UNEQUAL EXCHANGE RATE PASS-THROUGH ACROSS INCOME GROUPS

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Exchange rate pass-through (ERPT) into prices and into income loss are shown to be enough to calculate ERPT into welfare loss using implications of a simple model. These ERPT measures are estimated at the good level using a unique micro-price data set from Turkey, and they are combined with income-group-specific expenditure shares at the good level to obtain aggregate-level ERPT measures for alternative income groups. An exchange rate shock resulting in a real depreciation of 1% is shown to decrease welfare by about 0.80% for the average-income consumer, while this estimate ranges between 0.73% and 0.83% for consumers in the lowest- and highest-income quintiles, respectively, suggesting evidence for redistributive effects of an exchange rate shock. Using micro prices has further resulted in showing that traded, nondurable, flexible-price, or income-elastic goods contribute more to ERPT into welfare loss for the average-income consumer, suggesting important policy implications for filtering out the noise in the measurement of aggregate-level prices.

Keywords: Exchange Rate Pass-Through, Welfare, Structural VAR, Micro Prices

1. INTRODUCTION

Open economies are subject to international shocks that are reflected as movements in their exchange rates. The effects of such movements on prices, the so-called *exchange rate pass-through* (ERPT), have been investigated in the literature extensively due to the corresponding policy implications.[1] Nevertheless, evidence in the literature is mostly for aggregate-level prices representing the cost of living for the average-income consumer (e.g., consumer price index), suppressing income redistributive effects of exchange rate movements among consumers.[2] Since the investigation of redistributive effects requires the knowledge of prices faced by alternative income groups, this paper proposes estimating ERPT measures at the good level to be further combined with income-group-specific expenditure shares of goods to obtain income-group-specific ERPT measures.

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Estimating ERPT measures at the good level (as in this paper) is also useful for avoiding any *aggregation* bias as suggested by Aron et al. (2014), since estimations at the aggregate level suppress several micro-level details. These include micro-level distortions, such as price stickiness as in Gopinath and Itskhoki (2010) and Antoniades and Zaniboni (2016), tradability of goods as in Burstein et al. (2003), Goldberg and Hellerstein (2008) or Crucini and Yilmazkuday (2014), degree of competition reflected in markups as in Kryvtsov and Midrigan (2012) who have shown that markups decrease with the depreciation rate of inventories (and thus the durability of the good), transportation costs in different sectors as suggested by Klenow and Malin (2010) or Imbs et al. (2005), or the quality of goods as in Bernini and Tomasi (2015) or Auer et al. (2018). These micro-level details not only are important to understand the economic intuition behind ERPT into good-level prices but also can be used to identify the goods/sectors responsible for the effects of exchange rate movements at the aggregate level. Using a good-level approach, this paper not only considers these micro-level details by construction but also achieves further decomposition analyses showing the contribution of each good category to ERPT measures for each income group.

Finding the goods/sectors that are responsible for ERPT measures has important monetary policy implications as well, because, as indicated in studies such as by Özmen and Sevinç (2016), understanding changes in micro prices can offer more relevant information about the nature of inflation in countries where good-level prices change more frequently compared to other countries. In particular, to have an accurate measure of inflation that can be used for optimal policy-making, the noise in aggregate-level prices should be filtered out using measures such as the *trend* or *core* inflation, and using disaggregate-level price data to determine the responsible goods/sectors (as in this paper) is one way to do it as suggested in studies such as by Gordon (1975), Clark (2001), Wynne (2008), or Stock and Watson (2016). These measures are also useful to increase the effectiveness of communicating monetary policy actions in an environment of frequently changing prices.

Regarding the estimation methodology, several empirical studies in the literature have considered single-equation frameworks that result in *endogeneity* bias (as discussed by Aron et al. (2014)). Also considering our discussion on micro-level details above, it is implied that an empirical investigation based on a system of equations at the good level is necessary to avoid both *aggregation* and *endogeneity* biases in the estimation of ERPT measures. This paper achieves such an unbiased estimation of ERPT using a structural vector autoregression (VAR) model at the good level, where, following studies such as by Shambaugh (2008) and Forbes et al. (2018), *ERPT ratios* are considered for the measurement of ERPT. Specifically, ERPT into prices (income) is measured as the cumulative response of prices (income) divided by the cumulative response of exchange rates, both following an exchange rate shock. Such an approach followed at the good level effectively addresses concerns related to both *aggregation* and *endogeneity* biases. Once ERPT into prices and income are estimated, using the implications of a simple model introduced in this paper, ERPT into welfare loss (measured by

reductions in individual utility) is calculated as ERPT into prices plus ERPT into income loss.

Micro-price data, good-level expenditure shares for alternative income groups, together with data on income and exchange rates, are used from Turkey over the monthly period between 2004m1 and 2018m12. The choice of Turkey is not arbitrary. In particular, to our knowledge, Turkish data are unique in terms of providing information on good-level expenditure shares for *alternative income groups*. Moreover, the sample period has experienced annual exchange rate changes ranging between −38.35% (depreciation of lira) and 19.22% (appreciation of lira), annual inflation rates ranging between 3.91% and 22.51%, and annual changes in industrial production ranging between −22.65% and 21.71%, all providing a unique opportunity for identifying the effects of exchange rate shocks on prices, income, and thus welfare.

The results for the average-income consumer suggest that an exchange rate shock resulting in a 1% real depreciation of the currency increases the aggregate price index by about 0.45%, reduces income by about 0.34%, and reduces welfare by about 0.80%. When the same investigation is achieved across alternative income groups, the welfare loss ranges between 0.73% and 0.83% for consumers in the lowest- and highest-income quintiles, respectively, suggesting redistributive effects of an exchange rate shock among consumers as in studies such as by Cravino and Levchenko (2017) or Cravino and Levchenko (2018). The good-level investigation in this paper also allows for the decomposition of this aggregate-level result into the contribution of each good category to the welfare of alternative income groups. In particular, among good categories, those that are traded, nondurable, flexible-price, or income-elastic contribute more to ERPT into welfare loss for the average-income consumer, and the contribution of durable and income-elastic goods gets higher as consumer income increases. Among sectors, "Food and Non-Alcoholic Beverages" followed by "Communications" and "Transport" contribute the most to ERPT into welfare loss for the average-income consumer, although this decomposition differs significantly across income groups. Specifically, ERPT into welfare loss is mostly through "Food and Non-Alcoholic Beverages" and "Housing, Water, Electricity, Gas and Other Fuels" for the lowest-income consumers, while it is mostly through "Transport" and "Communications" for the highest-income consumers. Due to their higher contribution to ERPT measures, it is implied that these sectors should be paid more attention while measuring the trend/core inflation and thus conducting policy.

The rest of the paper is organized as follows. The next section provides a theoretical motivation for the empirical investigation. Section 3 introduces the estimation methodology and the data used. Section 4 depicts the empirical results. Section 5 concludes. Good-level results are given in the Appendix.

2. THEORETICAL MOTIVATION

This section connects the good-specific ERPT measures to the welfare of individuals using a simple model. Since the main concern is to investigate the effects of

ERPT, we focus on the changes in individual welfare only due to exchange rate shocks.

2.1. Individuals

Individuals who belong to any income group g get utility C^g out of consuming a set of goods, each represented by i, according to the following constant elasticity of substitution function:

$$C^g = \left(\sum_i (\beta_i^g)^{\frac{1}{\sigma}} (C_i^g)^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{\sigma-1}}, \tag{1}$$

where C_i^g is the utility out of consuming good i by income group g, σ is the elasticity of substitution across goods, and β_i^g is a good and income-group-specific parameter. Assuming that the good-level prices (P_i's) are common across income groups, the optimization based on the budget constraint of $Y^g = \sum_i P_i C_i^g$ (with Y^g representing income for income group g) results in:

$$C_i^g = \beta_i^g \left(\frac{P_i}{P^g} \right)^{-\sigma} C^g, \tag{2}$$

where P_i^g is the price per unit of C_i^g satisfying

$$P^g \equiv \left(\sum_i \beta_i^g (P_i)^{1-\sigma} \right)^{\frac{1}{1-\sigma}} \tag{3}$$

Thus, we have

$$Y^g = P^g C^g \tag{4}$$

The expenditure share W_i^g of good i (for income group g) is implied as follows:

$$W_i^g = \frac{Y_i^g}{Y^g} = \beta_i^g \left(\frac{P_i}{P^g} \right)^{1-\sigma} \tag{5}$$

where $Y_i^g = P_i C_i^g$ represents the expenditure on good i by income group g. As is evident, although the good-level prices (P_i's) are common across income groups, the aggregate prices faced by income group (P^g's) are different due to having alternative expenditure shares of W_i^g's that are income-group-specific.

Based on the income-group-specific utility function given by equation (1), to have a connection with the existing literature that focuses on the average-income consumer, we can also have an aggregate measure of utility C as follows:

$$C = \prod_g \left(\frac{C^g}{\beta^g} \right)^{\beta^g}, \tag{6}$$

where C is the utility of the average-income consumer, C^g is the utility of income group g as above, and β^g represents an income-group-specific parameter. The

optimization of the social planner based on the budget constraint of $Y = \sum_g P^g C^g$ (with Y representing the overall income in the country) results in:

$$Y^g = P^g C^g = \beta^g PC, \tag{7}$$

where Y^g is the expenditure by income group g, P^g is the aggregate price faced by income group g per unit of C^g satisfying $P \equiv \prod_g (P^g)^{\beta^g}$, and thus we have

$$Y = PC, \tag{8}$$

where β^g is implied as the expenditure share of income group g within the overall expenditure in the country that satisfies

$$Y^g = \beta^g Y, \tag{9}$$

where equation (5) has also been used.

