

Whom does inflation hurt most?

HIGHLIGHTS

- The European Union is experiencing a rapid increase in inflation rates fuelled by energy prices and the war in Ukraine. The impact of the price increase is not equally distributed.
- In 8 out of 17 countries, lower-income groups whose consumption basket is mainly composed of essential goods are most affected by the increase in prices.
- Poorest households suffered a rise in prices 2 to 5 percentage points higher than the wealthiest households.
- Target compensatory policies financed through higher revenues from energy taxes could be an effective way to mitigate the regressive effect of inflation.

INTRODUCTION¹

European Union (EU) countries are experiencing a rapid increase in prices after years of low inflation levels. As Figure 1 shows, the annual inflation rate in the EU (left axis) started to escalate in 2021, rising above 3% by October and reaching 7.8% in March 2022. The reopening of the European economies after the Covid-19 restrictions (and the reorganisation of the supply chains and bottlenecks that ensued), followed by the growth in energy prices, was mainly responsible for this increase (ECB 2021; ECB 2022a). Energy prices started rising in the summer of 2021 and grew rapidly since (right axis), further pressured upward by the war in Ukraine. Today, energy prices are the primary driver of inflation, and it is expected that this trend will persist over the upcoming months (ECB 2022b).

Economic and policy analysis tends to focus on the impact of inflation on the overall economy, overlooking that the effects of price increases can differ significantly across households. However, as some studies have shown (e.g. Bach & Ando 1957; Gürer & Weichenrieder 2020; He et al. 2021), inflation can have an uneven impact across the population. This is because the consumption basket can vary considerably across households depending on the income level. Since the rise in prices does not affect all items equally, the impact of inflation

may vary depending on the composition of the consumption basket.

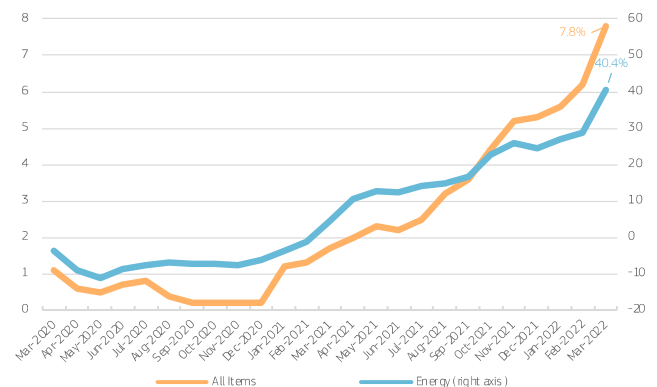


Figure 1 – Average inflation rate. European Union (27 countries). Percentage (%) annual change.

Source: OECD, 2022.

Unfortunately, few studies focus on the current inflationary wave's effect on households with different income levels (for an exception, see Claeys & Guetta-JeanRenaud 2022). This report addresses this issue, assessing to what extent the recent rise in prices has had a heterogeneous impact on the distribution of income in European households.

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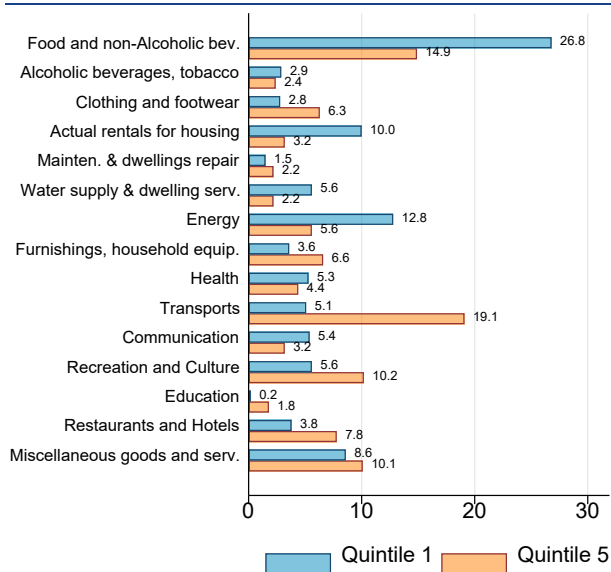
The following section presents the differences in the basket of consumption of the European households depending on their income level. Section 3 combines these data with information on the level of inflation to assess how it varies across the income distribution. Finally, Section 4 briefly discusses policy implications.

