## PRICE LEVEL DIFFERENCES IN THE EURO AREA: THE CASE OF GREECE

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#### ABSTRACT

Recent inflationary pressures have significantly affected household disposable incomes across Europe, with Greece being particularly impacted due to its low purchasing power. This study investigates the persistence and evolution of price level differences for fast-moving consumer goods in Greece compared to other euro area countries. It utilises the results of Dixon et al. (2023), who analysed price level differences across 41 product categories in ten euro area countries and found that the main factors contributing to price level differences include producer market competition, retail market structure, local costs and consumer habits. Building on these findings, we construct counterfactual prices and show that aligning Greece's market structures and consumer behaviour patterns with the euro area average could significantly reduce prices (by 17 percentage points on average for the products with the highest share in total sales). The study also finds that although Greece has become cheaper in relative terms in recent years, it is still, on average, about 10% more expensive compared to euro area countries' average. These results imply that there is scope for policy action, in particular, in areas that increase competition among producers, improve the structure of the retail market and enhance consumer economic literacy.

Keywords: market structure; consumer behaviour; international relative prices

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ENNAA

## ΔΙΑΦΟΡΕΣ ΣΤΑ ΕΠΙΠΕΔΑ ΤΙΜΩΝ ΣΤΗΝ ΕΥΡΩΖΩΝΗ: ΤΟ ΠΑΡΑΔΕΙΓΜΑ ΤΗΣ ΕΛΛΑΔΟΣ

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#### ΠΕΡΙΛΗΨΗ

Οι πληθωριστικές πιέσεις των τελευταίων ετών έχουν επηρεάσει σημαντικά το διαθέσιμο εισόδημα των νοικοκυριών, καθώς μείωσαν σε μεγάλο βαθμό την αγοραστική τους δύναμη. Πέραν του πληθωρισμού, ωστόσο, το ενδιαφέρον επικεντρώνεται και στις διαφορές των τιμών μεταξύ των χωρών της ευρωζώνης, οι οποίες εξακολουθούν να είναι σημαντικές, παρά την απουσία εμπορικών περιορισμών και την εξάλειψη των διακυμάνσεων των συναλλαγματικών ισοτιμιών, ενώ διάφορες έρευνες καταδεικνύουν ότι η Ελλάδα είναι μεταξύ των ακριβότερων χωρών σε αγαθά όπως το βρεφικό γάλα και τα απορρυπαντικά πλυντηρίου ρούχων.

Η παφούσα μελέτη εφευνά την εξέλιξη και την επιμονή των διαφοφών των τιμών, εστιάζοντας σε 41 κατηγοφίες επώνυμων τυποποιημένων πφοϊόντων σουπεφμάφκετ για 10 χώφες της ευφωζώνης, με έμφαση στις διαφοφές των τιμών για την Ελλάδα. Η μελέτη μας βασίζεται στα αποτελέσματα των Dixon et al. (2023), σύμφωνα με τα οποία οι κύφιοι παφάγοντες που συμβάλλουν στη διαφοφοποίηση του επιπέδου των τιμών μεταξύ των χωφών είναι ο ανταγωνισμός σε επίπεδο παφαγωγού, η δομή της αγοφάς λιανικής και οι συνήθειες των καταναλωτών.

Με βάση τα παφαπάνω αποτελέσματα, στην παφούσα μελέτη κατασκευάζονται υποθετικές τιμές (counterfactual prices) για τα πφοϊόντα που μελετώνται. Το βασικό εύφημα είναι ότι η εξομοίωση της δομής της ελληνικής αγοφάς και της συμπεφιφοφάς των καταναλωτών στην Ελλάδα με τα αντίστοιχα επίπεδα της ευφωζώνης θα οδηγούσε σε σημαντικές μειώσεις στις διαφοφές των τιμών, οι οποίες για τα πφοϊόντα με τις υψηλότεφες πωλήσεις θα μποφούσαν να φθάσουν έως και τις 17 ποσοστιαίες μονάδες κατά μέσο όφο. Από τη μελέτη πφοκύπτει επίσης ότι τα τελευταία χφόνια στην Ελλάδα έχει επιτευχθεί αξιοσημείωτη πφόοδος, καθώς οι διαφοφές των τιμών έχουν μειωθεί σημαντικά, αλλά παφαμένουν σε υψηλότεφα επίπεδα σε σύγκριση με την ευφωζώνη (κατά μέσο όφο πεφίπου 10%). Συνεπώς, υπάφχει δυνατότητα πεφαιτέφω βελτίωσης με παφεμβάσεις οι οποίες αυξάνουν τον ανταγωνισμό μεταξύ των παφαγωγών, επιφέφουν αλλαγές στη δομή της αγοφάς λιανικής και – σε μακφοπφόθεσμο οφίζοντα – στοχεύουν στην ενίσχυση του καταναλωτικού αλφαβητισμού.