2.2. Welfare Effects of ERPT

This subsection investigates the welfare effects of an exchange rate shock, where welfare is measured by individual utility of C^g for income group g. As detailed in the Appendix, negative welfare effects of an exchange rate shock can be written as follows for income group g:

$$\underbrace{-\frac{\Delta c^g}{\Delta e}}_{\text{ERPT into Welfare Loss}} = \underbrace{-\sum_i W_i^g \left(\frac{\Delta y^g}{\Delta e} \right)}_{\text{ERPT into Income Loss}} + \underbrace{\sum_i W_i^g \left(\frac{\Delta p_i}{\Delta e} \right)}_{\text{ERPT into Micro Prices}}, \tag{10}$$

where small-case letters represent log variables, Δ represents changes over time due to a shock, e represents the log of exchange rate, and W_i^g's represent initial expenditure shares (that are good and income-group-specific) at the time of the shock. As is evident, negative welfare effects of an exchange rate shock (measured by ERPT into welfare loss) for income group g can be decomposed into ERPT into income loss and ERPT into micro prices. It is important to emphasize that this expression considers potential changes in expenditure weights following an exchange rate shock, and it is independent of the value of σ (as detailed in the Appendix).

Combining equations (6) and (10) results in a similar expression for the average-income consumer as follows:

$$\underbrace{-\frac{\Delta c}{\Delta e} = -\sum_g \beta^g \left(\frac{\Delta c^g}{\Delta e} \right)}_{\text{ERPT into welfare loss}} = \underbrace{-\sum_i w_i \left(\frac{\Delta y^g}{\Delta e} \right)}_{\text{ERPT into income loss}} + \underbrace{\sum_i w_i \left(\frac{\Delta p_i}{\Delta e} \right)}_{\text{ERPT into micro prices}}, \tag{11}$$

where $w_i = \sum_g \beta^g W_i^g$ is the initial expenditure share of good i for the average-income consumer at the time of a shock.

Overall, according to equations (10) and (11), the welfare calculations require the knowledge of initial expenditure shares at the time of a shock (W_i^g's for income group g and w_i's for the average-income consumer), the good-level ERPT into micro prices ($\Delta p_i / \Delta e$ for each good i), and the good-level ERPT into income loss (i.e., $-\Delta y^g / \Delta e$ for each income group g). We detail how we obtain these measures next.

3. ESTIMATION METHODOLOGY AND DATA

The estimation of ERPT measures in equation (10) requires the calculation of changes in good-level prices and income, both following changes in the exchange rate. To avoid both *aggregation* and *endogeneity* biases in the estimation of these ERPT measures (as discussed in the introduction section, above), this paper considers a structural vector autoregression (VAR) model estimated at the good level. Accordingly, we consider the VAR model based on monthly data for $z_t = \left(\Delta y_t^g, \Delta e_t, \Delta p_{i,t} \right)'$. Since data for Δy_t^g are not directly available, we use the implications of the model (i.e., $Y^g = \beta^g Y$ according to equation (9)) to obtain $\Delta y_t^g = \Delta y_t$ for given model parameters (of β^g's), where Δy_t is measured by percentage changes in the industrial production. For Δe_t, percentage changes in the real effective exchange rate are used, where a positive value of Δe_t corresponds to a real depreciation. Finally, $\Delta p_{i,t}$ represents the percentage change in the price level of good i.

The data cover the monthly period between 2004m1 and 2018m12 from Turkey. Good-level prices and industrial production data have been downloaded from the web page of Turkish Statistical Institute (www.turkstat.gov.tr), while data for real effective exchange rate (based on consumer price index, CPI) have been downloaded from the web page of The Central Bank of the Republic of Turkey (www.tcmb.gov.tr). Good-level prices consist of consumer prices that are used in the calculation of Turkish CPI. The expenditure shares have been downloaded for the only available year of 2018 from the web page of Turkish Statistical Institute as well, and they correspond to *initial* expenditure shares (at the time of a shock) in equations (10) and (11) due to using cumulative impulse responses for the estimation of ERPT measures, below. Since we consider micro prices that are continuously available during the sample period, our sample includes 323 goods that are listed in Appendix Table A1, where the corresponding good categorizations are also given. These 323 goods are defined at the *seven-digit* level based on the Classification of Individual Consumption by Purpose (COICOP).[3]

Although the obtained expenditures (and thus expenditure shares of w_i's) are available for each of the 323 goods for the average-income consumer (at the *seven-digit* level of COICOP), for alternative income groups, they are only available at the *three-digit* level of COICOP for 45 sectors that are aggregated versions of these 323 goods. Accordingly, to construct good-level expenditure shares of W_i^g's for each income group g, it is assumed that expenditure shares of goods within each of the 45 *three-digit* sectors, which are already available for the average-income consumer, are the same across income groups. Such an

approach results in having 323 good-level expenditure shares of W_i^g's for each income group at the *seven-digit* level as represented in Appendix Table A1 that not only capture the consumption patterns of alternative income groups but also are distinct from each other. To test the validity of using this approach, using $w_i = \sum_g \beta^g W_i^g$ introduced under equation (11), we can compare the *published* w_i's that have been downloaded from the web page of Turkish Statistical Institute with the *constructed* $\sum_g \beta^g W_i^g$'s that are weighted averages of income-group-specific good-level W_i^g's, where the weights are the expenditure shares of income groups within the overall expenditure in the country (β^g's for which data have also been downloaded from the very same source). The comparison is achieved in the upper-left panel of Appendix Figure A1, where the correlation between w_i's (represented by the horizontal axis) and $\sum_g \beta^g W_i^g$'s (represented by the vertical axis) is about 0.97, supporting our approach in constructing good-level expenditure shares for each income group. During the presentation of empirical results below, these alternative expenditure shares (of *published* versus *constructed*) for the average-income consumer will be used for robustness purposes as well.

The monthly series are converted into percentage changes by applying monthly year-on-year log changes, which makes them robust to the consideration of any seasonality by construction. Percentage changes are further demeaned, and estimations are achieved at the good level (for each of the 323 goods individually). The corresponding structural VAR model is given by:

$$A_o z_t = b + \sum_{k=1}^{12} A_k z_{t-k} + v_t, \tag{12}$$

where v_t is the vector of serially and mutually uncorrelated structural innovations. For estimation purposes, the model is expressed in reduced form as follows:

$$z_t = \alpha + \sum_{k=1}^{12} B_k z_{t-k} + u_t, \tag{13}$$

where $\alpha = A_o^{-1} b$, $B_k = A_o^{-1} A_k$ for all k, and it is postulated that the reduced form errors u_t can be decomposed according to $u_t = A_o^{-1} v_t$.

The identification is achieved by a combination of short-run restrictions and block exogeneity. The short-run zero restrictions (on impact) are given by:

$$\begin{bmatrix} u_t^{\Delta y_t^g} \\ u_t^{\Delta e_t} \\ u_t^{\Delta p_{i,t}} \end{bmatrix} = \begin{bmatrix} * & 0 & 0 \\ * & * & 0 \\ * & * & * \end{bmatrix} \begin{bmatrix} v_t^{Income} \\ v_t^{ExchangeRate} \\ v_t^{MicroPrice} \end{bmatrix}, \tag{14}$$

where $*$ represents an unrestricted response. The block exogeneity is given by:

$$\begin{bmatrix} u_t^{\Delta y_t^g} \\ u_t^{\Delta e_t} \\ u_t^{\Delta p_{i,t}} \end{bmatrix} = \begin{bmatrix} * & * & 0 \\ * & * & 0 \\ * & * & * \end{bmatrix} \begin{bmatrix} v_t^{Income} \\ v_t^{ExchangeRate} \\ v_t^{MicroPrice} \end{bmatrix}. \tag{15}$$

Therefore, it is assumed that exchange rate starts reacting to income shocks on impact, whereas income starts reacting to exchange rate shocks in the period following an impact. Micro-level prices are affected by income and exchange rate shocks at any time, whereas income and exchange rate do not react to micro-level prices at all (achieved by block exogeneity).[4] The latter is to ensure that micro-level shocks cannot affect macro-level variables at any point, which is also consistent with equations (10) and (11), where $\Delta y^g / \Delta e$ is independent of the micro price considered. The estimation is achieved by a Bayesian approach with independent normal-Wishart priors. A total of 2000 samples are drawn, where a burn-in sample of 1000 draws is discarded. The remaining 1000 draws are used to determine the quantiles of the pointwise distributions of the structural impulse responses that are necessary in the estimation of ERPT measures.

For each good i, following studies by Shambaugh (2008) and Forbes et al. (2018), ERPT into micro prices is connected to the empirical results of the structural VAR estimation according to the following expression:

$$\frac{\Delta p_i}{\Delta e} = \frac{\text{Cumulative Response of } \Delta p_i}{\text{Cumulative Response of } \Delta e}, \tag{16}$$

which can be estimated for any period after an exchange rate shock. Similarly, ERPT into income *loss* (i.e., minus ERPT into income) is connected to the empirical results of the structural VAR estimation according to the following expression:

$$-\frac{\Delta y^g}{\Delta e} = -\frac{\text{Cumulative Response of } \Delta y^g}{\text{Cumulative Response of } \Delta e}, \tag{17}$$

which is independent of the micro price considered (achieved by block exogeneity as detailed above). The summation of $\Delta p_i / \Delta e$ and $-\Delta y^g / \Delta e$ is considered as ERPT into welfare *loss* for good i according to equation (10). These three ERPT measures are calculated for each of the 1000 draws in the Bayesian estimation. While the medians of these distributions are considered as the Bayesian estimators of ERPT measures, the 16th and 84th quantiles of the distributions are used to construct the 68% credible intervals.

