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<sup>24</sup> Eurostat, Detailed average prices report (November 2013), available online at:

[http://epp.eurostat.ec.europa.eu/portal/page/portal/hicp/documents\\_meth/PDMM/Consumer\\_Prices\\_Research\\_2013.pdf](http://epp.eurostat.ec.europa.eu/portal/page/portal/hicp/documents_meth/PDMM/Consumer_Prices_Research_2013.pdf)

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Limited coverage notwithstanding, because scanner data controls for factors such as product quality or actual purchase volumes, it seems that this kind of dataset is most suitable for the assessment of the degree of functioning of competition in the market. This is particularly true for the categories, in which its coverage is relatively high, where the criticism of inadequate coverage applies to a lesser extent.

In particular, the price data based on scanner data - such as Nielsen's Brand Euro Price Barometer - offer the following advantages over aggregated price indices published by Eurostat:

- Highly disaggregated data available at the product and regional level which allow construction of price variables meaningful for product and geographic markets relevant from the competition policy perspective.
- A large number of prices is available for identical or highly comparable food products, which allows to (indirectly) control for (unobserved) product quality.
- Actual transaction prices are used as opposed to observed offer prices collected by Eurostat. Together with sales volume data (also available in scanner data), this accounts for factors such as temporary sales promotions which are largely ignored when collecting offer prices.
- Scanner data is collected continuously and so can be available with frequency much higher than survey data. This is important as consumers consumption patterns can change very rapidly, in particular in response to relative short term price changes.

Technological progress makes collection of ever more detailed sales data easier and increases general availability of such data. Moreover, the competition authorities are familiar with scanner data as this type of data is routinely requested and used in competition enforcement, e.g. to inform merger assessment. Given its advantages over data collected in surveys, this seems to us to be a preferred source of data to inform policy decisions.

However price comparisons in general are just a single aspect that needs to be taken into account. Same prices across countries are not necessarily indicative of equally well functioning competition, e.g. when costs across the countries differ substantially. For that reason, any assessment of functioning of competition should focus on margins rather than prices, which, unlike prices, take underlying costs into account.

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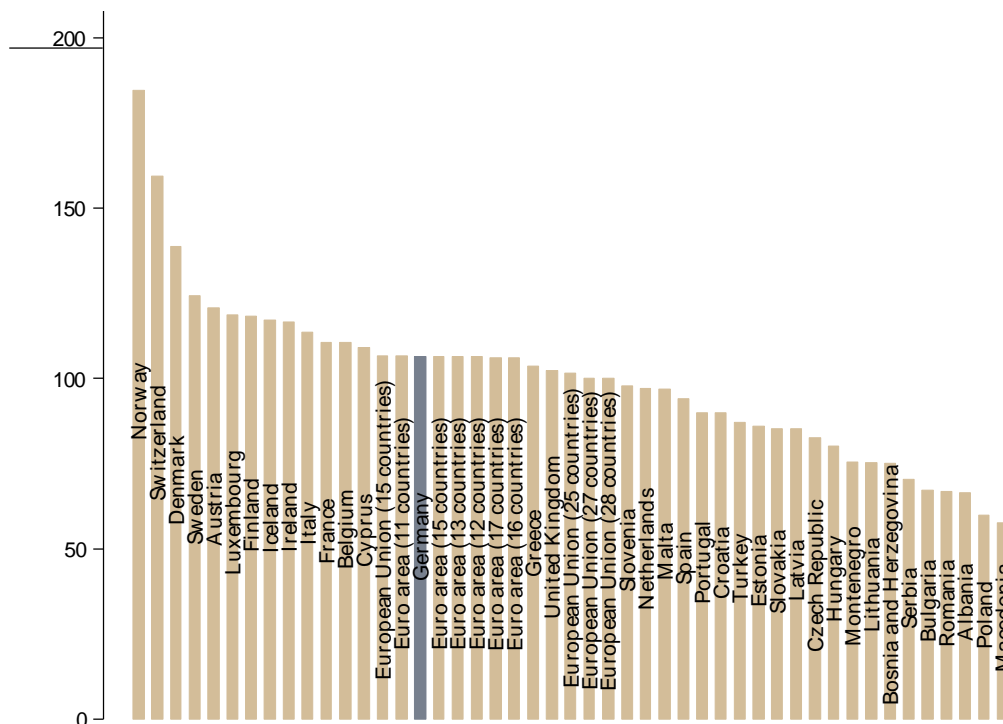
## 4 Interpretation of available results for competitive assessment

### 4.1 Price Level Indices (PLIs) published by Eurostat

Based on the PLI statistics published by Eurostat for 2012 (the most recent year available as of beginning of 2014), price levels for food vary considerably across the EU Member States. The price level index for food and non-alcoholic beverages in 2012 were the highest in Denmark (142.8% of the EU-28 average) and the lowest in Poland (61.6% of the EU-28 average). The same price index level for Germany was at 106.0%, i.e. slightly above the EU-28 average. A pairwise comparison shows, however, that average food level prices as measured by PLI were lower in Germany compared to other large EU economies, except UK. For example, food and non-alcoholic beverages PLI was 111.6% for Italy, 108.8% for France and 103.6% for the UK.

The level of price level indices in 2012 for different European countries is illustrated in Figure 2.