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#### **I** INTRODUCTION

Recent inflation developments have put pressure on household disposable income in Europe. The erosion of purchasing power has become particularly acute for countries with low disposable income such as Greece, which, in purchasing power parity (PPP) terms, is one of the poorest countries in the European Union (EU).<sup>1</sup> Public discussion in Greece has recently focused on price level differences in similar goods across European countries following recent findings by the Hellenic Competition Authority, indicating that Greece is among the most expensive countries for baby food and laundry detergents. Recent developments have also prompted EU-level demands to crack down on multinational companies that force retailers to pay highly different prices for the same branded product, as well as demands to further deepen the European Single Market in order to protect consumers and their income.

In economic theory, the law of one price (LOP) suggests that "a good must sell for the same price in all locations". However, deviations from the LOP have been found to be significant and persistent over time.<sup>2</sup> Even within the euro area, which does not have any internal barriers to trade and where exchange rate fluctuations have been eliminated, empirical

evidence suggests that while price dispersion across countries has decreased over time, it still remains significant.<sup>3</sup>

There are several underpinnings as to why the price levels of the same product may differ, such as transport costs (Dumas 1992), imperfect competition and pricing-to-market effects (Krugman 1987), and productivity differences between traded and non-traded goods (Balassa 1964; Samuelson 1964). Non-traded input costs have also been found to be important determinants of international price differences (Crucini et al. 2005). More recent studies consider consumer behaviour as an additional factor that may determine international price differences. For instance, Alessandria and Kaboski (2011) emphasise search frictions as a source of market power and pricing-tomarket.

In this article, we utilise the results of Dixon et al. (2023), who analyse price level differences in 41 product categories of fast-moving

**<sup>3</sup>** See Goldberg and Verboven (2004), Engel and Rogers (2004), Berlingieri et al. (2018), Reiff and Rumler (2014), Dixon et al. (2023).



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See Eurostat, "Purchasing power parities and GDP per capita – flash estimate – Statistics Explained".

<sup>2</sup> See for example Isard (1977), Haskel and Wolf (2001), Lach (2002), Anderson and van Wincoop (2004).

consumer goods across ten euro area countries. In their study, they find that producer market competition, retail market concentration, local costs (such as wages and rents) and consumer habits explain a significant part (about 40%) of branded product price differences across countries.

Based on their empirical results, we construct counterfactual prices for those 41 product categories. Specifically, we investigate what prices for branded goods could be in Greece if the above-mentioned explanatory variables were set at the euro area average. We find that for Greece the prices of most goods included in the analysis could be significantly reduced, by up to 48 percentage points. Moreover, we update the price level data at the product level up to 2023 using inflation developments at the COICOP 5 level as an approximation.<sup>4</sup>

The results reveal that while Greece has become cheaper over the past decade compared to the euro area, it remains one of the most expensive countries for branded fastmoving consumer goods. We show that prices in Greece could be significantly lower if producer and retail market characteristics, as well as consumer preferences were aligned with the euro area average. This result holds across most products. In fact, for many products, adjusting the explanatory variables to the euro area average would make Greece significantly cheaper than the euro area average. Significant reductions in branded fast-moving consumer goods can be obtained by increasing competition in the producer market, as well as by improving the structure of the retail market. Specifically, the retail market would need to be more competitive across retailers at the local level towards the consumer, but also more concentrated when buying goods from the producers in order to counteract their monopolistic power. Finally, in the long run, educating consumers, i.e. improving economic literacy, would also contribute significantly to reducing price differentials with the euro area.

#### 2 WHAT DO PRICE LEVEL DIFFERENCES DEPEND ON

#### 2.1 THE DIXON ET AL. (2023) STUDY

Dixon et al. (2023) analyse price level differences in 41 product categories of fast-moving consumer goods across 58 regions in ten euro area countries. They use a large and highly disaggregated dataset of retail prices and quantities from A.C. Nielsen market research (Nielsen), covering the period from January 2009 to October 2011.<sup>5</sup> Within each product category, they employ unit prices and quantities for four brands and private labels, which on average cover 80% of total sales in each category.<sup>6</sup>

The authors show that price dispersion across countries is about ten times higher than price dispersion within countries, indicating that price differences in similar products are significantly larger across countries than within countries. On balance, they find that Greece and Ireland were among the most expensive countries, while Spain and Germany among the cheapest.

Moreover, in order to account for quality differences that may be a determinant of price differences, they also compare unit prices of market leaders across locations and countries, the rationale being that market leaders, by definition, tend to have a broad consumption base and be characterised by good quality. They



<sup>4</sup> The Classification of Individual Consumption by Purpose, abbreviated as COICOP, is a classification developed by the United Nations Statistics Division to classify individual consumption expenditures and was adapted to the compilation of the harmonised index of consumer prices (HICP) of the European Union (EU) and the euro area.