4. EMPIRICAL RESULTS

Individual estimations (at the good level) are achieved for 323 goods, and the weighted average of good-level estimates are calculated according to equation (11) for the average-income consumer as well as consumers in alternative income groups according to equation (10). Since we use cumulative response of variables in the calculation of ERPT measures as shown in equations (16) and (17), we can obtain their continuous estimates as shown in Figure 1, when *published* w_i's are used. As is evident, the estimates converge to their long-run value in about 24 months, meaning that exchange rate shocks are effective for about 2 years, consistent with earlier studies based on Turkish data such as by Rossi and Leigh (2002)
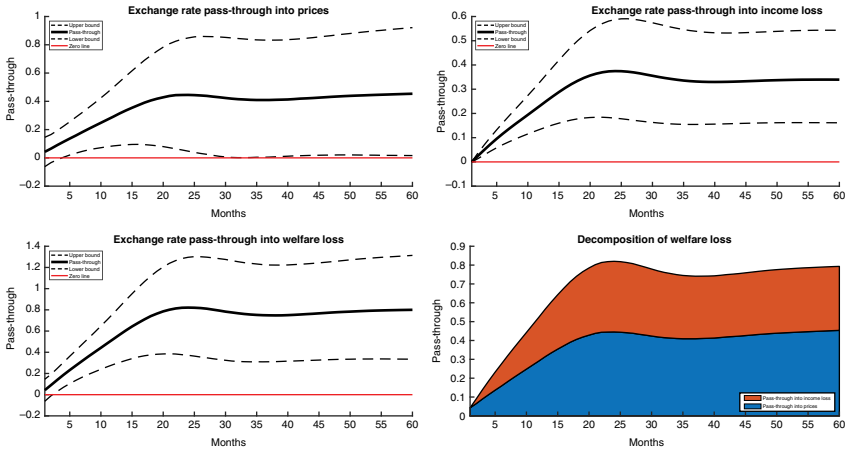
Notes: The list of labels for areas is in the same vertical order with areas in the figure. The figures represent the weighted average of the good-level estimates that are given in Appendix Table A1, where the published good-level expenditure shares for the average-income consumer have been used as weights. For each good, ERPT estimates correspond to the cumulative impulse response of the good-level prices, income or welfare divided by the cumulative impulse response of the exchange rate following an exchange rate shock in a good-specific structural VAR estimation with three variables of industrial production, exchange rate, and good-level price.

FIGURE 1. Exchange rate pass-through.

or Kara and Öğünç (2008). The corresponding long-run estimates (measured 60 months after the shock as shown in Figure 1) are given in Table 1, while good-level results that are used to construct Table 1 are given in the Appendix Table A1.

4.1. ERPT Measures

The results in Table 1 suggest that ERPT estimates into prices is about 0.45, implying that an exchange rate shock resulting in a 1% real depreciation of the currency increases the aggregate price index by about 0.45% in the long run for the average-income consumer. Such an estimate is consistent with earlier studies based on Turkish data such as by Rossi and Leigh (2002) who also have a long-run estimate of about 0.45, or by Kara and Öğünç (2008) who have a long-run estimate of about 0.3.[5]

The contribution of this paper comes into picture when the matching welfare effects are estimated by also considering ERPT into income according to equation (10). As also shown in Table 1, the corresponding ERPT into welfare loss is about 0.80%, which is about twice the ERPT into prices. Since these estimates are constructed using good-level results, investigating the contribution of each good category is essential to understand the economic intuition behind these results, which we achieve next.

TABLE 1. Exchange rate pass-through estimates in the long run

Good category	ERPT into prices			ERPT into income loss			ERPT into welfare loss			Weight (%)
	Median	Lower	Upper	Median	Lower	Upper	Median	Lower	Upper	
ALL	0.454	0.016	0.921	0.339	0.161	0.543	0.800	0.335	1.314	100.000
Traded	0.501	0.137	0.917	0.338	0.161	0.542	0.846	0.449	1.313	100.000
Nontraded	0.385	−0.158	0.927	0.341	0.162	0.545	0.735	0.171	1.315	100.000
Durable	1.063	0.543	1.724	0.341	0.164	0.546	1.416	0.895	2.087	100.000
Nondurable	0.338	−0.083	0.769	0.339	0.161	0.543	0.684	0.229	1.168	100.000
Flexible-price	0.443	0.027	0.885	0.339	0.161	0.543	0.788	0.345	1.277	100.000
Sticky price	0.636	−0.156	1.531	0.341	0.166	0.540	0.999	0.165	1.929	100.000
Income-elastic	0.623	0.085	1.192	0.342	0.164	0.547	0.972	0.409	1.589	100.000
Income-inelastic	0.287	−0.051	0.656	0.337	0.159	0.539	0.632	0.263	1.043	100.000

Notes: ERPT measures for each category have been calculated as the weighted average of the good-level ERPT measures given in Appendix Table A1, where the published good-level expenditure shares for the average-income consumer have been used as weights. For each good, long-run ERPT estimates correspond to the cumulative impulse response of the good-level prices, income loss or welfare loss after 60 months divided by the corresponding cumulative impulse response of the exchange rate following an exchange rate shock in a good-specific structural VAR estimation with three variables of industrial production, exchange rate, and good-level price. Weight (%) represents the expenditure weight of each category in the consumption basket in percentage terms.

4.2. Good Categorical Investigation

Good-level consumer prices mostly consist of traded-input costs and local distribution costs, although shares of these inputs depend on good characteristics, such as being traded or nontraded (e.g., see Crucini and Yilmazkuday (2014)).[6] Accordingly, when the same investigation is achieved for traded versus nontraded goods (i.e., when the weighted average of good-level results are taken for such categories using *published* expenditure shares as they are given in Appendix Table A1), ERPT into traded good prices is significantly positive and higher compared to insignificant ERPT into nontraded good prices, resulting in higher ERPT into welfare loss compared to nontraded goods. This is consistent with studies such as by Burstein et al. (2003), Goldberg and Hellerstein (2008), or Crucini and Yilmazkuday (2014) who have shown that prices with higher traded-input shares reflect a larger portion of foreign shocks.

Similarly, ERPT into durable good prices is significantly positive and higher than the insignificant ERPT into nondurable good prices, resulting in higher ERPT into welfare loss compared to nondurable goods. This is consistent with studies such as by Kryvtsov and Midrigan (2012) who have shown that markups decrease with the depreciation rate of inventories, and therefore sellers would accept to sell nondurable goods (with higher depreciation rates) for lower prices, implying that ERPT into nondurable prices are lower as in studies such as by Alvarez et al. (2019).

As also shown in Table 1, ERPT into price of flexible-price goods is significantly positive, while ERPT into price of sticky price goods is insignificant, consistent with studies such as by Gopinath and Itskhoki (2010) and Antoniades and Zaniboni (2016) who have shown a positive relationship between ERPT into prices and the frequency of price change. Finally, ERPT into income-elastic good prices is significantly positive and higher than the insignificant ERPT into income-inelastic good prices, in line with studies such as by Bernini and Tomasi (2015) who have shown a positive relationship between ERPT and the quality of goods that can be measured by the concept of income elasticity.

4.3. Redistributive Effects and Sectoral Investigation

Although Table 1 shows results based on each good category for the average-income consumer (based on *published* good-level expenditure shares), it does not provide any information for the aggregate-level welfare effects for consumers in alternative income groups that requires the consideration of the corresponding expenditure shares. Such an investigation is achieved in Table 2 for alternative income groups, where the contribution of each good category to ERPT into welfare loss is depicted for alternative income groups in the long run. Estimates for five income groups (with Quintile #1 and #5 representing the lowest and the highest quintiles, respectively) are presented in Table 2, where estimates for the average-income consumer have been calculated using both *published* and *constructed* good-level expenditure shares for robustness purposes (that highly mimic each other).

TABLE 2. Contribution of good categories to exchange rate pass-through into welfare in the long run

Good category	Percentage contribution of each good category						
	Published average	Constructed average	Quintile #1	Quintile #2	Quintile #3	Quintile #4	Quintile #5
Traded	60.447	60.809	61.311	60.882	60.753	59.752	61.344
Nontraded	39.553	39.191	38.689	39.118	39.247	40.248	38.656
Durable	26.477	28.914	20.358	24.349	26.896	28.709	33.398
Nondurable	73.523	71.086	79.642	75.651	73.104	71.291	66.602
Flexible-price	89.632	89.539	87.293	88.076	88.821	89.405	90.947
Sticky price	10.368	10.461	12.707	11.924	11.179	10.595	9.053
Income-elastic	57.798	58.572	42.216	51.094	53.859	58.849	66.689
Income-inelastic	42.202	41.428	57.784	48.906	46.141	41.151	33.311
ERPT into welfare loss	0.800	0.806	0.729	0.785	0.804	0.817	0.826

Notes: Quintiles represent income groups ranked from the lowest to the highest. Published average represents calculations based on the good-level expenditure shares for the average-income consumer that are downloaded from Turkish Statistical Institute, while constructed average represents calculations based on good-level expenditure shares for the average-income consumer that have been constructed using the weighted-average of quintiles. ERPT measures for each category have been calculated as the weighted average of the good-level ERPT measures given in Appendix Table A1. For each good, long-run ERPT estimates correspond to the cumulative impulse response of the good-level prices, income loss or welfare loss after 60 months divided by the corresponding cumulative impulse response of the exchange rate following an exchange rate shock in a good-specific structural VAR estimation with three variables of industrial production, exchange rate, and good-level price.
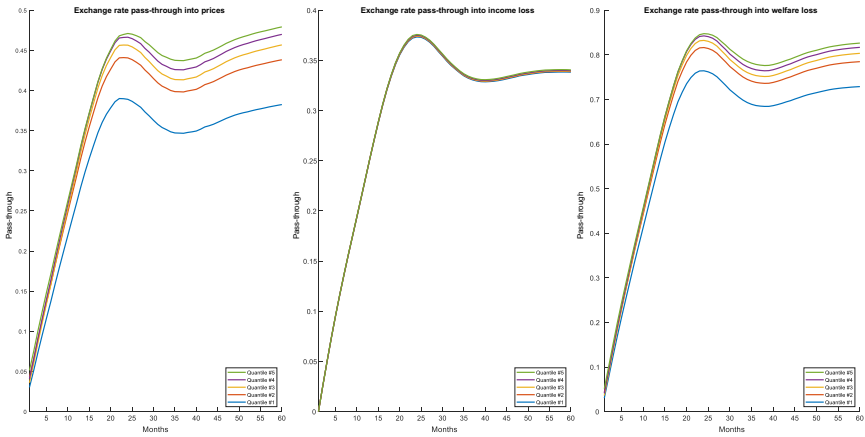
Notes: The list of labels for lines is in the same vertical order with lines in the figure. Quintiles represent income groups ranked from the lowest to the highest. ERPT measures for each category have been calculated as the weighted average of the good-level ERPT measures given in Appendix Table A1. For each good, ERPT estimates correspond to the cumulative impulse response of the good-level prices, income loss or welfare loss after 60 months divided by the corresponding cumulative impulse response of the exchange rate following an exchange rate shock in a good-specific structural VAR estimation with three variables of industrial production, exchange rate, and good-level price.