**Figure 2: Price Level Indices for food for European countries in 2012 (base EU-28)**



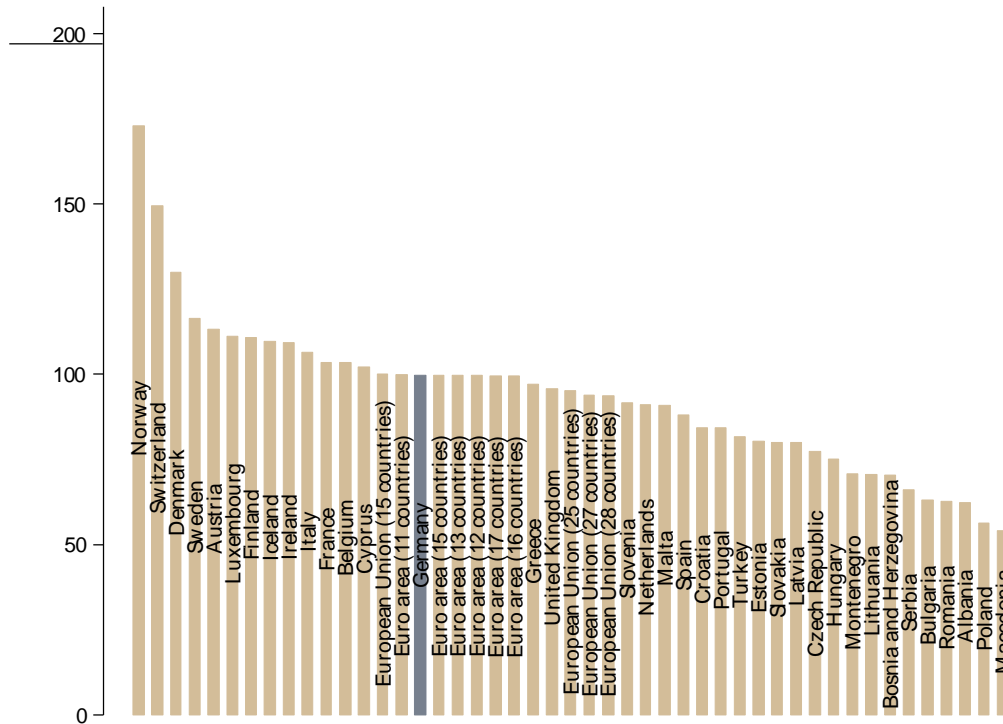
Source: E.CA Economics based on Eurostat data.

The fact that in general the level of food prices is lower in new Member States is probably better illustrated if EU-15 is used as a benchmark for comparison rather than EU-28. Prices in Germany in 2012 were very marginally below the EU-15 benchmark at 99.9%. This suggests that PLIs might be correlated with income, given that average income (GDP) levels in EU-15 countries is higher than in EU-28

countries. This is further confirmed by very high PLIs for Norway (186.0%) and Switzerland (154.2%), some other high income countries.

The level of price level indices in 2012 for different European countries when EU-15 is taken as the benchmark is illustrated in Figure 3.

**Figure 3: Price Level Indices for food for European countries in 2012 using EU-15 as the benchmark**

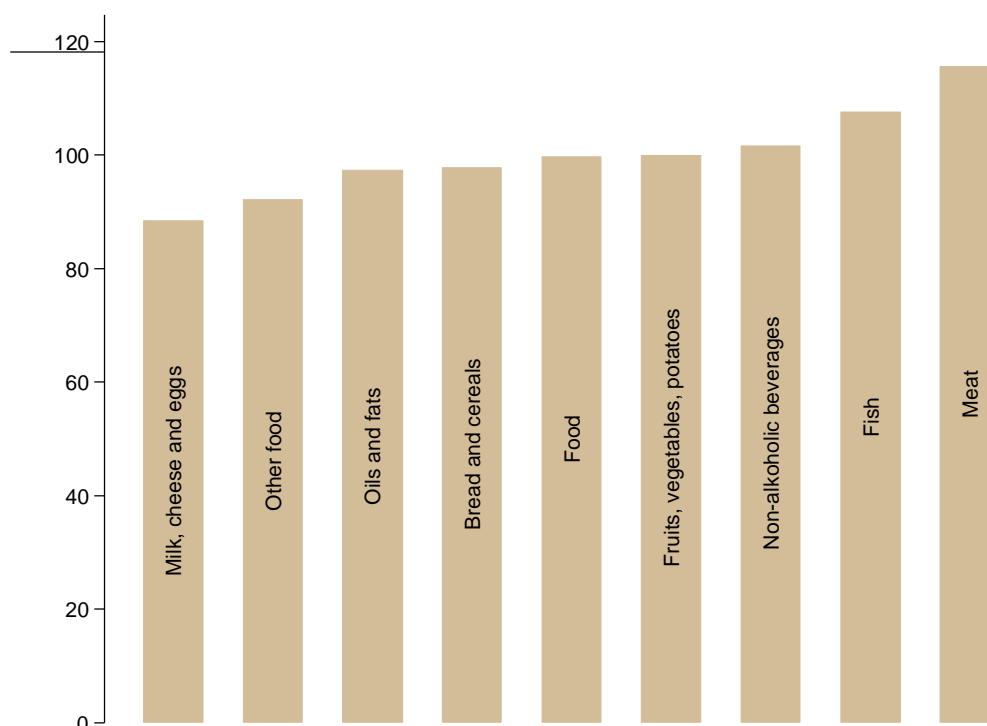


Source: E.CA Economics based on Eurostat data.