<sup>5</sup> The product categories in Dixon et al. (2023) are: 100% juice, diapers, ground coffee, instant coffee, all purpose cleaners, automatic dishwasher detergent, baby food, beer, butter, cat food, cereals, condoms, carbonated soft drinks, deodorant, dog food, dry pasta, fabric softener, frozen fish, ice cream, strawberry jam, laundry detergent, margarine, refrigerated milk, UHT milk, olive oil, pantyliners, paper towels, frozen peas, rice, shampoo, shaving preps, sugar, tinned peas, tinned tuna, toilet tissue, toothpaste, vodka, sparkling water, still water, wet soups, whiskey. The countries included in the analysis are: Austria (AT), Belgium (BE), Germany (DE), Spain (ES), France (FR), Greece (GR), Ireland (IE), Italy (IT), the Netherlands (NL) and Portugal (PT).

<sup>6</sup> This would imply that the markets in these product categories are better characterised as oligopolistic markets.

offer, in consumers' eyes, reasonable "value for money" within each country. Indeed, for many product categories, market leaders tend to be the same producers offering the same base products - for example, Barilla in the product category of dry pasta. In this respect, quality differences are minimised.7 In order to view the full range of price dispersion, they compare the time-averaged minimum and maximum unit value prices of market leaders (within each product category) across euro area countries. They show that there are very large differences in prices, indicating strong "pricing-to-market" effects as, on average, for the 41 product categories, the mean and the median price difference is a full 220% and 181%, respectively. Finally, they also show that there are significant differences across countries for the same product (for example Coca Cola or Lenor fabric softener).

#### 2.2 THE MAIN DRIVERS OF PRICE DIFFERENCES

In their study, Dixon et al. (2023) set up an empirical estimation model, where the price of a branded product (j) in location (i) depends on: 1) competition characteristics on the producer side; 2) competition characteristics in the retail sector; 3) consumer habits; and 4) other variables such as VAT rates, rents, wages, local unemployment rate, local GDP per capita, etc.

In order to capture the competition characteristics in each location on the producer side, the following variables are included:

- The quantity share of the market leader. A higher share of the market leader in a given product category would imply higher monopoly power and higher mark-ups, that is higher prices.
- The quantity share of other brands, which would capture the strength of competition towards the market leader. A higher share of other brands would imply lower prices.
- The quantity share of private labels, which would capture competition from non-

branded goods. This would also have a downward effect on the prices of branded goods that consumers face.

The variables included in the characteristics of the retail market take the form of a Herfindahl-Hirschman index (HHI) that measures concentration. When assessing the market power of retailers, it is important to account not only for downstream market competition (i.e. with respect to consumers), but also for upstream market competition (i.e. with respect to producers, "buying power" of retailers), as the latter will determine significantly the price at which the retailer buys the product from the producer.<sup>8,9</sup> Specifically, for the consumer at the local level (usually within a 5 kilometre radius), it is important that retailers face competition. This means that the consumer has several local options to buy goods from. As to retail concentration towards the producer, it is important that retailers form buying groups. By doing so, they can place larger orders, acting as a "monopsonist" towards the producer, and can, therefore, obtain better prices.<sup>10</sup> This is of particular importance when producers are large multinationals with significant market shares in many countries and in many product categories within each country. For this purpose, local (5 km radius) and regional HHI indices are used to measure:11

Retail concentration towards the consumer

 downstream competition. Increased concentration towards the consumer would

- **9** Several companies may form a buying group when making purchases in order to obtain more favourable prices from manufacturers, due to bulk. For the effects on prices, see Ciapanna and Colonna (2011), ECB (2011) and Corstjens (2022).
- 10 Retail alliances are horizontal alliances of retailers, retail groups or retail chains, aiming at creating a degree of buying power visà-vis producers, thus allowing retailers to negotiate lower prices with them. Recent studies find that retail alliances may lead to significant declines in prices, e.g. Corstjens (2022).
- 11 These indices have been calculated from a unique dataset encompassing the exact location of over 100,000 individual grocery stores across the euro area for 2010. The indices were compiled for the purposes of the analysis in ECB (2011), op. cit. in footnote 8.



<sup>7</sup> On average, market leaders are about 4% more expensive than the non-leading brands.

<sup>8</sup> For an analysis of alternative measures of retail market competition, see ECB (2011), "Structural features of distributive trades and their impact on prices in the euro area", Report of the Task Force of the Monetary Policy Committee of the ESCB, Occasional Paper No. 128.

imply lower local competition and hence higher prices.

Retail concentration towards the producer

 upstream competition. Increased concentration towards the producer would imply higher monopsony power for retailers and hence lower prices.