FIGURE 2. Exchange rate pass-through across income quantiles.

As is evident in Table 2, ERPT into welfare loss is higher for higher-income groups, ranging between 0.73 for the lowest-income group and 0.83 for the highest-income group in the long run. The corresponding ERPT estimates over time are given in Figure 2 for alternative income groups, where both ERPT into prices and ERPT into welfare loss estimates increase with the income level of consumers; ERPT into income estimates are virtually identical across income groups (by construction). It is implied that there is evidence for redistributive effects of an exchange rate shock across alternative income groups as in studies such as by Cravino and Levchenko (2017) or Cravino and Levchenko (2018). Since these estimates are constructed using good-level results, investigating the contribution of each good category is essential to understand the economic intuition behind these results, as we achieve next.

When the contributions of good categories to ERPT into welfare loss are considered, the contribution of durable goods is less than that of nondurable goods in Table 2, and it gets higher for higher-income consumers. In particular, while the contribution of durable goods for the lowest-income group is about 20%, it is about 34% for the highest-income group. Since many goods in our data set have flexible prices, the contribution of sticky-price goods to ERPT into welfare loss is less than that of flexible-price goods for all income groups, where the contribution of sticky-price goods is slightly lower for higher-income consumers. Finally, the contribution of income-elastic goods to ERPT into welfare loss is higher
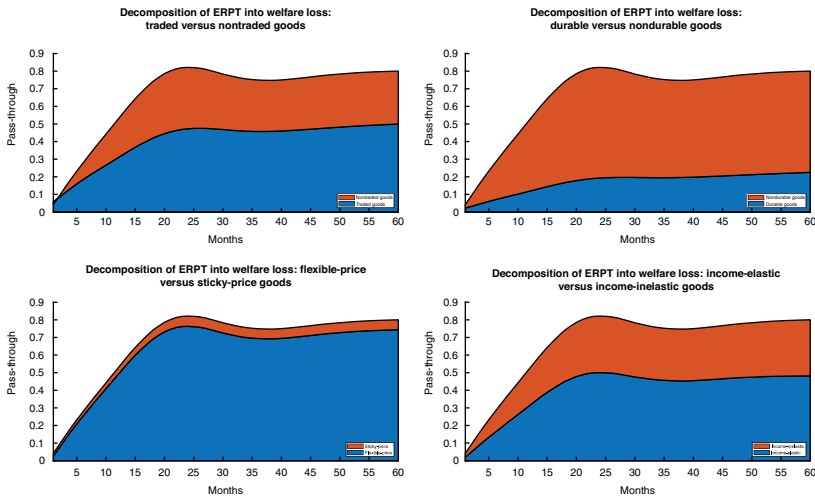
Notes: The list of labels for areas is in the same vertical order with areas in the figure. The figures represent the contribution of each good category to the ERPT into welfare based on the published good-level expenditure shares for the average-income consumer. For each good, ERPT estimates correspond to the cumulative impulse response of the good-level welfare divided by the cumulative impulse response of the exchange rate following an exchange rate shock in a good-specific structural VAR estimation with three variables of industrial production, exchange rate, and good-level price.

FIGURE 3. Exchange rate pass-through into welfare loss: Categorical decomposition.

for higher-income consumers, while the contribution of income-inelastic goods is higher for lower-income consumers. Specifically, the contribution of income-elastic goods is about 42% for the lowest-income group, while it is about 67% for the highest-income group. To summarize Table 2, one can say that traded, non-durable, flexible-price, and income-elastic goods contribute more to ERPT into welfare loss for the average-income consumer, while the contributions of durable and income-elastic goods are significantly higher for higher-income consumers. On average across all income groups, this result also holds through time as shown in Figure 3 that depicts ERPT into welfare loss estimates over time, which is constructed using ERPT into prices shown in Figure 4 and ERPT into income loss shown in Figure 5.

Sector-level ERPT estimates in the long run can be obtained similar to good categorical estimates as in Table 1 (i.e., by taking the weighted average of good-level results for each sector using *published* expenditure shares as they are given in Appendix Table A1). As is evident in Table 3, "Communications" has the highest estimates of ERPT into prices of about 2.693, while sectors such as "Health" and "Education" have very low (and insignificant) ERPT estimates as consistent with studies such as by Burstein et al. (2003), Goldberg and Hellerstein (2008), or Crucini and Yilmazkuday (2014) as discussed above. Since ERPT into income estimates are virtually identical across sectors (by construction), the estimates of ERPT into welfare loss highly reflect those of ERPT into prices in Table 3.

Notes: The list of labels for areas is in the same vertical order with areas in the figure. The figures represent the contribution of each good category to the ERPT into prices based on the published good-level expenditure shares for the average-income consumer. For each good, ERPT estimates correspond to the cumulative impulse response of the good-level welfare divided by the cumulative impulse response of the exchange rate following an exchange rate shock in a good-specific structural VAR estimation with three variables of industrial production, exchange rate, and good-level price.

FIGURE 4. Exchange rate pass-through into prices: Categorical decomposition.

When the same sector-level investigation is achieved across income groups, the results are given in Tables 4–8. As is evident, the sector-level ERPT estimates are highly similar across income groups, although the corresponding expenditure shares highly differ. In particular, while sectors of "Food and Non-Alcoholic Beverages" and "Housing, Water, Electricity, Gas and Other Fuels" together constitute about 60% of the overall expenditure for the lowest-income consumers in Table 4, they only constitute about 32% of the overall expenditure for the highest-income consumers in Table 8 who rather consume more services in sectors such as "Transport", "Recreation and Culture", "Education", and "Hotels, Cafes and Restaurants".

The combination of sector-level ERPT estimates and the corresponding expenditure shares in Tables 4–8 can be used to obtain the contribution of each sector to ERPT into welfare loss across income groups in Table 9. As is evident, "Food and Non-Alcoholic Beverages" followed by "Communications" and "Transport" contribute the most to ERPT into welfare loss for the average-income consumer. This result also holds through time as shown in Figure 6 that depicts sector-level ERPT into welfare loss estimates over time, which is constructed using ERPT into prices shown in Figure 7 and ERPT into income loss shown in Figure 8.

When income groups are compared in Table 9, ERPT into welfare loss is mostly through "Food and Non-Alcoholic Beverages" and "Housing, Water, Electricity, Gas and Other Fuels" for the lowest-income consumers, while it is
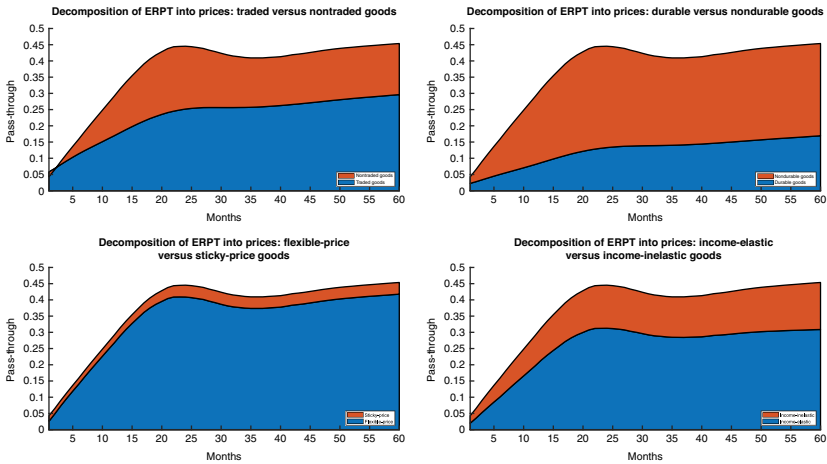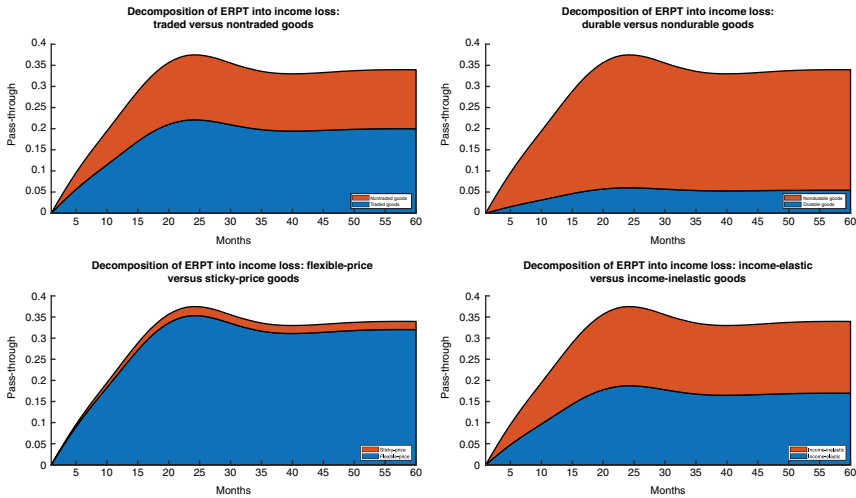
Notes: The list of labels for areas is in the same vertical order with areas in the figure. The figures represent the contribution of each good category to the ERPT into income based on the published good-level expenditure shares for the average-income consumer. For each good, ERPT estimates correspond to the cumulative impulse response of the good-level welfare divided by the cumulative impulse response of the exchange rate following an exchange rate shock in a good-specific structural VAR estimation with three variables of industrial production, exchange rate, and good-level price.

FIGURE 5. Exchange rate pass-through into income loss: Categorical decomposition.

mostly through "Transport" and "Communications" for the highest-income consumers. Therefore, the sectoral sources of ERPT into welfare loss, as well as the level of ERPT into welfare loss estimates, are highly heterogenous across income groups, providing strong evidence for redistributive effects of an exchange rate shock through alternative good categories.

Although investigating the reasons behind this result is beyond the scope of this paper, these estimates are consistent with studies such as by Bernini and Tomasi (2015) who have shown a positive relationship between ERPT and the quality of goods that can be measured by the concept of income elasticity. In particular, higher quality products (that are consumed more by higher-income consumers) require higher quality inputs that are sold by monopolistically competitive foreign firms which determine their (high) prices according to the quality of products they sell. Such an approach is consistent with having a higher contribution of "Transport" or "Communications" for the highest-income consumers, where, for example, a *durable* product of "Automobile (Gasoline)" has an ERPT into welfare loss measure of 1.127, with expenditure shares across income groups ranging between 4.074 and 17.551, or another *durable* product of "Phone machine" has an ERPT into welfare loss measure of 2.396, with expenditure shares across ranging between 0.336 and 0.847 for the lowest- and highest-income consumers, respectively.