Looking at more disaggregated level is also quite informative. Sticking to EU-15 as the benchmark, PLI for food only in Germany were also at 99.9%, while PLI for non-alcoholic beverages was 100.8%. Disaggregating the food category further, the PLI for bread and cereals in Germany in 2012 was 97.9%, for meat it was 115.7%, for fish it was 107.6%, for milk, cheese and eggs 88.2%, for oil and fats 97.2%, for fruits, vegetables, potatoes 99.9% and for other food 92.2%. Thus price levels in Germany as measured by the PLIs were lower than EU-15 average in 5 out of 7 food sub-categories, exceeding the benchmark only for meat and fish.

One has to remember that minor differences between the PLIs (including the resulting differences in rankings) are not statistically or economically significant. Thus based on these aggregated numbers there are no indicators that competition in the German grocery retail market is functioning poorly, or, more precisely, functioning worse than in other European countries.

Figure 4: Price level indices for Germany for different food subcategories in 2012 (base EU-15)



Source: E.CA Economics based on Eurostat data.

Additionally, one should remember that PLI for a given country is calculated as its purchasing power parity (PPP) divided by its annual average exchange rate to the euro. Thus large exchange rate movements significantly affect the values of PLIs. An appreciation of a country's currency against the euro will make the country look more expensive in comparison to euro area countries and this will show as an increase of the relative price level expressed as the PLI. This might explain, at least partially, relatively high PLIs for Norway, Switzerland and Sweden, the currencies of which have appreciated substantially against the euro between 2009 and 2012. This is consistent with high position of these countries in the food PLI rankings and, in particular, in changes of their relative positions in the ranking compared e.g. to 2009. PLIs of countries within the Eurozone are independent of short-term currency fluctuations and thus probably more reliable as a benchmark.

## 4.2 Detailed Average Prices (DAPs) published by Eurostat's Consumer Price Research project

Five DAP projects were performed using June prices in 2008, 2009, 2010, 2011 and 2012. Their results are published on Eurostat's website.<sup>25</sup>

The scope of the project was more limited in the past and was gradually systematically expanded. In 2008 there were 66 products monitored by the DAP project, of which 26 were in the food and non-alcoholic beverages category. In 2009 the numbers were 79 and 32 respectively, while in 2010 they

<sup>25</sup> [http://epp.eurostat.ec.europa.eu/portal/page/portal/hicp/methodology/prices\\_data\\_for\\_market\\_monitoring](http://epp.eurostat.ec.europa.eu/portal/page/portal/hicp/methodology/prices_data_for_market_monitoring)



were 87 and 33 respectively. Currently (in 2011 and 2012), the DAP project collects prices on 156 product overall, out of which 52 are in the food and non-alcoholic beverages category.

In spite of a large number of products, not all prices for all products are reported. This is mainly due to the potential data quality issues. In particular, for some products the consumption level or even availability could be so low, that it was not part of the sample in a given country. Additionally, the observed product might not meet the product specifications. If differences in the product description requested by Eurostat and reported by national institutes were considered significant - implying that the prices may be non-comparable across countries - the corresponding price is not reported.<sup>26</sup> Additionally, Eurostat reports that some national statistical institutes for various reasons were not willing to supply data for publication.

The following summary table reports the number of products in each year, including also the number of products for which prices in Germany are available. As can be seen from the table, availability of prices in Germany is relatively limited, they are available only for 21 product/year pairs out of 195 product/year pairs reported by DAPs program. Moreover, no price data for Germany is available for 2010. The availability of price data for Germany is a bit higher in 2011 and 2012. Thus, cross-country comparison based on this data set is definitely not representative, although it can still be informative.

**Table 1: The number of product categories reported by DAPs program**

Year	Number of products (overall)	Number of products (food and non-alcoholic beverages)	Number of products with prices in Germany available (food and non-alcoholic beverages)
2008	66	26	2
2009	79	32	3
2010	87	33	0
2011	156	52	7
2012	156	52	9
Total		195	21

Source: E.CA Economics based on DAPs data

The summary statistics of the DAPs data for all combinations of products and years for which price data for Germany is available are presented in Table 2.

**Table 2: Summary statistics of DAPs data for Germany**

Year	Product	Rank of German price <sup>27</sup>	Count of countries	Price in Germany (eur) <sup>28</sup>	Median price (eur)	Mean price (eur)
2008	Mineral water	14	19	0.57	0.40	0.53
2008	Spaghetti	16	19	2.47	2.03	2.01

<sup>26</sup> If there are differences in the product description that are considered by the DAPs program to be “not too large”, the price is reported with a footnote specifying the difference in the product characteristics.

<sup>27</sup> The lowest rank (the rank of 1) refers to the lowest price, etc.

<sup>28</sup> All prices are reported in euro / per unit (reference quantity). The definition of unit differs across products, but is the same across countries. For that reason the precise definition of units for different products has been omitted.