For the variables capturing consumer habits, two variables are derived:

- One variable measures what we call consumption intensity, calculated as the number of units sold per person per month in a location. A priori, higher consumption intensity is associated with lower prices, as consumers will spend more time researching the market if they consider the product to be important and spend on it a relatively higher share of their disposable income. One could view this variable as measuring search costs at the product level.
- The second measure is based on the average pack size and captures the preferences of consumers for certain pack sizes. While in general the larger the pack size the lower unit prices tend to be, it is still the choice of the consumer what pack size to buy (provided that larger pack sizes do exist). One could view this variable as a consumer trait indicating some type of inattention, which will enable firms to set higher prices. Thus, larger pack sizes are associated with lower prices.

Finally, there are several additional variables capturing wage and rent costs, unemployment, VAT levels and promotions/sales.

All prices and explanatory variables are expressed in relative terms and in particular relative to the median price location. Specifically, the authors find the location with the median price for each product and obtain the relevant characteristics of all aforementioned variables in this median price location. They then express prices and all their explanatory variables (in all other locations) in relative terms.

#### Table I Empirical estimates: euro area

Variable	Effect of a 10% increase on relative price
Share of market leader	+0.5%
Share of other brands	-0.7%
Share of private labels	-0.2%
Average pack size	-4.5%
Consumption intensity	-0.6%
Retail concentration (towards consumer)	+3.3%
Retail concentration (towards producer)	-4.5%
D: 1 (2022)	

Source: Dixon et al. (2023).

Note: The effects are based on results in Table 4 of Dixon et al. (2023).

Their main results for the euro area are summarised in Table 1. All variables have the expected sign. An increase in the monopoly power of the producer, captured by the share of the market leader, raises prices, while higher competition from other producers, captured by the share of other brands and private labels, reduces prices. As regards consumer habits, an increase in the average pack size and consumption intensity reduces prices. Finally, as regards the retail market structure, an increase in concentration towards consumers, i.e. lower local competition, raises prices, while an increase in concentration towards producers, i.e. higher monopsony power, reduces prices.

What do these results imply for Greece and the prices Greek consumers face? Greece tends, on average, to be characterised by a higher share of the market leader and low private label penetration. This implies higher monopoly power of the producer and less producer market competition. For many products, consumption intensity is lower and consumers purchase smaller pack sizes compared with the euro area average. Finally, with regard to retail concentration, Greece exhibits higher local concentration towards the consumer and lower concentration towards the producer, with both factors implying higher prices.



#### 3 COUNTERFACTUALS: ADJUSTING GREECE TO BEING AVERAGE

The above results are averages across all products and apply to the euro area as a whole. However, we can use them to produce some counterfactuals. For example, if we take the products in which Greece is the most expensive across all euro area countries, such as ground coffee, butter, margarine, UHT milk, paper towels, toilet tissue, toothpaste and sparkling water, we can investigate to what extent these high prices depend on differences in our explanatory variables.

Specifically, we can observe the magnitude of each explanatory variable for each product, as well as the product-specific average of each explanatory variable across euro area countries (see Tables A-F in Dixon et al. 2023). For instance, we observe the share of the market leader in the product category of ground coffee for Greece and calculate the respective euro area average. We then calculate the percentage difference between the Greek value of the respective variable and the euro area average and multiply it by the coefficient for each variable obtained by the regressions. This would give us a counterfactual price for these products in Greece, i.e. what prices would be if Greece stood at the euro area average for each explanatory variable. Each explanatory variable has a product-specific dimension except for the retail market structure, which is common for all products.

Table 2 shows for example that the price of ground coffee in Greece is 50% above the euro area average. If we adjust the market structure of producers to match the euro area average, this would reduce price differences by 7%. Moreover, if Greek consumers consumed as much ground coffee as in the euro area and bought similar (larger) pack sizes, price differences would be reduced by another 15%. Finally, if the retail market structure in Greece, both downstream towards the consumer (higher local competition) and upstream towards the producer (higher bargaining power of retailers), were similar to that of the euro area, average price differences would be further reduced by 13%. The remaining price difference of 15%, i.e. the price difference that could not be explained on the basis of this exercise if Greece had converged to the euro area average, is significantly smaller than the original 50%. Indeed, for all products the potential reduction of price differences in Greece is

# Table 2 Counterfactual price differences: the effect of adjusting Greece to the euro area average on the prices of the most expensive products

	Observed price difference from the euro area average	Market leader effect	OB effect	PL effect	Pack size effect	Consu- mption intensity effect	Retail concentra- tion effect	Model implied change	Final net price difference
Ground coffee	50%	-7%	1%	-1%	-10%	-5%	-13%	-35%	15%
Butter	54%	-7%	2%	-2%	0%	-5%	-13%	-25%	29%
Margarine	60%	-2%	-2%	-2%	-2%	-2%	-13%	-23%	36%
UHT milk	56%	-4%	6%	-1%	-7%	-6%	-13%	-25%	32%
Paper towels	100%	4%	2%	0%	-21%	-3%	-13%	-31%	68%
Toilet tissue	25%	-7%	1%	0%	-7%	-2%	-13%	-28%	-4%
Toothpaste	16%	-2%	1%	-2%	-5%	-3%	-13%	-24%	-8%
Sparkling water	129%	-5%	0%	-2%	-22%	-6%	-13%	-48%	81%
Average	61%	-4%	1%	-1%	-9%	-4%	-13%	-30%	31%

Source: Authors' calculations based on results in Table 4 and information from Table 2 and Tables A-F of Dixon et al. (2023). Note: OB = other brands, PL = private labels.