TABLE 3. Sector-level exchange rate pass-through estimates in the long run

Sector code	Sector name	ERPT into prices			ERPT into income loss			ERPT into welfare loss			Weight (%)
		Median	Lower	Upper	Median	Lower	Upper	Median	Lower	Upper	
1	Food and non-alcoholic beverages	0.257	−0.068	0.585	0.333	0.159	0.534	0.594	0.218	0.995	24.932
2	Alcoholic beverages and tobacco	0.160	−0.069	0.392	0.335	0.161	0.541	0.503	0.253	0.776	0.419
3	Clothing and footwear	0.358	0.172	0.584	0.335	0.155	0.545	0.706	0.468	0.990	5.869
4	Housing, water, electricity, gas, and other fuels	0.285	−0.058	0.681	0.341	0.160	0.545	0.641	0.292	1.036	17.723
5	Furnishings and household equipment	0.577	0.166	1.085	0.339	0.160	0.548	0.923	0.490	1.474	8.387
6	Health	0.135	−0.624	0.852	0.348	0.163	0.550	0.479	−0.312	1.258	3.056
7	Transport	0.371	0.066	0.716	0.345	0.162	0.553	0.719	0.402	1.095	15.806
8	Communications	2.693	0.158	5.110	0.348	0.184	0.534	3.048	0.602	5.461	4.677
9	Recreation and culture	0.772	0.266	1.331	0.326	0.144	0.536	1.115	0.535	1.743	3.384
10	Education	0.026	−0.279	0.351	0.351	0.178	0.555	0.383	0.017	0.795	2.470
11	Hotels, cafes, and restaurants	0.221	0.046	0.436	0.340	0.165	0.540	0.566	0.334	0.863	7.928
12	Miscellaneous goods and services	0.672	0.286	1.150	0.343	0.162	0.549	1.024	0.600	1.554	5.350
ALL	Weighted average of all sectors	0.454	0.016	0.921	0.339	0.161	0.543	0.800	0.335	1.314	100.000

Notes: Sector-level ERPT measures have been calculated as the weighted average of the good-level ERPT measures given in Appendix Table A1, where the published good-level expenditure shares for the average-income consumer have been used as weights. For each good, long-run ERPT estimates correspond to the cumulative impulse response of the good-level prices, income loss or welfare loss after 60 months divided by the corresponding cumulative impulse response of the exchange rate following an exchange rate shock in a good-specific structural VAR estimation with three variables of industrial production, exchange rate, and good-level price. Weight (%) represents the expenditure weight of each sector in the consumption basket in percentage terms.

TABLE 4. Sector-level exchange rate pass-through estimates in the long run for income quintile #1

Sector code	Sector name	ERPT into prices			ERPT into income loss			ERPT into welfare loss			Weight (%)
		Median	Lower	Upper	Median	Lower	Upper	Median	Lower	Upper	
1	Food and non-alcoholic beverages	0.256	−0.069	0.584	0.333	0.159	0.534	0.594	0.217	0.995	34.685
2	Alcoholic beverages and tobacco	0.160	−0.069	0.392	0.335	0.161	0.541	0.503	0.253	0.776	0.330
3	Clothing and footwear	0.361	0.174	0.589	0.335	0.156	0.545	0.709	0.471	0.995	3.698
4	Housing, water, electricity, gas, and other fuels	0.179	−0.141	0.537	0.340	0.159	0.546	0.536	0.216	0.881	25.889
5	Furnishings and household equipment	0.598	0.185	1.118	0.339	0.161	0.548	0.944	0.506	1.510	7.023
6	Health	0.141	−0.574	0.824	0.348	0.166	0.549	0.484	−0.262	1.232	2.864
7	Transport	0.342	0.051	0.664	0.343	0.160	0.550	0.687	0.380	1.047	10.874
8	Communications	2.787	0.042	5.387	0.346	0.183	0.533	3.140	0.487	5.740	3.627
9	Recreation and culture	0.925	0.394	1.516	0.326	0.146	0.535	1.270	0.660	1.931	1.719
10	Education	−0.004	−0.364	0.376	0.353	0.180	0.557	0.354	−0.053	0.811	0.565
11	Hotels, cafes, and restaurants	0.225	0.072	0.418	0.342	0.167	0.541	0.572	0.355	0.853	5.380
12	Miscellaneous goods and services	0.634	0.232	1.140	0.342	0.162	0.548	0.985	0.540	1.541	3.346
ALL	Weighted average of all sectors	0.383	−0.034	0.823	0.338	0.161	0.542	0.729	0.285	1.211	100.000

Notes: Sector-level ERPT measures have been calculated as the weighted average of the good-level ERPT measures for quintile #1 given in Appendix Table A1. For each good, long-run ERPT estimates correspond to the cumulative impulse response of the good-level prices, income loss or welfare loss after 60 months divided by the corresponding cumulative impulse response of the exchange rate following an exchange rate shock in a good-specific structural VAR estimation with three variables of industrial production, exchange rate, and good-level price. Weight (%) represents the expenditure weight of each sector in the consumption basket in percentage terms.

TABLE 5. Sector-level exchange rate pass-through estimates in the long run for income quintile #2

Sector code	Sector name	ERPT into prices			ERPT into income loss			ERPT into welfare loss			Weight (%)
		Median	Lower	Upper	Median	Lower	Upper	Median	Lower	Upper	
1	Food and non-alcoholic beverages	0.257	−0.069	0.584	0.333	0.159	0.534	0.594	0.217	0.995	31.027
2	Alcoholic beverages and tobacco	0.160	−0.069	0.392	0.335	0.161	0.541	0.503	0.253	0.776	0.294
3	Clothing and footwear	0.360	0.173	0.588	0.335	0.156	0.545	0.708	0.470	0.994	4.249
4	Housing, water, electricity, gas, and other fuels	0.228	−0.101	0.601	0.341	0.160	0.546	0.585	0.252	0.951	21.202
5	Furnishings and household equipment	0.584	0.171	1.098	0.339	0.160	0.548	0.930	0.494	1.487	7.195
6	Health	0.120	−0.595	0.798	0.348	0.166	0.550	0.464	−0.285	1.205	2.833
7	Transport	0.372	0.078	0.700	0.344	0.162	0.551	0.718	0.411	1.080	12.741
8	Communications	2.713	0.133	5.170	0.347	0.184	0.533	3.068	0.577	5.522	4.631
9	Recreation and culture	0.796	0.304	1.343	0.328	0.146	0.538	1.141	0.576	1.757	2.330
10	Education	−0.005	−0.350	0.368	0.349	0.177	0.552	0.351	−0.045	0.800	0.730
11	Hotels, cafes, and restaurants	0.224	0.066	0.422	0.342	0.167	0.541	0.571	0.350	0.855	6.477
12	Miscellaneous goods and services	0.687	0.266	1.197	0.342	0.161	0.549	1.038	0.582	1.597	6.291
ALL	Weighted average of all sectors	0.438	0.002	0.902	0.339	0.161	0.542	0.785	0.321	1.292	100.000

Notes: Sector-level ERPT measures have been calculated as the weighted average of the good-level ERPT measures for quintile #2 given in Appendix Table A1. For each good, long-run ERPT estimates correspond to the cumulative impulse response of the good-level prices, income loss or welfare loss after 60 months divided by the corresponding cumulative impulse response of the exchange rate following an exchange rate shock in a good-specific structural VAR estimation with three variables of industrial production, exchange rate, and good-level price. Weight (%) represents the expenditure weight of each sector in the consumption basket in percentage terms.

TABLE 6. Sector-level exchange rate pass-through estimates in the long run for income quintile #3

Sector code	Sector name	ERPT into prices			ERPT into income loss			ERPT into welfare loss			Weight (%)
		Median	Lower	Upper	Median	Lower	Upper	Median	Lower	Upper	
1	Food and non-alcoholic beverages	0.257	−0.068	0.585	0.333	0.159	0.534	0.594	0.217	0.995	28.225
2	Alcoholic beverages and tobacco	0.160	−0.069	0.392	0.335	0.161	0.541	0.503	0.253	0.776	0.327
3	Clothing and footwear	0.359	0.173	0.586	0.335	0.155	0.545	0.707	0.469	0.992	4.675
4	Housing, water, electricity, gas, and other fuels	0.260	−0.077	0.647	0.341	0.160	0.546	0.617	0.276	0.999	19.872
5	Furnishings and household equipment	0.583	0.159	1.107	0.339	0.160	0.548	0.928	0.487	1.492	8.008
6	Health	0.144	−0.612	0.861	0.348	0.163	0.550	0.488	−0.300	1.267	2.932
7	Transport	0.401	0.106	0.733	0.345	0.163	0.552	0.748	0.443	1.109	15.277
8	Communications	2.655	0.204	5.000	0.348	0.185	0.534	3.012	0.647	5.350	5.141
9	Recreation and culture	0.815	0.308	1.379	0.327	0.145	0.537	1.159	0.578	1.792	2.691
10	Education	−0.010	−0.358	0.362	0.350	0.177	0.553	0.345	−0.054	0.796	1.130
11	Hotels, cafes, and restaurants	0.224	0.062	0.425	0.342	0.167	0.540	0.570	0.347	0.856	6.883
12	Miscellaneous goods and services	0.611	0.212	1.099	0.342	0.161	0.548	0.961	0.521	1.502	4.839
ALL	Weighted average of all sectors	0.457	0.014	0.929	0.339	0.162	0.542	0.804	0.334	1.318	100.000

Notes: Sector-level ERPT measures have been calculated as the weighted average of the good-level ERPT measures for quintile #3 given in Appendix Table A1. For each good, long-run ERPT estimates correspond to the cumulative impulse response of the good-level prices, income loss or welfare loss after 60 months divided by the corresponding cumulative impulse response of the exchange rate following an exchange rate shock in a good-specific structural VAR estimation with three variables of industrial production, exchange rate, and good-level price. Weight (%) represents the expenditure weight of each sector in the consumption basket in percentage terms.