Year	Product	Rank of German price <sup>27</sup>	Count of countries	Price in Germany (eur) <sup>28</sup>	Median price (eur)	Mean price (eur)
2009	Milk chocolate	7	16	8.39	8.69	8.89
2009	Mineral water	17	22	0.54	0.41	0.49
2009	Spaghetti	21	21	2.58	2.02	1.89
2011	Butter	3	21	1.28	1.87	1.84
2011	Cheese	4	14	8.80	9.54	10.59
2011	Fresh milk, unskimmed	4	24	0.70	0.84	0.93
2011	Pizza	8.5	18	3.31	3.34	3.55
2011	Pork, loin chop	14	19	6.21	4.62	5.46
2011	Tomato ketchup	4	17	1.24	2.13	2.09
2011	White sugar	1	27	0.76	1.07	1.12
2012	Apples	21	25	1.89	1.42	1.45
2012	Cocoa instant drink	2	16	3.58	5.69	5.78
2012	Fruit yoghurt	11	21	2.74	2.74	3.07
2012	Milk chocolate	2	23	7.60	9.79	9.70
2012	Pizza	13	21	3.57	3.46	3.52
2012	Pork, loin chop	14	19	6.49	5.48	5.82
2012	Tomato ketchup	5	20	1.40	2.29	2.12
2012	White sugar	2	27	0.94	1.13	1.13
2012	Whole chicken	3	25	2.35	2.88	3.36

Source: E.CA Economics based on DAPs data.

Overall, the data indicates that - for the products reported - in 2012 Germany was a relatively cheap country.<sup>29</sup>

For example, Germany was the second cheapest country for cocoa instant drink (powder) out of the 16 countries with reported prices, with only Belgium being reported to be cheaper. It was also the second cheapest country for milk chocolate (out of 23 countries reporting prices), with only Bulgaria reporting lower prices for that product. Germany was also the second cheapest country for white granulated sugar (out of 27 countries reporting prices), with only Poland being cheaper. Similarly, Germany was the third cheapest country for whole chicken (out of 25 countries with reported prices) with lower prices reported only in Poland and Portugal and it was the fifth cheapest country (out of 20) for tomato ketchup (out of 20 countries with reported prices). Interestingly, in this category the five cheapest countries, including Germany, reported a significantly lower level of prices than the remaining

<sup>29</sup> The availability of prices for other countries also differs substantially as can be seen in the count of countries column in Table 2.

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countries. Thus for 5 out of 9 products for which prices in Germany were reported in 2012 it was ranked as one of the cheapest countries.

For the remaining four food product categories, prices in Germany rank a bit higher. For example for fruit yogurt Germany ranks exactly in the middle, as 11<sup>th</sup> out of the 21 countries which reported prices for that product. Germany ranks as 13<sup>th</sup> cheapest (out of 21 countries reporting prices) for frozen pizza, as 14<sup>th</sup> cheapest (out of 19 countries) for pork loin chops and as 21<sup>st</sup> cheapest country (out of 25) for apples. Unlike some of the categories in which Germany was reported to be among the cheapest countries and where products can be thought to be relatively homogeneous (e.g. white sugar or cocoa powder drink), the last two categories (pork loin chops and apples) are categories where product quality might be particularly difficult to assess. This suggests that indeed price comparisons may be affected by quality differences discussed at more length in section 3.3.

Results for earlier years paint broadly a similar picture. In 2011 Germany was the cheapest of all the reporting countries for white granulated sugar. It was the 3<sup>th</sup> cheapest of all the reporting countries for butter, the 4<sup>th</sup> cheapest for fresh unskimmed milk, cheese of camembert type and tomato ketchup. It ranked a bit higher for the remaining two products with reported prices: 8<sup>th</sup> for frozen pizza, and 14<sup>th</sup> for chopped pork loin, although for that last product, almost all the countries with prices lower than in Germany are new member states from central and Eastern Europe, while prices in the Netherlands, Italy or Ireland are higher than in Germany.

No prices for Germany are available for 2010.

Germany ranks as relatively expensive country for spaghetti in 2008 and 2009 (in 2009 being actually the most expensive country for that product) and for carbonated mineral water. In 2009 Germany ranked as the 7<sup>th</sup> cheapest of the 16 countries for milk chocolate, and it has improved its ranking for that product to 2<sup>nd</sup> cheapest in 2012.

All the prices and their rankings for all the products for which DAP program price data for Germany is available are graphed in the appendix.

## 4.3 Scanner data

As an example of price comparisons based on scanner data we report in the following results of the Euro Brands Price Barometer (EBPB).<sup>30</sup> The last available issue of the EBDP was prepared in January 2013 covering the first half year of 2012.