CONSUMPTION PATTERNS OF EUROPEAN HOUSEHOLDS

We employ data from the latest edition of the Household Budget Survey (2015) to obtain information on the consumption pattern of 17 Member States². First, we divide the population in each country into quintiles according to their level of consumption.³ In this way, we obtain five groups of households ranked by their proxied income level.

Figure 2 reports the distribution of expenditure in the 1st (poorest) and 5th (richest) quintiles of the distribution.⁴ A few common trends are worth highlighting despite some country differences. Poorest households concentrate a high share of their expenditure on food (on average 26.8% of the total, with peaks of 40.0% and 47.7% in Latvia and Lithuania), followed by electricity and gas (12.8%) and rents (10%). On the contrary, more affluent households devote, on average, 19% of their expenditure on transport, followed by food (15%) and recreation and culture and miscellaneous goods.

Figure 2 – Average EU expenditure in the 1st and 5th quintiles of consumption by item. Share (%) of total consumption.



For country details see table A1 in the appendix. Source: HBS, 2015.

² Given the lack of data for some countries we cannot cover the totality of EU Member States.

³ Due to the lack of data on the income level for some countries, we divided households according to the distribution of consumption. The level of consumption is a good proxy of the income level of European households. The higher the income, the higher the consumption. As robustness test, we also estimated the upcoming results using the level of households' income (where available) and the findings do not vary.

Comparing the differences in the type of expenditure shows that, on the one hand, the basket of consumption of poorer households is concentrated on essential items (food, energy and rents) that are relatively inelastic to prices. On the other hand, wealthier households spend a larger share on leisure items (e.g., part of expenditure on transport or on recreation and culture) that are more easily substitutable.

THE IMPACT OF INFLATION ACROSS INCOME GROUPS

Energy prices are the main driver of the current growth in inflation. Table A.1 in the Appendix shows that energy items recorded the most significant increase in almost all EU countries. However, there are some significant differences across countries worth noting. For example, the growth in energy prices has been exceptionally high in the Netherlands (+157%), Spain (+80%), Belgium (+74%) and Italy (+72%). In other countries such as Hungary (+1.5%) or Portugal (9.2%), the growth of energy prices has been much more contained. Transport is the second most affected item by inflation, which is hardly surprising as the transport industry relies heavily on energy use.

To assess the impact of inflation on different income groups, we matched data on the consumption baskets by quintile of consumption with the information regarding the consumer price index (CPI) in the 15 groups of items presented in Figure 2. We employ the HICP that provides information regarding the growth rate of prices from March 2021 to March 2022.

Figure 3 shows the aggregate levels of inflation by quintiles of consumption and the contribution of each item. As can be observed, the impact of inflation varies considerably across income groups. In many countries, namely Belgium, Greece, Italy, Ireland, Latvia, Lithuania, the Netherlands and Spain, inflation has been regressive, especially affecting the most vulnerable part of the population.⁵ In these countries, the poorest households have suffered inflation between 2.6 percentage points (in the case of Ireland) and 5.3 percentage points (in Italy) higher than the wealthiest households.

These results suggest a highly unequal distribution of the impact of the growth of prices that disproportionately affects vulnerable households in the 8 countries mentioned above.