TABLE 7. Sector-level exchange rate pass-through estimates in the long run for income quintile #4

Sector code	Sector name	ERPT into prices			ERPT into income loss			ERPT into welfare loss			Weight (%)
		Median	Lower	Upper	Median	Lower	Upper	Median	Lower	Upper	
1	Food and non-alcoholic beverages	0.257	−0.068	0.585	0.333	0.159	0.534	0.594	0.218	0.995	24.433
2	Alcoholic beverages and tobacco	0.160	−0.069	0.392	0.335	0.161	0.541	0.503	0.253	0.776	0.321
3	Clothing and footwear	0.360	0.173	0.587	0.335	0.156	0.545	0.707	0.470	0.993	4.794
4	Housing, water, electricity, gas, and other fuels	0.278	−0.063	0.672	0.341	0.160	0.545	0.634	0.288	1.025	17.563
5	Furnishings and household equipment	0.584	0.168	1.102	0.339	0.160	0.548	0.930	0.494	1.488	7.999
6	Health	0.118	−0.622	0.815	0.348	0.165	0.550	0.462	−0.311	1.222	2.882
7	Transport	0.420	0.123	0.755	0.346	0.165	0.553	0.768	0.462	1.130	18.443
8	Communications	2.690	0.162	5.101	0.348	0.184	0.534	3.045	0.606	5.452	5.093
9	Recreation and culture	0.722	0.229	1.269	0.326	0.143	0.537	1.065	0.500	1.680	3.224
10	Education	0.012	−0.325	0.373	0.352	0.180	0.556	0.371	−0.019	0.810	1.670
11	Hotels, cafes, and restaurants	0.223	0.059	0.427	0.341	0.166	0.540	0.569	0.344	0.857	8.151
12	Miscellaneous goods and services	0.635	0.225	1.132	0.342	0.161	0.548	0.985	0.536	1.534	5.427
ALL	Weighted average of all sectors	0.470	0.026	0.944	0.340	0.162	0.543	0.817	0.347	1.334	100.000

Notes: Sector-level ERPT measures have been calculated as the weighted average of the good-level ERPT measures for quintile #4 given in Appendix Table A1. For each good, long-run ERPT estimates correspond to the cumulative impulse response of the good-level prices, income loss or welfare loss after 60 months divided by the corresponding cumulative impulse response of the exchange rate following an exchange rate shock in a good-specific structural VAR estimation with three variables of industrial production, exchange rate, and good-level price. Weight (%) represents the expenditure weight of each sector in the consumption basket in percentage terms.

TABLE 8. Sector-level exchange rate pass-through estimates in the long run for income quintile #5

Sector code	Sector name	ERPT into prices			ERPT into income loss			ERPT into welfare loss			Weight (%)
		Median	Lower	Upper	Median	Lower	Upper	Median	Lower	Upper	
1	Food and non-alcoholic beverages	0.257	−0.068	0.585	0.333	0.159	0.534	0.594	0.218	0.995	19.066
2	Alcoholic beverages and tobacco	0.160	−0.069	0.392	0.335	0.161	0.541	0.503	0.253	0.776	0.433
3	Clothing and footwear	0.358	0.172	0.584	0.335	0.155	0.545	0.706	0.468	0.990	5.256
4	Housing, water, electricity, gas, and other fuels	0.313	−0.033	0.715	0.341	0.161	0.545	0.669	0.313	1.075	13.377
5	Furnishings and household equipment	0.571	0.165	1.072	0.339	0.160	0.549	0.917	0.488	1.462	8.813
6	Health	0.128	−0.629	0.843	0.348	0.163	0.550	0.472	−0.318	1.248	3.146
7	Transport	0.470	0.173	0.808	0.347	0.167	0.554	0.820	0.519	1.178	20.871
8	Communications	2.646	0.214	4.974	0.348	0.185	0.534	3.003	0.657	5.324	4.682
9	Recreation and culture	0.712	0.232	1.249	0.326	0.143	0.538	1.055	0.505	1.659	3.995
10	Education	0.000	−0.324	0.348	0.348	0.175	0.552	0.354	−0.028	0.785	4.138
11	Hotels, cafes, and restaurants	0.221	0.043	0.438	0.340	0.165	0.540	0.565	0.331	0.864	9.318
12	Miscellaneous goods and services	0.629	0.229	1.106	0.342	0.161	0.549	0.979	0.542	1.510	6.904
ALL	Weighted average of all sectors	0.479	0.048	0.944	0.341	0.163	0.544	0.826	0.369	1.336	100.000

Notes: Sector-level ERPT measures have been calculated as the weighted average of the good-level ERPT measures for quintile #5 given in Appendix Table A1. For each good, long-run ERPT estimates correspond to the cumulative impulse response of the good-level prices, income loss or welfare loss after 60 months divided by the corresponding cumulative impulse response of the exchange rate following an exchange rate shock in a good-specific structural VAR estimation with three variables of industrial production, exchange rate, and good-level price. Weight (%) represents the expenditure weight of each sector in the consumption basket in percentage terms.

TABLE 9. Contribution of sectors to exchange rate pass-through into welfare loss in the long run

Sector code	Sector name	Percentage contribution of each sector						
		Published average	Constructed average	Quintile #1	Quintile #2	Quintile #3	Quintile #4	Quintile #5
1	Food and non-alcoholic beverages	18.513	18.379	28.251	23.477	20.862	17.769	13.706
2	Alcoholic beverages and tobacco	0.263	0.225	0.228	0.189	0.205	0.197	0.264
3	Clothing and footwear	5.174	4.184	3.596	3.832	4.111	4.151	4.487
4	Housing, water, electricity, gas, and other fuels	14.192	13.580	19.047	15.800	15.256	13.641	10.826
5	Furnishings and household equipment	9.671	9.306	9.097	8.521	9.250	9.108	9.775
6	Health	1.829	1.748	1.903	1.674	1.781	1.630	1.798
7	Transport	14.199	16.735	10.241	11.653	14.228	17.333	20.706
8	Communications	17.813	17.898	15.622	18.106	19.272	18.988	17.012
9	Recreation and culture	4.714	4.280	2.996	3.388	3.883	4.201	5.100
10	Education	1.181	0.998	0.274	0.326	0.486	0.758	1.770
11	Hotels, cafes, and restaurants	5.607	5.556	4.223	4.710	4.882	5.679	6.374
12	Miscellaneous goods and services	6.844	7.111	4.519	8.324	5.786	6.544	8.181
ERPT into welfare loss	Weighted average of all sectors	0.800	0.806	0.729	0.785	0.804	0.817	0.826

Notes: Quintiles represent income groups ranked from the lowest to the highest. Sector-level ERPT measures have been calculated as the weighted average of the good-level ERPT measures for each quintile given in Appendix Table A1. Published average represents calculations based on the expenditure share of goods for the average-income consumer that are downloaded from Turkish Statistical Institute, while constructed average represents calculations based on the expenditure share of goods for the average-income consumer that have been constructed using the weighted average of quintiles. For each good, long-run ERPT estimates correspond to the cumulative impulse response of welfare loss after 60 months divided by the corresponding cumulative impulse response of the exchange rate following an exchange rate shock in a good-specific structural VAR estimation with three variables of industrial production, exchange rate, and good-level price.

FIGURE 6. Exchange rate pass-through into welfare loss: Sectoral decomposition.
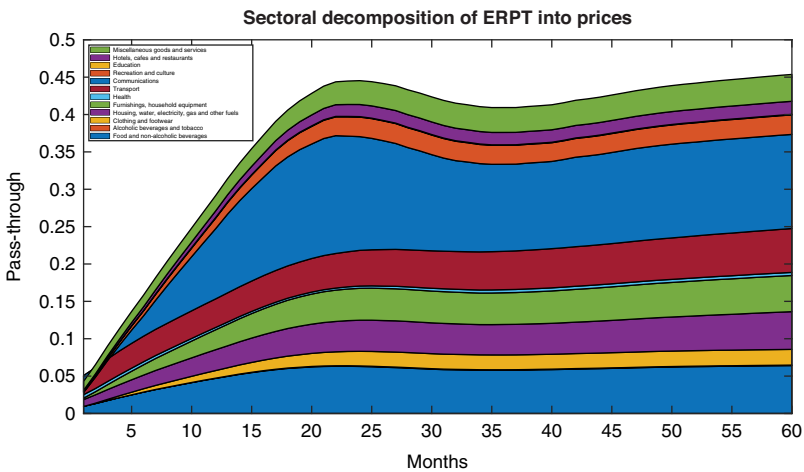
Notes: The list of labels for areas is in the same vertical order with areas in the figure. The figure represents the contribution of each sector to the ERPT into welfare based on the published good-level expenditure shares for the average-income consumer. For each good, ERPT estimates correspond to the cumulative impulse response of the good-level prices, income or welfare divided by the cumulative impulse response of the exchange rate following an exchange rate shock in a good-specific structural VAR estimation with three variables of industrial production, exchange rate, and good-level price.

FIGURE 7. Exchange rate pass-through into prices: Sectoral decomposition.

Notes: The list of labels for areas is in the same vertical order with areas in the figure. The figure represents the contribution of each sector to the ERPT into prices based on the published good-level expenditure shares for the average-income consumer. For each good, ERPT estimates correspond to the cumulative impulse response of the good-level prices, income or welfare divided by the cumulative impulse response of the exchange rate following an exchange rate shock in a good-specific structural VAR estimation with three variables of industrial production, exchange rate, and good-level price.

Sectoral decomposition of ERPT into income loss

Notes: The list of labels for areas is in the same vertical order with areas in the figure. The figure represents the contribution of each sector to the ERPT into income based on the published good-level expenditure shares for the average-income consumer. For each good, ERPT estimates correspond to the cumulative impulse response of the good-level prices, income or welfare divided by the cumulative impulse response of the exchange rate following an exchange rate shock in a good-specific structural VAR estimation with three variables of industrial production, exchange rate, and good-level price.

FIGURE 8. Exchange rate pass-through into income loss: Sectoral decomposition.