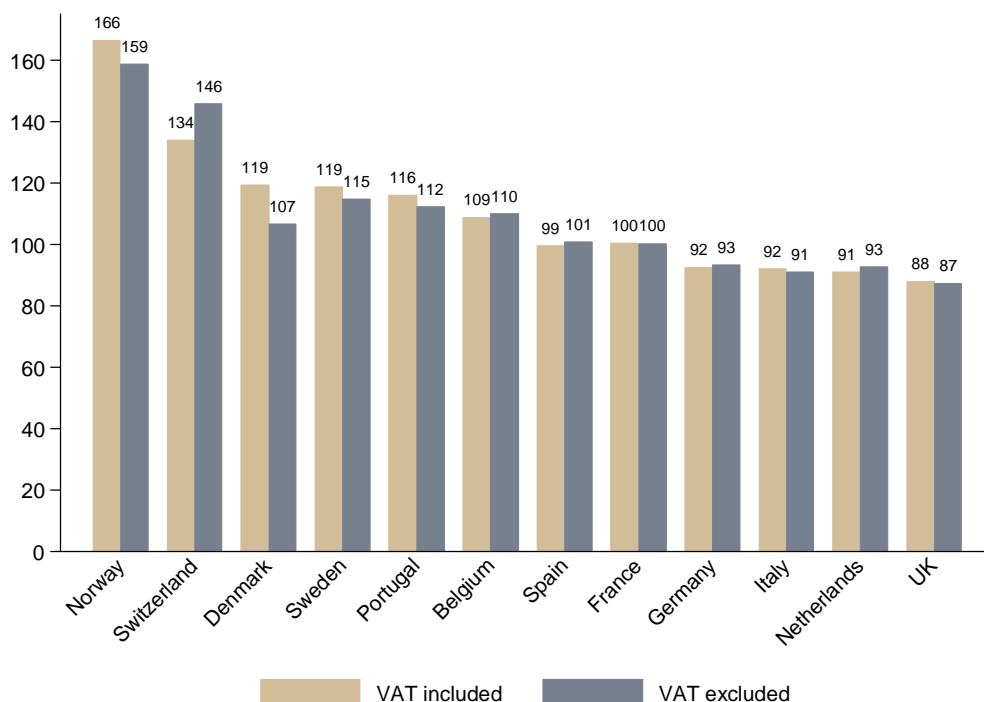
When comparing the EBPB ranking (see Figure 5) with the PLI indices (as given in Figure 3) several differences - in addition to the methodological differences - have to be accounted for. First, because of their geographic coverage, Nielsen reports results only for a relatively small selection of countries (12 countries, including 10 EU countries and Norway and Switzerland). Second, the EBPB covers a broader range of product categories, including cosmetics & fragrances, personal care, beverages alcoholic, pet food, homecare health care and others. Food and non-alcoholic beverages, which are covered also by the PLI account for roughly 50% of the overall basket only. Third, PLIs include VAT and, hence, should be compared with the appropriate EBPB number.

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<sup>30</sup> The Euro Brands Price Barometer is collected by Nielsen, a commercial data provider, and is prepared for the European Brands Association (AIM), an industry association representing leading European branded products producer.

In fact one observes important differences in the general rankings. While both statistics find a cluster of high price countries, namely Norway, Switzerland, Denmark and Sweden, with Norway and Switzerland being price leader by far, the rankings in the mid to lower range differ significantly. The PLI find a group of mid-priced countries comprising Italy, France, Belgium, Germany, UK and the Netherlands, and a low priced country cluster comprising Spain and Portugal. The EBPB finds at the middle ranks Portugal, Belgium, Spain and France and a group of low price countries comprising Germany, Italy, the Netherlands and the UK (all countries are listed in descending rank order).

**Figure 5: Relative prices of branded products in different European countries based on Nielsen SKU data (Euro Brands Price Barometer, 2012H1 results)**



Source: Nielsen Euro Brands Price Barometer (EBPB), 2012H1 results.

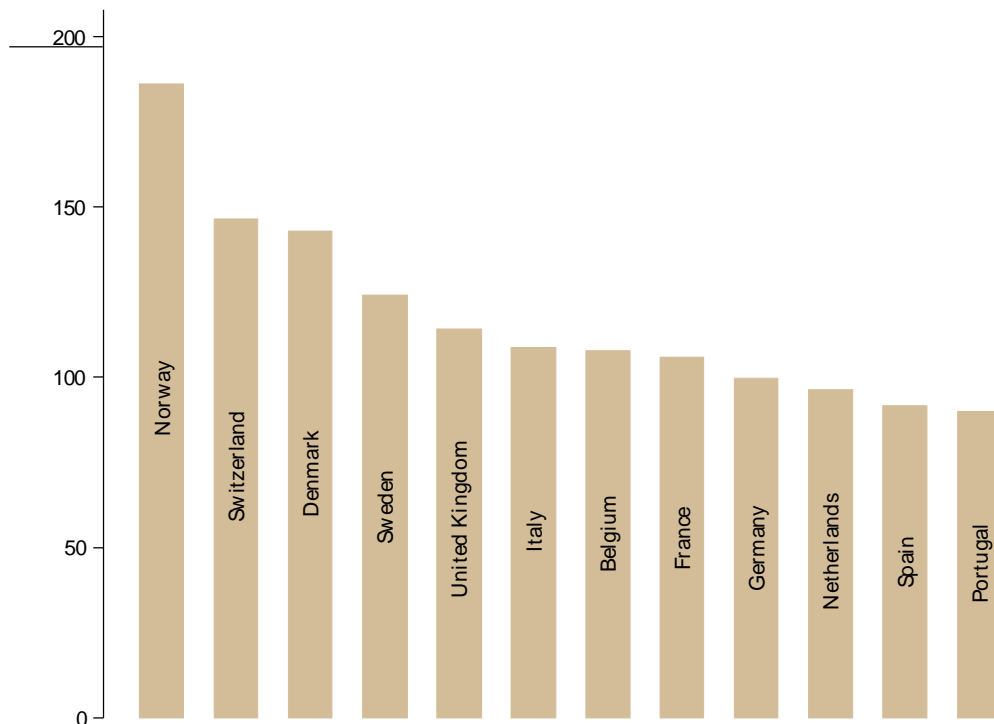
In order to account for some of the described methodological differences between the two data sources, we selected the Price Level Indices for the same countries that are considered by Nielsen in the EBPB (i.e. in Figure 5). Additionally, these Price Level Indices have been rescaled in the same way as in Nielsen’s calculations for the EBPB, namely by dividing all PLI values by the simple average of the Eurozone-7 countries (Belgium, France, Germany, Italy, Netherlands, Portugal, and Spain). Finally, we included also alcoholic beverages to bring the product basket of the PLIs as close as possible to the product basket used in the EBPB. It needs to be noted though that substantial differences between the two product baskets remain.<sup>31</sup>