Only few countries show the opposite trend, where the top quintiles experience higher inflation levels. These are Finland, Hungary and Sweden. However, the distance between the bottom and top quintiles is more contained. The widest gap is recorded in Finland, where the inflation rate for the 5th quintile is 1.4 percentage points higher than the 1st quintile. Finally, there are no appreciable differences across quintiles of the

Further methodological discussion on this issue can be found here:

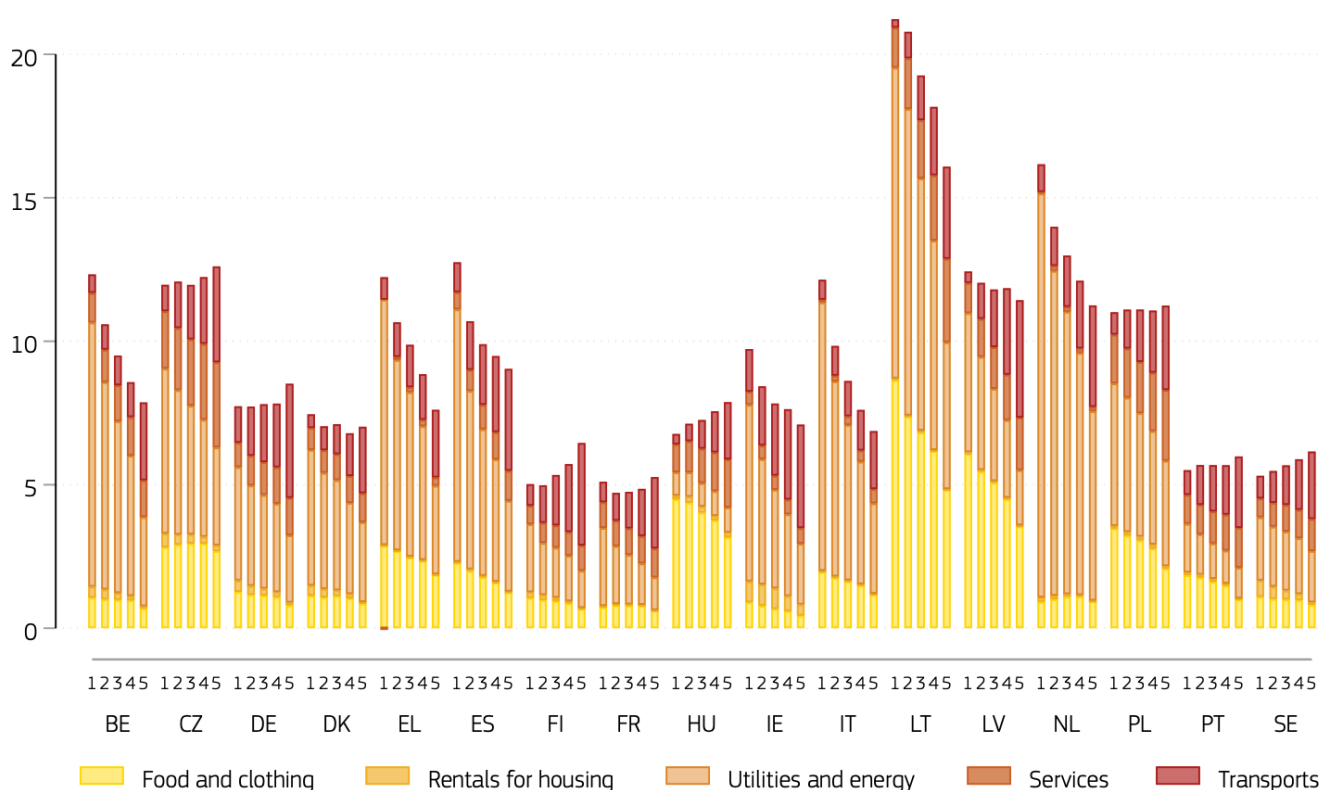
https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Interaction_of_household_income_consumption_and_wealth_-_methodological_issues

⁴ For the sake of simplicity, we omit quintiles 2, 3 and 4 from the figure.

⁵ Apart from Latvia, the difference between the bottom and top quintiles tends to be considerable.

distribution in the Czech Republic, France, Denmark, Germany, Poland and Portugal.

Figure 3 – Inflation rate by quintiles and contribution of each item based on the consumption basket. Annual percentage change (%). March 2021 – March 2022.



Source: For simplicity, the 15 initial types of items were reclassified into five groups. See table A.3 in the appendix for detail on the reclassification.