The results are also consistent with studies such as by Lopez-Villavicencio and Mignon (2017) who have shown that more commodity-intensive products experience higher ERPT measures. Specifically, foreign products have stronger market power and weaker domestic competition in commodity-intensive sectors, which results in higher ERPT measures. Such an approach is consistent not only with the product of "Automobile (Gasoline)" as detailed above but also with the products of "Petrol", "Liquid petroleum gas (LPG)", "Diesel", or "Motor oil" all of which depend on imported commodities. Numerous similar examples can be found in Appendix Table A1, where good-level results are depicted.

5. CONCLUSION

Despite the vast amount of evidence on ERPT into prices at the aggregate level, the literature lacks an analysis of ERPT into welfare loss, especially for alternative income groups and thus for redistributive effects of an exchange rate shock. This paper has been an attempt to bridge this gap using micro-price data and therefore having ERPT estimations at the good level. These good-level estimations have been used to construct aggregate-level measures of ERPT into welfare loss for alternative income groups using the corresponding expenditure shares of goods.

The results have shown that an exchange rate shock resulting in a 1% real depreciation of the currency decreases welfare by about 0.80% for the average-income consumer, while this estimate ranges between 0.73% and 0.83% for consumers in the lowest- and highest-income quintiles, respectively, suggesting evidence for redistributive effects of an exchange rate shock. Using a good-level investigation has also resulted in showing that traded, nondurable, flexible-price, or income-elastic goods contribute more to ERPT into welfare loss for the average-income consumer, and the contribution of durable and income-elastic goods significantly increase with consumer income. A similar sectoral investigation has shown that "Food and Non-Alcoholic Beverages" followed by "Communications" and "Transport" contribute the most to ERPT into welfare loss for the average-income consumer, although these responsible sectors change across income groups. In particular, while "Transport" and "Communications" contribute the most to ERPT into welfare loss for the highest-income consumers, such welfare effects are mostly through "Food and Non-Alcoholic Beverages" and "Housing, Water, Electricity, Gas and Other Fuels" for the lowest-income consumers. It is implied that there is evidence for heterogeneity across income groups regarding not only their ERPT into welfare loss estimates but also the responsible good categories for such estimates.

Regarding policy implications, the goods/sectors that have been found responsible for ERPT measures need more attention because they provide relevant information about the nature of inflation in an open-economy framework. In particular, with the knowledge of these goods/sectors, monetary authorities can understand the reasons behind domestic inflation and conduct optimal policy based on newly created *trend* or *core* inflation measures that can effectively filter out the noise in aggregate-level prices as suggested in studies such as by Gordon (1975), Clark (2001), Wynne (2008), or Stock and Watson (2016). The construction of these measures would also be useful to increase the effectiveness of communicating monetary policy actions in an environment of frequently changing prices.

NOTES

1. See Burstein and Gopinath (2014) for an excellent survey.

2. Exceptions are studies such as by Cravino and Levchenko (2017) or Cravino and Levchenko (2018) who have estimated distributional effects of large devaluations across income groups in Mexico. Theoretical studies such as by Alexander (1952), Alejandro (1963), Knight (1976), Krugman and Taylor (1978), and Barbone and Rivera-Batiz (1987) have also proposed income redistributive effects of exchange rate shocks.

3. The *two-digit* COICOP sector names (12 of them) corresponding to each good in Appendix Table A1 are given in Table 3.

4. For robustness, we also considered the alternative (standard) identification strategy of triangular factorization, where we used all six possible orderings of variables. The estimated pass-through measures were highly similar to those given in this paper, except for a small set of goods. Such results are available upon request.

5. These results are robust to the consideration of currency invoicing (e.g., see Gopinath et al. (2010)), since about 97% of Turkish imports are invoiced in foreign currencies according to Gopinath (2015).

6. As an example, even the price of "Men's hairdressing" (that is nontraded) consists of traded-input prices such as the cost of shampoo or scissors; therefore, exchange rate shocks can have an impact on nontraded good prices as well through traded-input costs.

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APPENDIX A

A.1. DERIVATION OF WELFARE CALCULATIONS

Using equation (1), the elasticity of welfare with respect to exchange rate E can be written as follows:

$$\frac{\partial C^g}{\partial E}\frac{E}{C^g} = \frac{E}{C^g}\frac{\frac{\sigma}{\sigma-1}\left(\sum_i \left(\beta_i^g\right)^{\frac{1}{\sigma}}\left(C_i^g\right)^{\frac{\sigma-1}{\sigma}}\right)^{\frac{\sigma}{\sigma-1}}}{\left(\sum_i \left(\beta_i^g\right)^{\frac{1}{\sigma}}\left(C_i^g\right)^{\frac{\sigma-1}{\sigma}}\right)}\left(\sum_i \frac{\sigma-1}{\sigma}\frac{1}{C_i^g}\left(\beta_i^g\right)^{\frac{1}{\sigma}}\left(C_i^g\right)^{\frac{\sigma-1}{\sigma}}\frac{\partial C_i^g}{\partial E}\right),$$

(A1)

which can be simplified as follows:

$$\frac{\partial C^g}{\partial E}\frac{E}{C^g} = \frac{\sum_i \left(\beta_i^g\right)^{\frac{1}{\sigma}}\left(C_i^g\right)^{\frac{\sigma-1}{\sigma}}\left(\frac{\partial C_i^g}{\partial E}\frac{E}{C_i^g}\right)}{\sum_i \left(\beta_i^g\right)^{\frac{1}{\sigma}}\left(C_i^g\right)^{\frac{\sigma-1}{\sigma}}}.$$

(A2)

Using equation (2), this expression can be rewritten as follows:

$$\frac{\partial C^g}{\partial E}\frac{E}{C^g} = \frac{\sum_i \left(\beta_i^g\right)\left(\frac{P_i}{P^g}\right)^{1-\sigma}\left(\frac{\partial C_i^g}{\partial E}\frac{E}{C_i^g}\right)}{\sum_i \left(\beta_i^g\right)\left(\frac{P_i}{P^g}\right)^{1-\sigma}}.$$

(A3)

Using equation (5), it is further implied that:

$$\frac{\partial C^g}{\partial E}\frac{E}{C^g} = \sum_i W_i^g\left(\frac{\partial C_i^g}{\partial E}\frac{E}{C_i^g}\right),$$

(A4)
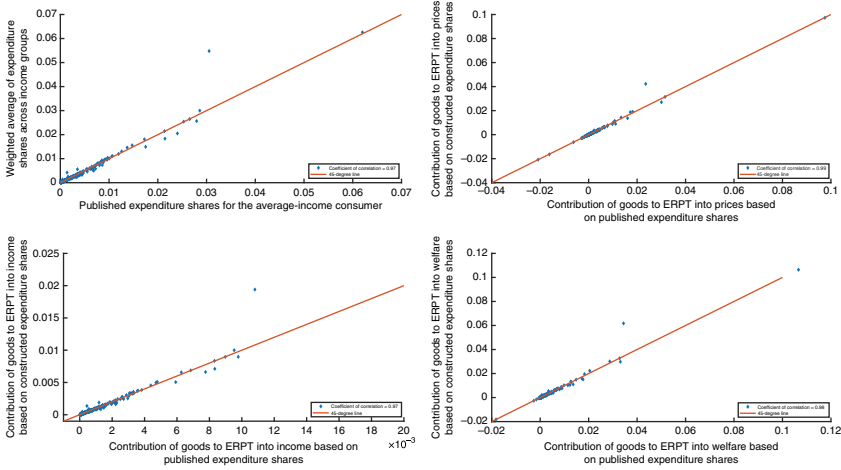
Notes: The list of labels for areas is in the same vertical order with areas in the figure. Published good-level expenditure shares, which represent those for the average-income consumer, have been downloaded from the web page of the Turkish Statistical Institute, while weighted-average of expenditure shares across income groups have been constructed by using weighted average of the income-group specific good-level expenditure shares. Contribution of goods to ERPT measures have been calculated by multiplying the good-level ERPT measures with the corresponding expenditure shares.

FIGURE A1. Published versus constructed good-level expenditure shares for the average-income consumer.

where $\sum_i W_i^g = 1$ has been used (since expenditure weights add up to one). In log changes, this expression can be rewritten as follows:

$$\frac{\Delta c^g}{\Delta e} = \sum_i W_i^g \left(\frac{\Delta c_i^g}{\Delta e} \right), \tag{A5}$$

where small-case letters represent log variables and Δ represents changes over time. Therefore, the elasticity of welfare with respect to exchange rate is equal to the weighted average of good-level consumption changes following an exchange rate shock, where weights are defined as *initial* expenditure shares at the time of this shock.

To calculate good-level consumption changes (of Δc_i^g's), consider equation (2) that can be rewritten using equations (5) and (7) as follows:

$$C_i^g = \frac{W_i^g Y^g}{P_i}, \tag{A6}$$

which can be written in log changes as follows:

$$\Delta c_i^g = \Delta w_i^g + \Delta y^g - \Delta p_i. \tag{A7}$$

Using equation (5) and dividing both sides by Δe, this can be rewritten as follows:

$$\frac{\Delta c_i^g}{\Delta e} = -\sigma \frac{\Delta p_i}{\Delta e} - (1-\sigma) \frac{\Delta p^g}{\Delta e} + \frac{\Delta y^g}{\Delta e}, \tag{A8}$$

where $\Delta \beta_i^g = 0$ has been used, since β_i^g is a (constant) taste parameter.