<sup>31</sup> Depending on the country, the five categories “FOOD AMBIENT”, “CONFECT & SWEET BISCTS & SNCKS”, “FOOD - PERISHABLE”, “BEVERAGES - NON ALCOHOLIC” and “FOOD FROZEN” together account for between 40% and 80% of the category items in the baskets considered by Nielsen. Alcoholic beverages account for another 0% to 18% of the category items in the Nielsen data, also depending on the country. On average the product categories mentioned above represent around 70% of the total EBPB basket, i.e. there is on average a 70% overlap between the PLI (including alcoholic beverages) and the EBPB basket.

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One can see in Figure 6 that indeed after these corrections Germany moves up in the EBPB rankings, but still remains - in contrast to its position in the PLIs - significantly below the average.

**Figure 6: Price Level Indices for food and beverages for European countries in 2012 (only countries also reported in Nielsen EBPB, base: simple average of Eurozone-7 countries according to Nielsen EBPB)**



Source: E.CA Economics based on Eurostat data.

Notes: For each country, the PLI is calculated as the weighted average of its (i) PLI for food and non-alcoholic beverages and (ii) PLI for alcoholic beverages. The weights are the country's corresponding shares of these two categories in the category item basket, with the sum of these two shares normalized to 100% for each country. The resulting PLIs are rescaled by the simple average of the Eurozone-7 countries, i.e. Belgium, France, Germany, Italy, Netherlands, Portugal, and Spain.

Despite of these efforts to make the data comparable, it remains difficult to judge whether the different ranking of countries of the two methodologies is related to the different level of aggregation or to different rankings within the food and beverage categories. On the latter point we saw before that for instance for the example of Germany for product categories which are typically not open for a scanner data analysis, like meat and fish, Germany ranks higher than the average. Hence, the better relative ranking of Germany in the scanner data could be a) because products for which Germany is more expensive are excluded while other categories are included which are in Germany cheaper or b) because the PLI method mismeasures quality, and hence, for countries with a relatively high quality level distorts its ranking towards higher prices.

In contrast the EBPB price comparison is done for the most disaggregated product categories (at SKU level), so it does not suffer from a potential quality bias due to omitted quality characteristics. Thus, if quality is positively correlated with income, as we argued above on a theoretical basis, one would expect the scanner based ranking to be less correlated with income and a less biased price ranking.

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## 4.4 Conclusion

At the most aggregated level, food price level in Germany meet different European averages. Thus, judging by the price level alone, this indicates that the retail food markets in Germany are on average as competitive as retail food markets elsewhere in Europe. This result is potentially affected by the methodological issues discussed before though.

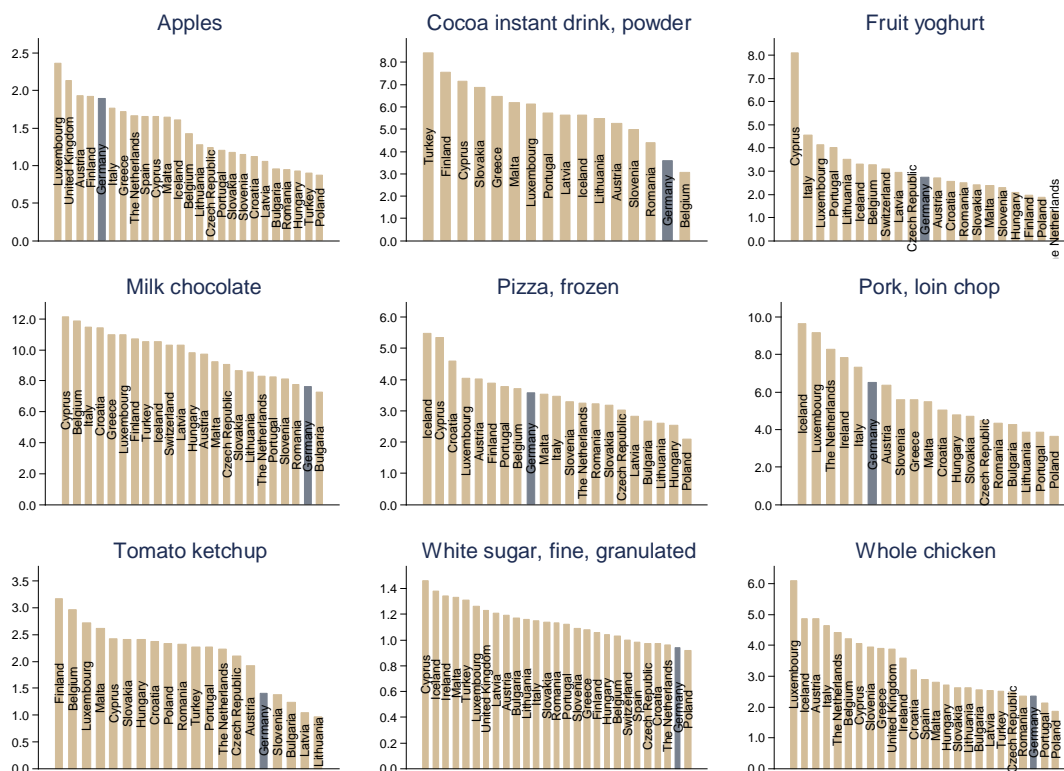
All data sources analysed are consistent in showing that at the more disaggregated level for food categories for which product quality differences are relatively unimportant (products are relatively homogenous) or can be properly controlled for (branded products) prices in Germany on average are actually lower than in many other European countries, in particular other EU-15 countries.