The regressive impact of inflation results from the higher expenditure on energy and, to a lesser extent, food of poorer households. As shown in Figure 3, these items are responsible for most of the growth in prices for poorer households. Considering that households at the bottom of the income distribution usually spend a considerable share of their income on other essential and non-replaceable goods such as rents (see Figure 1 and Table A.2 in the appendix), the consequences of a price increase can have grave implications for vulnerable households in the absence of compensatory policies. Although significant, the impact of energy and food prices on the inflation rate of the wealthiest households is lower. For these households, other items (especially transport) contribute more to inflation growth.

POLICY IMPLICATIONS

Soaring inflation rates in the EU are likely to persist with adverse economic implications for households. In the past

months, some Member States have sought to offset these with urgent measures such as introducing generalised reduced VAT rates or reduced excise duties on energy and electricity.

However, although these measures are relatively easy to implement, they do not necessarily follow the principles of effectiveness, consistency and equity, as recently pointed out by the European Commissioner for Economy Paolo Gentiloni⁶. Instead, the Commission has laid out a toolbox for national governments to tackle energy prices in the short and medium term that include measures such as emergency income support, targeted lower taxation or State aid for vulnerable households.⁷

Other frequently discussed measures are price regulation or restriction of energy prices. Although price regulation is not allowed under EU legislation at the electricity wholesale market level, in agreement with the Commission, Portugal and

⁶ Commissioner Gentiloni issues guidance in the area of energy taxation to EU Member States https://ec.europa.eu/taxation_customs/news/commissioner-gentiloni-issues-guidance-area-energy-taxation-eu-member-states-2022-04-25_fr

⁷ COM/2021/660 final <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2021:660:FIN>

Spain will activate a temporary mechanism to lower electricity prices by introducing price caps on fuel prices that will last for one year.

Another set of measures consist of rising the taxes on the extra-profits obtained by energy companies. In this line, Italy has introduced a temporary tax of 10% on the extra profits realised by energy companies to fund the reduction of taxes on oil derivatives and extended the plateau of households that can benefit from the energy subsidies. Analogously, Germany will fund a one-off energy tax-relief payment of €300 and reduce the taxes on gasoline.

As shown in this report, the regressive effects of inflation in some countries stress the urgency to implement policies that adhere to the principle of social fairness. For this reason, targeted support to vulnerable households, financed through higher revenues from taxation of extra-profits –especially since corporate profits seem to have contributed disproportionately to inflation⁸–, can help to comply with both climate objectives and the principle of social fairness as part of the European Pillar of Social Rights.⁹

In the long term, additional structural reforms may be required to avoid a disproportionate cost to vulnerable households if high inflation persists. Given that wages are traditionally more rigid to price changes than other income sources (e.g. profits), Member States may need to revise their wage indexation mechanisms to help contain the loss of purchasing power, especially the one of those at the bottom of the distribution of income/consumption. The revision of these indexation mechanisms could also help compensate for the negative demand shock derived from the net loss of purchasing power, affecting economic growth in the near future.

REFERENCES

- Bach GL, Ando A. 1957. The Redistributive Effects of Inflation. *Rev Econ Stat.* 39(1):1.
- Claeys G, Guetta-Jeanrenaud L. 2022. Who is suffering most from rising inflation? [Internet]. [accessed 2022 Apr 26]. <https://www.bruegel.org/2022/02/who-is-suffering-most-from-rising-inflation/>
- ECB. 2021. Why is inflation currently so high? [Internet]. [accessed 2022 Apr 25]. https://www.ecb.europa.eu/ecb/educational/explainers/tell-me-more/html/high_inflation.en.html
- ECB. 2022a. Inflation in the near-term and the medium-term. Opening remarks by Philip R. Lane, Member of the Executive Board of the ECB, at MNI Market News Webcast [Internet]. [accessed 2022 Apr 25]. <https://www.ecb.europa.eu/press/key/date/2022/html/ecb.sp22>

⁸ Corporate profits have contributed disproportionately to inflation. How should policymakers respond? <https://www.epi.org/blog/corporate-profits-have-contributed-disproportionately-to-inflation-how-should-policymakers-respond/>

0217_1~592ac6ec12.en.html

ECB. 2022b. Press conference, 4 April 2022. Christine Lagarde, President of the ECB, Luis de Guindos, Vice-President of the ECB [Internet]. [accessed 2022 Apr 25]. <https://www.ecb.europa.eu/press/pressconf/2022/html/ecb.is220414~fa5c8fe142.en.html>

Gürer E, Weichenrieder A. 2020. Pro-rich inflation in Europe: Implications for the measurement of inequality. *Ger Econ Rev.* 21(1):107–138.