# Table 3 Counterfactual price differences: the effect of adjusting Greece to the euro area average on the prices of the products with the highest sales

	Observed price difference from the euro area	Market leader	OB	PL	Pack size	Consu- mption intensity	Retail concentra- tion effect	Model implied change	Final net price difference
Refrigerated milk	-8%	20%	0%	-1%	20%	1%	-13%	-9%	-16%
Carbonated soft drinks	15%	-2%	3%	-1%	-11%	-4%	-13%	-28%	-12%
Olive oil	-24%	0%	0%	-1%	48%	3%	-13%	37%	14%
Beer	0%	-4%	1%	2%	-18%	-5%	-13%	-37%	-36%
Toilet tissue	25%	-7%	1%	0%	-7%	-2%	-13%	-28%	-4%
Instant coffee	17%	-9%	-4%	-2%	-8%	3%	-13%	-33%	-15%
Whiskey	7%	-4%	24%	-1%	1%	-2%	-13%	5%	12%
Diapers	-4%	-1%	-5%	-1%	-5%	-1%	-13%	-26%	-29%
Cereals	15%	-14%	1%	-1%	-4%	-2%	-13%	-33%	-18%
100% juice	0%	-4%	-11%	-1%	-8%	-2%	-13%	-39%	-39%
Shampoo	-13%	-7%	-1%	0%	19%	1%	-13%	-1%	-14%
Average	3%	-4%	1%	-1%	1%	-1%	-13%	-17%	-14%
Average excl. olive oil	5%	-5%	1%	-1%	-4%	-1%	-13%	-23%	-17%

Source: Authors' calculations based on results in Table 4 and information from Table 2 and Tables A-F of Dixon et al. (2023). Note: OB = other brands, PL = private labels.

significant, with sparkling water accounting for the largest reduction, namely 48 percentage points. On average, for the products presented in Table 2, the price difference would be reduced by half, from 61% to 31%.<sup>12</sup> It appears that improving producer market competition would lead to lower price differences vis-à-vis the euro area. However, a significant reduction in price differences would also come from improvements in the structure of the retail market, by increasing both local competition towards the consumer and retailers' bargaining power towards producers, e.g. through retail buying alliances. Finally, lower price differences could also originate from potential changes in consumer behaviour.

While the potential reduction of price differences in Table 2 is large, the reason for this could be that the products in which Greece is the most expensive across euro area countries are not the most representative ones from the consumer's point of view. To this end, we conduct a similar counterfactual exercise, focusing on a set of products with the highest shares in total sales in Greece, which is more representative of the actual Greek consumption basket. The results for the eleven product categories with the highest shares in total sales are presented in Table 3.<sup>13</sup> The table reports the observed price differences between Greece and the euro area average (second column), as well as how prices would be affected if Greece stood at the euro area average for each explanatory variable (third to eighth column).<sup>14</sup> We can draw four main conclusions from Table 3.

*First*, we can see that observed price differences between Greece and the euro area are now significantly smaller on average (only 3%,

14 Averages refer to the products included in Table 3.



<sup>12</sup> Referring to the averages of the explanatory variables for the eight products presented in the table.

**<sup>13</sup>** These eleven product categories account for about 70% of total sales in Greece in the product categories included in the sample of Dixon et al. (2023).

or 5% excluding olive oil) as, depending on the product, price differences could be both significantly smaller and larger compared with the euro area average.

Second, as regards products that are more expensive, e.g. carbonated soft drinks, instant coffee, toilet tissue and cereals, prices could be 28%-33% lower if producer and retail market characteristics, as well as consumer preferences were aligned with the euro area averages (see Table 3, column "Model implied change"). Adjusting the explanatory variables to the euro area average would not only fully eliminate any price differences, but would also make these products even cheaper than in the euro area. Overall, adjusting the explanatory variables to the euro area average would make Greece 14% cheaper relative to the euro area.

Third, consumer habits play an important role in determining the price of some products. Adjusting consumer habits, such as the preferred pack size, to those of the average euro area consumer could, in some cases, lead to price increases instead of price declines. Olive oil is such an example. Our results in Table 3 suggest that the relative price of olive oil in Greece would increase by 37% if producer and retail market characteristics, as well as consumer preferences were aligned with the euro area averages. This is mainly because olive oil in Greece is typically bought in much larger pack sizes compared to the euro area and, hence, adjusting the pack size to the euro area average would lead to significant increases in prices.