Survey data suggest that price level in Germany might be slightly higher for food product categories for which product quality is important but difficult to measure, such as meat, fish or fresh fruit. There are a number of plausible theoretical explanations for the observed differences in prices, including differences in product quality, differences in underlying cost structure or other factors (e.g. outlet distribution). These product categories are underrepresented in the SKU scanner data, so they cannot be analysed using that data and methodology.

# Appendix 1 Detailed graphical representation of data

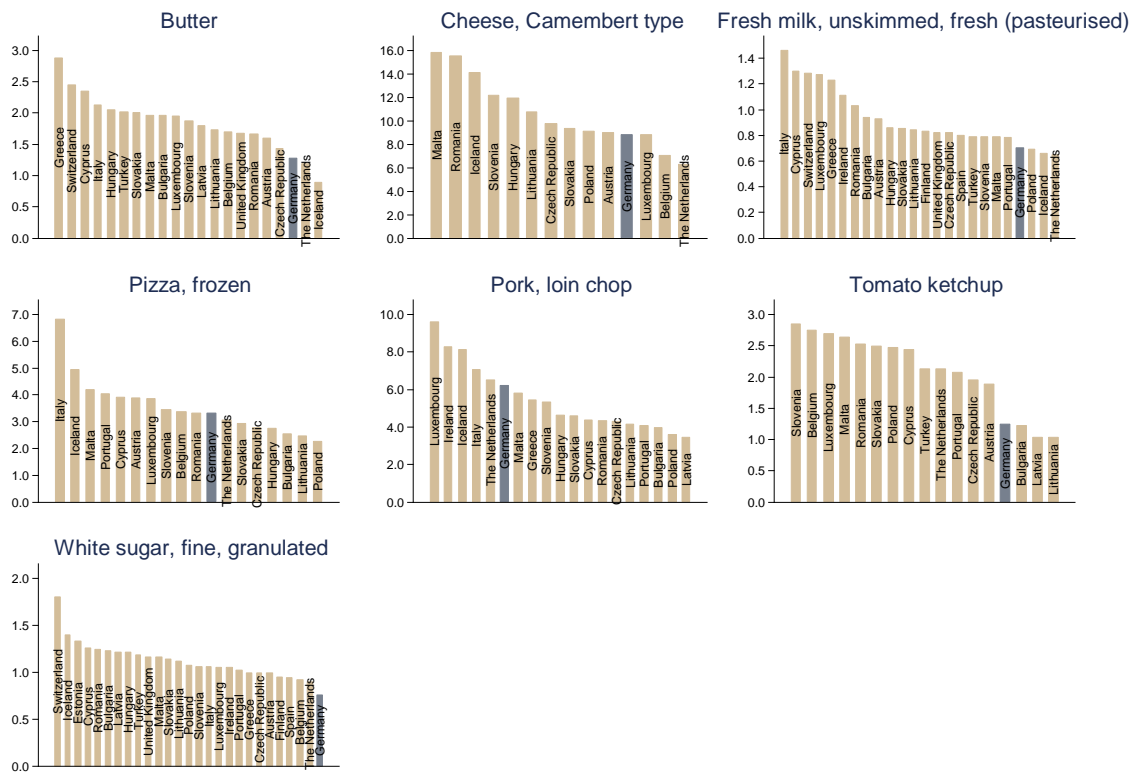
## A1.1 Cross country price comparisons based on DAPs data

Figure 7: Cross country price comparisons for 2012 based on DAPs data



Source: E.CA Economics based on DAPs data.