He Z, Sun X, Berkovich E. 2021. Impact of Inflation by Household Income. [accessed 2022 Apr 27]:1–7. <https://budgetmodel.wharton.upenn.edu/issues/2021/12/15/consumption-under-inflation-costs>

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On the European context, see The Globalisation of Inflation https://www.ecb.europa.eu/press/key/date/2022/html/ecb.sp220511_1~e9ba02e127.en.html

⁹ https://joint-research-centre.ec.europa.eu/crosscutting-activities/fairness_en

APPENDIX

Table A.1 – Yearly inflation rate across EU countries (March 2022). Percentage change compared to March 2021. Source: OECD.

	Avg. EU	BE	CZ	DK	FI	FR	DE	EL	HU
All items	8.4	8.3	12.7	5.4	5.8	4.5	7.3	8.9	8.5
Food and non-Alcoholic beverages	7.7	4.8	7.7	6.3	5.1	3.2	5.9	8.1	13.4
Alcoholic beverages, tobacco	3.6	3.0	7.6	2.5	2.7	0.3	4.0	0.4	6.9
Clothing and footwear	3.4	1.1	18.3	1.2	0.8	3.5	2.0	6.5	4.1
Actual rentals for housing	3.4	2.6	4.4	1.7	1.1	0.4	1.6	0.8	7.4
Maintenance & dwellings repairs	9.8	4.8	16.4	10.4	10.8	4.5	10.3	2.1	20.1
Water supply and dwelling serv.	2.8	5.7	4.6	1.3	2.2	1.7	2.2	-0.1	1.4
Energy	46.1	73.6	26.5	34.0	27.5	24.4	35.3	62.8	1.5
Furnishings, household equip.	6.0	3.2	10.7	5.2	2.7	3.5	4.7	3.7	9.5
Health	2.3	1.1	7.7	1.5	-1.1	-1.3	0.9	0.0	5.5
Transport	15.8	11.2	21.6	10.2	13.7	11.5	17.5	15.4	12.4
Communication	0.6	1.2	-0.1	0.5	8.0	1.8	-0.1	-2.9	-1.9
Recreation and culture	3.8	2.6	9.9	1.9	3.3	1.8	5.0	0.1	5.3
Education	-0.9	1.0	1.9	2.2	0.7	2.0	1.5	0.9	5.6
Restaurants and hotels	6.9	5.9	14.5	5.8	4.8	3.3	5.6	2.8	11.7
Miscellaneous goods and serv.	3.6	3.7	7.4	2.7	0.0	3.1	2.0	0.1	5.7