Fourth, our results in Table 3 suggest that, on average, the largest part of the decline in prices after adjusting Greece to the euro area average comes from the market leader effect and the retail concentration effect. Overall, improving the market structure in Greece towards the euro area average would lower prices by 17% on average for the eleven product categories with the highest shares in the consumer basket (see Table 3, second row from the bottom). Most of this decline (13%) would come from improving the structure of the retail market, both towards the consumer and towards producers. The decline in prices would, on average, be larger (23%) if we excluded olive oil (see Table 3, last row).

#### 4 PRICE LEVELS NOW AND THEN

In order to get an idea of where Greece would stand today in terms of price differences, we perform a simple extrapolation of the unit prices of the products included in Dixon et al. (2023) using COICOP 5 price developments. In particular, we match the products in the Dixon et al. (2023) study to the relevant COICOP 5 index.<sup>15</sup> We then approximate the current average price of the product using the cumulative annual rate of change in the relevant COICOP 5 index.<sup>16</sup> We approximate therefore an implied price level in order to assess recent developments.

If we focus on the products in which Greece was the most expensive across euro area countries, i.e. ground coffee, butter, margarine, UHT milk, paper towels, toilet tissue, toothpaste and sparkling water, we see that Greece still ranks high (see Chart 1). However, it does not seem to be any more the most expensive country for all of these product categories, while for selected products the price difference with other countries has narrowed. Rather, there is now a clustering of implied prices at more similar values in products such as toothpaste, margarine, UHT milk and toilet tissue. A similar conclusion can be reached when focusing on the products with the highest sales (see Chart 2).

The picture emerging from the selected products presented in Charts 1 and 2 is further corroborated in Table 4. Table 4 shows the relative change over time in the examined countries' positions vis-à-vis the euro area average. For example, Austrian (AT) prices relative to

<sup>16</sup> If the COICOP 5 index is not available for some time period, we approximate developments by the relevant COICOP 4 index.



**<sup>15</sup>** See Table A1 in the Appendix.



#### Chart I Prices of the most expensive products in selected euro area countries (2011, 2023)





FR GR IT NL PT



Source: Authors' calculations based on data from Eurostat and Dixon et al. (2023). Note: For unit equivalence, see Table A1 in the Appendix.



## REFERENCES



Source: Authors' calculations based on data from Eurostat and Dixon et al. (2023). Note: For unit equivalence, see Table A1 in the Appendix.

### Table 4 Change in relative prices vis-à-vis the euro area average between 2011 and 2023

Country	All products	Food	Beverages	Other
Austria	6%	4%	12%	3%
Belgium	7%	5%	8%	8%
Germany	9%	12%	1%	10%
Spain	5%	8%	2%	4%
France	-3%	-7%	-3%	3%
Greece	-8%	-10%	-7%	-8%
Ireland	-24%	-26%	-18%	-26%
Italy	-2%	0%	-4%	-4%
Netherlands	5%	4%	8%	3%
Portugal	2%	4%	7%	-3%

Source: Authors' calculations based on data from Eurostat and Dixon et al. (2023).





(EUR per unit)

#### Chart 2 Prices of products with the highest sales in selected euro area countries (2011, 2023)











Source: Authors' calculations based on data from Eurostat and Dixon et al. (2023). Note: For unit equivalence, see Table A1 in the Appendix.





# Chart 2 Prices of products with the highest sales in selected euro area countries (2011, 2023) (continued)

the euro area average have increased by 6% in 2023 compared to 2011. In other words, Austrian prices have increased more than the euro area average for these goods. In the same vein, Greece has, on average, become relatively cheaper and particularly in the food products category (see Table 4 and Chart 3). While Greece seems to have outperformed other countries, it has not experienced the remarkable adjustment of Ireland, which, together with Greece, appeared in Dixon et al. (2023) to be among the most expensive countries. Finally, Germany and Spain, which appeared to be among the cheapest countries, have now reduced their relative distance from the euro area average and have become relatively more expensive compared to 2011.<sup>17</sup>

Combining the messages emerging from Table 4 and Charts 1, 2 and 3 suggests that even though, on average, Greece has become cheaper

<sup>17</sup> See Table A2 in the Appendix for the average relative differences of all countries in the sample between 2011 and 2023.







in relative terms vis-à-vis the euro area in recent years, it has not yet covered the entire distance, as it remains a rather expensive country in many product categories. Furthermore, our implied extrapolated prices could be interpreted as indicating that significant price differences persist in the euro area despite the observed convergence illustrated in Table 4. Therefore, the forces underlying these price differences are still at play and policy action may be required in order to exploit the full potential of the single market.

#### **5 OTHER PRICES**

Apart from fast-moving consumer goods, there is of course a range of products that are important to consumers, such as unprocessed food, services and rents. In order to obtain a picture about the relative prices facing the Greek consumer, we turn to a database called <u>Numbeo</u>. The Numbeo database contains information about the prices of 55 standard items, which reflect the cost of living in over 11,500 cities worldwide. The data collection process involves a combination of user-provided input and information gathered by Numbeo's team from reliable sources, including government institutions and supermarket websites.