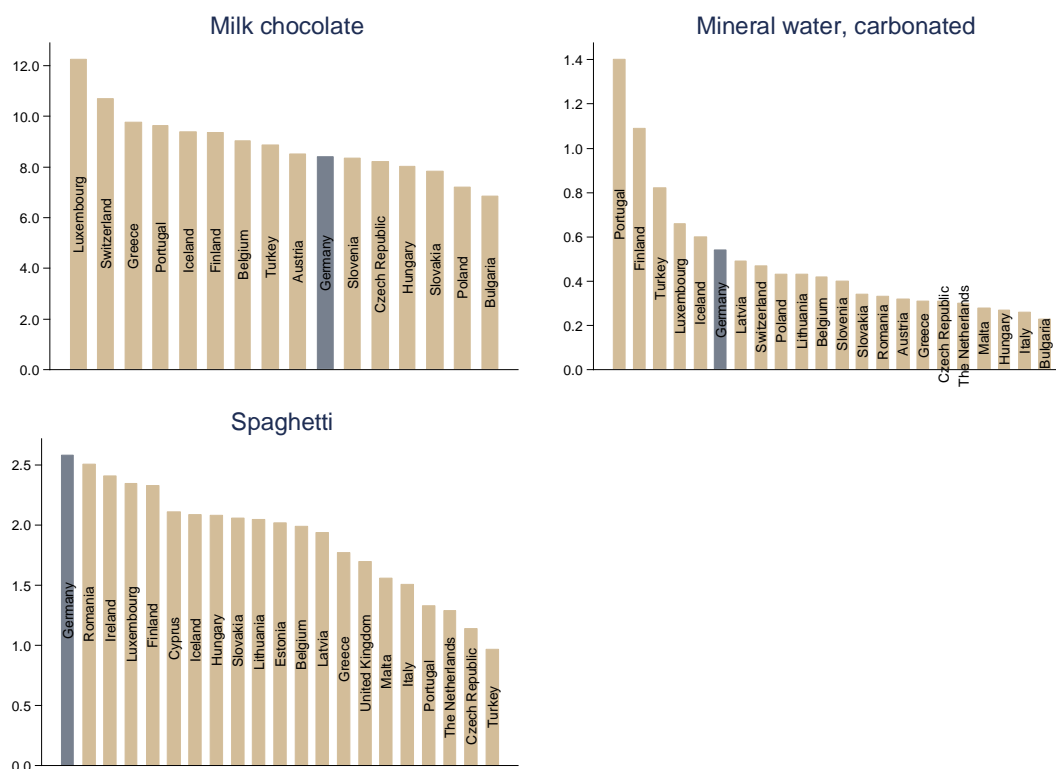
Figure 8: Cross country price comparisons for 2011 based on DAPs data



Source: E.CA Economics based on DAPs data.

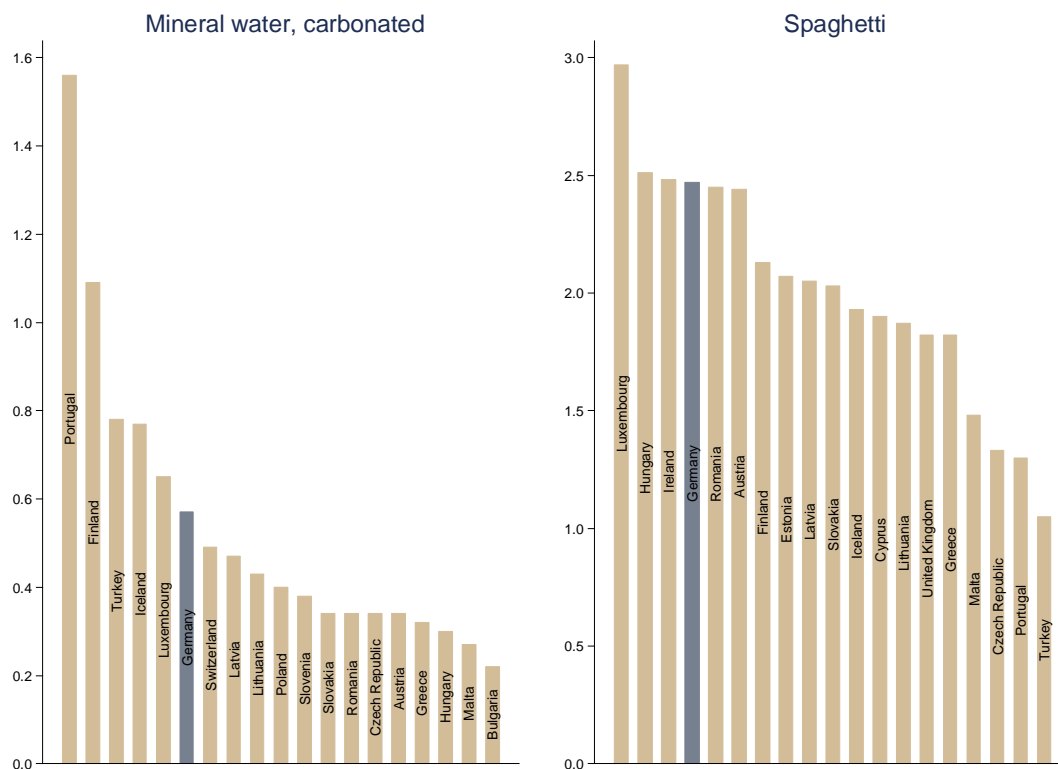


Figure 9: Cross country price comparisons for 2009 based on DAPs data



Source: E.CA Economics based on DAPs data.

Figure 10: Cross country price comparisons for 2008 based on DAPs data



Source: E.CA Economics based on DAPs data.

## About E.CA Economics

E.CA Economics is working on central topics in the field of competition policy and regulation. These include case-related work on European competition matters, e.g. merger, antitrust or state aid cases, economic analysis within regulatory procedures and studies for international organizations on competition policy issues. E.CA Economics applies rigorous economic thinking with a unique combination of creativity and robustness, in order to meet the highest quality standards of international clients.

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## About ESMT

**ESMT European School of Management and Technology** was founded in October 2002 on the initiative of 25 leading German companies and associations with the aim of establishing an international management school with a distinctly European focus. ESMT provides executive education and offers an international full-time MBA program, as well as an Executive MBA. ESMT is located in Berlin with further campuses in Munich and Cologne. As a private institution of higher education, ESMT is fully accredited by German authorities.

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