	IE	IT	LV	LT	NL	PL	PT	ES	SE
All items	6.7	6.5	11.5	15.7	9.7	11.0	5.3	9.8	6.0
Food and non-Alcoholic beverages	3.1	5.8	14.7	17.1	6.4	9.2	7.2	6.8	5.8
Alcoholic beverages, tobacco	7.0	0.5	4.0	7.9	2.1	5.3	2.6	3.0	1.7
Clothing and footwear	-0.8	1.3	5.2	4.0	2.8	3.3	0.1	3.0	1.6
Actual rentals for housing	7.2	0.7	3.4	10.5	0.8	9.7	2.2	0.9	1.8
Maintenance & dwellings repairs	6.5	1.6	6.7	22.5	10.6	14.2	9.8	4.8	
Water supply and dwelling serv.	2.4	1.0	5.0	3.7	1.7	7.5	2.4	1.3	4.3
Energy	46.7	71.6	21.5	57.4	157.4	24.3	9.2	80.0	30.1
Furnishings, household equip.	2.7	3.2	7.4	13.2	6.7	7.8	5.6	4.2	8.1
Health	0.2	0.8	5.5	5.7	2.0	6.0	1.1	1.1	2.5
Transport	18.7	11.0	22.9	22.1	16.6	24.1	11.0	18.6	10.9
Communication	2.2	-3.5	1.7	3.7	-2.8	3.0	1.8	-0.5	-1.2
Recreation and culture	2.9	0.5	4.2	9.9	2.8	7.4	3.1	1.2	2.9
Education	-0.8	-0.5	-0.6	7.6	-45.2	6.0	1.4	1.2	
Restaurants and hotels	3.6	4.7	7.7	12.6	5.1	12.7	6.6	4.4	6.0
Miscellaneous goods and serv.	-1.0	1.2	8.5	12.4	1.9	6.2	2.0	2.8	3.0

Table A.2 – Share (%) of expenditure in the 1st and 5th quintiles of consumption. Source: HBS

Consumption quintile	Avg. EU		BE		CZ		DE		DK		EL		ES		FI		FR	
	1	5	1	5	1	5	1	5	1	5	1	5	1	5	1	5	1	5
Food and non-Alcoholic bev.	26.8	14.9	19.5	11.8	25.5	17.6	18.4	10.5	21.2	3.5	33.1	16.8	30.3	14.5	18.6	11.6	17.9	13.9
Alcoholic beverages, tobacco	2.9	2.4	2.9	1.9	2.6	2.7	2.6	1.5	0.7	2.1	3.6	3.6	2.8	1.9	3.4	1.7	3.2	2.4
Clothing and footwear	2.8	6.3	3.0	5.7	3.6	6.2	4.0	5.7	4.9	2.7	2.7	7.5	4.0	7.1	1.4	4.3	4.1	4.5
Actual rentals for housing	10.0	3.2	14.5	2.9	10.7	4.5	25.1	6.5	12.9	6.2	3.5	2.5	4.7	2.7	18.3	3.5	12	4.7
Maintenance & dwellings repairs	1.5	2.2	0.7	1.1	1.1	2	0.6	1.2	16.2	11.5	0.4	0.8	0.9	1.2	0.5	1.7	0.2	1.0
Water supply and dwelling serv.	5.6	2.2	3.5	1.4	3.5	2.1	0	0	3.1	2.1	5.3	1.5	7.4	2.5	9.3	4.1	6.9	1.9
Energy	12.8	5.6	12	3.6	18.7	8.1	10.6	5.3	2.0	5.8	13.4	4.6	10.6	3.5	7.3	3.2	10.1	3.4
Furnishings, household equip.	3.6	6.6	3.6	9.0	4.4	7.8	3	7.3	3.8	8.2	4.0	5.4	4.9	5.8	4.0	5.5	3.5	6.7
Health	5.3	4.4	4.3	5.3	3.3	2.4	2.5	6.4	2.7	2.5	10.1	7.9	3.3	5.0	6.2	3.1	1.8	1.7
Transport	5.1	19.1	5.7	24.2	4.3	15.5	7.3	22.8	4.7	22.8	5.1	15.3	5.6	19.1	5.5	26.1	6.2	21.6
Communication	5.4	3.2	6.3	2.1	4.7	3.9	4.5	2.2	4.1	2.2	6.1	3.4	5.8	2.7	4.4	2.3	5.2	1.9
Recreation and culture	5.6	10.2	5.9	11	7.4	11.1	9.0	13.2	9.7	11.2	1.5	6.2	3.4	8.0	7.2	12.0	6.7	10.5
Education	0.2	1.8	0.2	0.8	0.2	0.9	0.5	1.2	0.2	0.8	0.1	5.4	0.3	2.7	0.1	0.2	0.2	1
Restaurants and hotels	3.8	7.8	4.2	8.6	3.8	7.8	3.8	6.7	4.4	7.3	5.9	11.6	5.6	13.8	2.5	7.0	3.1	7.9
Miscellaneous goods and serv.	8.6	10.1	13.6	10.8	6.1	7.4	8.1	9.5	9.4	11	5.1	7.5	10.6	9.4	11.3	13.8	18.9	16.7