The final, publicly available, dataset provides information on the minimum, maximum and average prices over the past twelve months for each item in the database. Numbeo classifies the 55 available items into ten broad categories: restaurants; markets; transportation; utilities (monthly); sports and leisure; childcare; clothing and shoes; rent per month; buy apartment price; and salaries and financing.<sup>18</sup>

The current analysis uses data as of January 2024 for 134 cities from all 20 euro area countries. The sample includes four cities from Greece: Athens; Thessaloniki; Heraklion; and Larissa.

18 To ensure data quality, Numbeo uses various methods. It applies automatic and semi-automatic algorithms to reduce noise in the collected data, it assigns three times more weight to the information collected from reliable sources and it blocks IP addresses that are identified as spammers. Finally, Numbeo regularly removes incorrect data using existing data as a benchmark.



Source: Authors' calculations based on data from Eurostat and Dixon et al. (2023). Note: The relative price differences are simple averages across products.

#### Chart 4 High-priced products



Note: Red markers depict the four Greek cities included in the database (Athens, Thessaloniki, Heraklion, Larissa).



Source: Numbeo, January 2024. Note: Red markers depict the four Greek cities included in the database (Athens, Thessaloniki, Heraklion, Larissa).





#### Chart\_6\_Low-priced products

(EUR)

Note: Red markers depict the four Greek cities included in the database (Athens, Thessaloniki, Heraklion, Larissa).

Based on Numbeo's data, the analysis shows that Greek cities belong to the group of cities with the lowest prices for about half of the database's items. Such items are mostly unprocessed food (fresh fruits and vegetables, as well as unprocessed meat) such as tomatoes, potatoes, oranges, apples and beef, among other things. By contrast, for about 13% of the items, Greek cities are among those with the highest prices. Examples include supermarket items such as bottle of wine, domestic beer and eggs, as well as served coffee. Finally, for about 30% of the items, Greek cities cluster in the middle of the price range scale. This holds for items in the clothing category, as well as some processed food items such as chicken fillets and local cheese.

Charts 4, 5 and 6 show some representative examples of cities' ranking for various items. The vertical lines depict the range of prices and the yellow dots their average values. Red markers denote the four Greek cities. On balance, while Greece is among countries with the lowest prices for a large share of other products, these refer mostly to locally produced goods or services. In this respect, small local producers may not follow the same pricing strategies as in the case of most fast-moving consumer goods that are produced by large multinational corporations.

#### **6** CONCLUSIONS

In this article, we analyse price level differences between Greece and the euro area in 41 product categories of fast-moving consumer goods based on the estimates of Dixon et al. (2023), who find that producer market competition, retail market concentration and consumer habits explain a significant part of price differences across countries. In particular, we investigate what prices for branded goods could be in Greece if the above-mentioned explanatory variables were set at the respective euro area average.



We show that prices in Greece could be significantly lower if producer and retail market characteristics, as well as consumer preferences were aligned with the euro area average. This result holds across most products. For the goods in which Greece was the most expensive country, price reductions could reach 30% on average. Significant reductions could also be achieved for the set of goods with the highest shares in total sales, which are more representative for the Greek consumer basket. Specifically, for this set of goods, reductions of 17% on average (23%, if olive oil is excluded) could be obtained.

Our results further show that while Greece has become cheaper over the past decade compared to the euro area, it remains one of the most expensive countries for branded fastmoving consumer goods, implying that there is scope for policy interventions in order to further reduce prices in Greece in the fast-moving consumer goods segment. For many years, policy discussions have focused on the importance of interventions to improve competition on the producer side, and recently on interventions that would reduce the pricing power of multinationals. Our results confirm this viewpoint, with price reductions reaching up to 14% through enhanced competition in the producer market towards the euro area average. However, there are additional areas on which policy should also focus.

In particular, improving the structure of the retail market, on the one hand, by increasing local competition and, on the other hand, by providing incentives for retailers to form buying groups —with a view to tackling the oligopolistic power of multinational producers — could significantly reduce observed price differentials. Finally, in the long term, educating consumers, i.e. improving economic literacy, would also contribute to reduced price differentials with the euro area and provide significant benefits for them.