Consumption quintile	HU		IE		IT		LT		LV		ND		PL		PT		SE	
	1	5	1	5	1	5	1	5	1	5	1	5	1	5	1	5	1	5
Food and non-Alcoholic bev.	30.8	20.6	21.5	11.0	33.0	18.7	47.7	24.0	40.0	20.1	12.4	11.0	35.2	18.7	24.7	13.2	17.5	11.7
Alcoholic beverages, tobacco	4.0	2.8	3.8	2.2	2.2	2	4.9	3.7	3.3	3.4	2.6	3.3	2.8	2.3	2.0	1.5	2.2	1.8
Clothing and footwear	2.4	5.3	2.6	6.3	3.1	7.4	1.7	10.5	1.1	8.7	2.8	6.3	2.6	6.9	2.2	5.4	2.0	6.3
Actual rentals for housing	1.8	2.2	10.0	5.3	5.9	2.5	0.6	0.2	2.2	1.3	20.2	3.4	1.0	0.9	4.5	1.8	30.7	4.7
Maintenance & dwellings repairs	0.5	1.3	1.0	1.6	0.7	0.8	0.2	1.5	0.1	0.9	0.4	0.8	0.6	3.4	0.7	1.7	0.9	3.1
Water supply and dwelling serv.	7.7	4.2	2.3	0.8	7.5	2.7	3.0	1.3	7.7	2.3	6.1	2.4	10.1	3.8	4.4	1.8	2.2	1.4
Energy	21.4	9.6	12.7	4.0	12.7	4.1	17.8	6.8	19.9	6.1	8.7	3.7	16	9.7	14.4	5.7	5.9	3.6
Furnishings, household equip.	3.1	4.3	4.3	4.8	4.2	6.3	3.3	6.1	2.2	5.8	3.1	8.7	2.9	6.9	3.5	6.0	4.3	8.0
Health	6.6	4.3	2.1	3.4	6.6	6.5	9.2	6	8.4	5.0	1.1	1.8	7.0	5.1	11.0	5.6	1.8	2.4
Transport	3.0	16.2	8.0	19.3	6.4	18.4	1.3	14.5	1.8	17.9	5.8	21.4	3.2	12.2	7.8	22.6	7.3	21.5
Communication	6.9	6.5	7.7	3.6	4.8	2.7	3.9	3.7	4.8	3.4	5.3	2.8	6.1	4.1	5.8	2.9	5.1	2.8
Recreation and culture	4.1	8.7	7.7	10.6	3.0	8.1	2.4	8.2	4.9	9.9	6.3	11.0	3.8	9.7	2.6	6.1	11.3	19.2
Education	0.3	1.3	0.3	4.7	0.2	1.1	0	1.2	0.1	1.7	1.3	1.7	0.1	1.8	0.3	4.4	0	0.4
Restaurants and hotels	1.3	5.0	5.1	9.2	2.3	8.2	0.7	5.2	1.3	6.7	4.7	7.7	4.3	4.9	8.0	12.8	2.7	5.0
Miscellaneous goods and serv.	6.1	7.8	11	13.2	7.4	10.6	3.2	7.1	2.4	6.7	19	14.1	4.3	9.5	8.1	8.4	6.1	7.9

Table A.3 – Original and revisited items classification (employed in Figure 2).

Original classification	Revisited classification
Food and non-Alcoholic beverages	Food and clothing
Alcoholic beverages, tobacco	
Clothing and footwear	
Actual rentals for housing	Rentals for housing
Maintenance & dwellings repairs	Utilities and energy
Water supply and dwelling serv.	
Energy	
Furnishings, household equip.	
Health	Services
Transport	Transport
Communication	Services
Recreation and culture	
Education	
Restaurants and hotels	
Miscellaneous goods and serv.	

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