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# **APPENDIX**

## Table AI Correspondence table, products and COICOP

Product	Unit equivalent	COICOP 5 code	COICOP 5 code description	COICOP 4 code	COICOP 4 code description
100% juice	L	01223	Fruit and vegetable juices	0122	Mineral waters, soft drinks, fruit and vegetable juices
Diapers	PIECE	12132	Articles for personal hygiene and wellness, esoteric products and beauty products	1213	Other appliances, articles and products for personal care
Ground coffee	KG	01211	Coffee	0121	Coffee, tea and cocoa
Instant coffee	KG	01211	Coffee	0121	Coffee, tea and cocoa
All purpose cleaners	L	05611	Cleaning and maintenance products	0561	Non-durable household goods
Automatic dishwasher detergent	KG	05611	Cleaning and maintenance products	0561	Non-durable household goods
Baby food	KG	01193	Baby food	0119	Food products n.e.c.
Beer	L	02131	Lager beer	0213	Beer
Butter	KG	01151	Butter	0115	Oils and fats
Cat food	KG	09342	Products for pets	0934	Pets and related products
Cereals	KG	01117	Breakfast cereals	0111	Bread and cereal
Condoms	PIECE	06121	Pregnancy tests and mechanical contraceptive devices	0612	Other medical products
Carbonated soft drinks	L	01222	Soft drinks	0122	Mineral waters, soft drinks, fruit and vegetable juices
Deodorant	L	12132	Articles for personal hygiene and wellness, esoteric products and beauty products	1213	Other appliances, articles and products for personal care
Dog food	KG	09342	Products for pets	0934	Pets and related products
Dry pasta	KG	01116	Pasta products and couscous	0111	Bread and cereal
Fabric softener	L	05611	Cleaning and maintenance products	0561	Non-durable household goods
Frozen fish	KG	01132	Frozen fish	0113	Fish and seafood
Ice cream	L	01185	Edible ices and ice cream	0118	Sugar, jam, honey, chocolate and confectionery
Strawberry jam	KG	01182	Jams, marmalades and honey	0118	Sugar, jam, honey, chocolate and confectionery
Laundry detergent	KG/L	05611	Cleaning and maintenance products	0561	Non-durable household goods
Margarine	KG	01152	Margarine and other vegetable fats	0115	Oils and fats
Refrigerated milk	L	01141	Fresh whole milk	0114	Milk, cheese and eggs
UHT milk	L	01143	Preserved milk	0114	Milk, cheese and eggs
Olive oil	L	01153	Olive oil	0115	Oils and fats
Pantyliners	PIECE	12132	Articles for personal hygiene and wellness, esoteric products and beauty products	1213	Other appliances, articles and products for personal care
Paper towels	ROLL	05612	Other non-durable small household articles	0561	Non-durable household goods
Frozen peas	KG	01172	Frozen vegetables other than potatoes and other tubers	0117	Vegetables
Rice	KG	01111	Rice	0111	Bread and cereal
Shampoo	L	12132	Articles for personal hygiene and wellness, esoteric products and beauty products	1213	Other appliances, articles and products for personal care
Shaving preps	L/PACK	12132	Articles for personal hygiene and wellness, esoteric products and beauty products	1213	Other appliances, articles and products for personal care



## Table AI Correspondence table, products and COICOP

### (continued)

Product	Unit equivalent	COICOP 5 code	COICOP 5 code description	COICOP 4 code	COICOP 4 code description
Sugar	KG	01181	Sugar	0118	Sugar, jam, honey, chocolate and confectionery
Tinned peas	KG	01194	Ready-made meals	0119	Food products n.e.c.
Tinned tuna	KG	01136	Other preserved or processed fish and seafood and fish and seafood preparations	0113	Fish and seafood
Toilet tissue	ROLL	05612	Other non-durable small household articles	0561	Non-durable household goods
Toothpaste	L	12132	Articles for personal hygiene and wellness, esoteric products and beauty products	1213	Other appliances, articles and products for personal care
Vodka	L	02111	Spirits and liqueurs	0211	Spirits
Sparkling water	L	01221	Mineral or spring waters	0122	Mineral waters, soft drinks, fruit and vegetable juices
Still water	L	01221	Mineral or spring waters	0122	Mineral waters, soft drinks, fruit and vegetable juices
Wet soups	KG/L	01194	Ready-made meals	0119	Food products n.e.c.
Whiskey	L	02111	Spirits and liqueurs	0211	Spirits

### Table A2 Relative price differences from the euro area average in 2011 and 2023

	2011	2023	2011	2023	2011	2023	2011	2023
Country	Total		Food		Beverages		Other	
Austria	-2%	3%	3%	7%	-11%	1%	-3%	0%
Belgium	11%	18%	24%	29%	5%	12%	1%	9%
Germany	-10%	-2%	-12%	0%	-17%	-16%	-4%	5%
Spain	-12%	-7%	-1%	7%	-22%	-20%	-18%	-14%
France	-4%	-7%	-4%	-11%	-6%	-9%	-4%	0%
Greece	19%	10%	21%	12%	20%	13%	15%	7%
Ireland	26%	2%	16%	-10%	58%	40%	12%	-14%
Italy	-1%	-3%	3%	3%	-14%	-18%	4%	1%
Netherlands	-14%	-9%	-25%	-21%	-5%	3%	1%	5%
Portugal	-13%	-11%	-25%	-21%	-20%	-13%	4%	2%

Source: Authors' calculations based on data from Eurostat and Dixon et al. (2023). Note: The relative price differences are simple averages across products.