TABLE A1. Good-level exchange rate pass-through estimates in the long run

Good name	Sector code	Traded	Durable	Flexible-Price	Income-Elastic	ERPT into prices			ERPT into income loss			ERPT into welfare loss			Expenditure weights (%)						
						Median	Lower	Upper	Median	Lower	Upper	Median	Lower	Upper	P.A.	C.A.	Q#1	Q#2	Q#3	Q#4	Q#5
Rice	1	1	0	0	0	0.502	0.149	0.847	0.335	0.171	0.518	0.837	0.446	1.258	0.424	0.426	0.597	0.524	0.467	0.394	0.294
Wheat flour	1	1	0	0	0	0.223	0.098	0.360	0.338	0.162	0.531	0.556	0.346	0.809	0.452	0.454	0.637	0.558	0.498	0.420	0.314
Baby food	1	1	0	1	0	5.284	3.607	7.852	0.317	0.136	0.536	5.616	3.913	8.146	0.123	0.124	0.173	0.152	0.135	0.114	0.085
Boiled and pounded wheat	1	1	0	0	0	−0.078	−0.388	0.218	0.346	0.187	0.526	0.262	−0.089	0.626	0.137	0.137	0.193	0.169	0.150	0.127	0.095
Bread	1	1	0	0	0	−0.247	−0.859	0.104	0.329	0.160	0.522	0.059	−0.435	0.399	2.531	2.541	3.565	3.125	2.784	2.352	1.756
Biscuit	1	1	0	1	0	0.279	0.174	0.406	0.342	0.156	0.563	0.628	0.387	0.915	0.276	0.277	0.388	0.340	0.303	0.256	0.191
Cracker	1	1	0	1	0	0.464	0.298	0.694	0.324	0.140	0.535	0.798	0.536	1.116	0.060	0.061	0.085	0.074	0.066	0.056	0.042
Wafer	1	1	0	1	0	0.646	0.393	0.996	0.336	0.148	0.539	0.995	0.683	1.430	0.135	0.135	0.190	0.166	0.148	0.125	0.093
Cream cake and patisserie	1	1	0	1	0	0.456	0.253	0.722	0.363	0.183	0.590	0.848	0.627	1.129	0.323	0.324	0.455	0.398	0.355	0.300	0.224
Cake	1	1	0	1	0	0.751	0.546	1.041	0.346	0.173	0.553	1.108	0.819	1.500	0.095	0.095	0.133	0.117	0.104	0.088	0.066
Dessert	1	1	0	1	0	0.292	0.103	0.503	0.339	0.183	0.544	0.660	0.452	0.872	0.400	0.401	0.563	0.493	0.440	0.371	0.277
Thin dough	1	1	0	0	0	0.181	0.109	0.278	0.341	0.163	0.542	0.542	0.347	0.741	0.122	0.123	0.172	0.151	0.135	0.114	0.085
Macaroni	1	1	0	0	0	−0.641	−1.435	−0.133	0.348	0.166	0.553	−0.288	−0.974	0.159	0.156	0.157	0.220	0.193	0.172	0.145	0.108
Wermicelli	1	1	0	0	0	−0.650	−1.466	−0.163	0.349	0.168	0.530	−0.303	−1.006	0.116	0.022	0.022	0.031	0.027	0.024	0.020	0.015
Cereal	1	1	0	1	0	0.275	0.194	0.360	0.359	0.173	0.559	0.627	0.435	0.862	0.030	0.030	0.042	0.037	0.033	0.028	0.021
Veal	1	1	0	1	0	0.002	−0.182	0.198	0.320	0.145	0.502	0.320	0.019	0.650	2.138	2.146	3.012	2.640	2.352	1.987	1.483
Lamb	1	1	0	1	0	0.908	0.496	1.437	0.320	0.160	0.500	1.240	0.691	1.894	1.195	1.200	1.683	1.476	1.314	1.110	0.829
Poultry	1	1	0	1	0	0.552	0.321	0.822	0.329	0.140	0.553	0.887	0.527	1.320	1.004	1.008	1.415	1.240	1.105	0.933	0.697
Offal	1	1	0	1	0	−0.224	−0.599	0.220	0.329	0.158	0.513	0.093	−0.384	0.677	0.043	0.043	0.060	0.053	0.047	0.040	0.030
Garlic-flavored sausage	1	1	0	1	0	0.085	−0.050	0.236	0.347	0.166	0.564	0.438	0.203	0.714	0.415	0.417	0.585	0.513	0.457	0.386	0.288
Sausage	1	1	0	1	0	0.205	0.083	0.337	0.350	0.188	0.540	0.568	0.403	0.768	0.043	0.043	0.061	0.053	0.047	0.040	0.030
Salami	1	1	0	1	0	−0.140	−0.405	0.084	0.340	0.167	0.534	0.192	−0.107	0.504	0.092	0.093	0.130	0.114	0.102	0.086	0.064
Fresh fish	1	1	0	1	0	0.248	0.089	0.419	0.344	0.169	0.553	0.596	0.330	0.885	0.468	0.470	0.659	0.578	0.515	0.435	0.325
Milk	1	1	0	0	0	0.622	0.403	0.860	0.300	0.124	0.517	0.923	0.670	1.264	0.736	0.739	1.037	0.909	0.810	0.684	0.511
Yoghurt	1	1	0	0	0	0.479	0.320	0.675	0.317	0.142	0.523	0.819	0.567	1.101	0.692	0.695	0.975	0.854	0.761	0.643	0.480
White cheese	1	1	0	1	0	0.414	−0.044	1.091	0.340	0.171	0.532	0.767	0.272	1.440	0.956	0.960	1.346	1.180	1.051	0.888	0.663
Kasar cheese	1	1	0	1	0	0.370	0.216	0.576	0.312	0.122	0.518	0.695	0.468	0.979	0.395	0.396	0.556	0.487	0.434	0.367	0.274
Tulum cheese	1	1	0	1	0	0.189	0.058	0.324	0.332	0.168	0.536	0.528	0.318	0.787	0.162	0.163	0.228	0.200	0.178	0.151	0.112
Egg	1	1	0	0	0	1.239	0.938	1.589	0.326	0.162	0.553	1.574	1.229	1.995	0.817	0.821	1.151	1.009	0.899	0.760	0.567

TABLE A1. Continued

	Good categories					ERPT into prices			ERPT into income loss			ERPT into welfare loss			Expenditure weights (%)						
Good name	Sector code	Traded	Durable	Flexible-Price	Income-Elastic	Median	Lower	Upper	Median	Lower	Upper	Median	Lower	Upper	P.A.	C.A.	Q#1	Q#2	Q#3	Q#4	Q#5
Butter	1	1	0	0	0	0.348	0.202	0.497	0.341	0.162	0.556	0.698	0.471	0.934	0.406	0.408	0.572	0.502	0.447	0.377	0.282
Margarine	1	1	0	0	0	0.359	0.085	0.621	0.331	0.154	0.541	0.698	0.479	0.928	0.101	0.101	0.142	0.124	0.111	0.093	0.070
Olive oil	1	1	0	1	0	−0.830	−1.404	−0.336	0.330	0.151	0.558	−0.486	−1.131	0.019	0.325	0.326	0.458	0.401	0.357	0.302	0.225
Sun-flower oil	1	1	0	0	0	−0.168	−0.496	0.128	0.348	0.171	0.538	0.188	−0.149	0.488	0.604	0.607	0.851	0.746	0.665	0.562	0.419
Corn oil	1	1	0	0	0	−0.183	−0.514	0.089	0.343	0.160	0.541	0.141	−0.140	0.428	0.032	0.033	0.046	0.040	0.036	0.030	0.023
Apple	1	1	0	1	0	0.404	0.163	0.619	0.345	0.176	0.557	0.760	0.504	1.031	0.266	0.268	0.375	0.329	0.293	0.248	0.185
Lemon	1	1	0	0	0	−2.787	−4.309	−1.419	0.368	0.170	0.581	−2.440	−3.866	−1.103	0.108	0.109	0.152	0.134	0.119	0.101	0.075
Banana	1	1	0	1	0	0.753	0.603	0.936	0.330	0.150	0.538	1.093	0.836	1.383	0.257	0.258	0.362	0.317	0.283	0.239	0.178
Walnut (without shells)	1	1	0	1	0	0.125	−0.017	0.273	0.353	0.170	0.547	0.481	0.280	0.706	0.208	0.209	0.294	0.257	0.229	0.194	0.145
Hazelnut (without shells)	1	1	0	1	0	0.140	−0.330	0.637	0.348	0.158	0.567	0.492	−0.013	1.070	0.079	0.080	0.112	0.098	0.087	0.074	0.055
Pistachio	1	1	0	1	0	0.646	0.351	0.927	0.356	0.167	0.592	1.020	0.653	1.380	0.057	0.058	0.081	0.071	0.063	0.053	0.040
Peanuts	1	1	0	1	0	−0.054	−0.246	0.126	0.320	0.136	0.550	0.280	0.014	0.541	0.097	0.097	0.136	0.120	0.107	0.090	0.067
Roasted chick pea	1	1	0	0	0	−0.121	−0.361	0.082	0.364	0.186	0.568	0.238	−0.025	0.523	0.045	0.046	0.064	0.056	0.050	0.042	0.032
Sun flower seed	1	1	0	1	0	−0.223	−0.388	−0.064	0.330	0.134	0.537	0.103	−0.161	0.375	0.166	0.166	0.233	0.205	0.182	0.154	0.115
Pumpkin seed	1	1	0	0	0	0.067	−0.098	0.239	0.334	0.166	0.539	0.404	0.115	0.728	0.040	0.040	0.056	0.049	0.044	0.037	0.028
Raisin	1	1	0	0	0	0.396	0.263	0.540	0.335	0.192	0.522	0.738	0.531	0.988	0.043	0.044	0.061	0.054	0.048	0.040	0.030
Sweet green pepper	1	1	0	1	0	0.476	0.146	0.802	0.339	0.157	0.539	0.804	0.437	1.208	0.064	0.064	0.090	0.079	0.070	0.060	0.044
Green pepper	1	1	0	1	0	0.445	0.116	0.766	0.343	0.168	0.548	0.795	0.431	1.176	0.215	0.216	0.304	0.266	0.237	0.200	0.150
Tomato	1	1	0	1	0	0.003	−0.335	0.361	0.346	0.169	0.538	0.352	−0.023	0.767	0.966	0.970	1.361	1.193	1.063	0.898	0.670
Zucchini	1	1	0	1	0	0.173	−0.030	0.378	0.350	0.176	0.536	0.526	0.268	0.802	0.065	0.066	0.092	0.081	0.072	0.061	0.045
Onion	1	1	0	0	0	−0.107	−0.963	0.760	0.335	0.162	0.540	0.212	−0.700	1.181	0.270	0.271	0.381	0.334	0.297	0.251	0.188
Lettuce	1	1	0	1	0	−0.116	−0.284	0.056	0.347	0.159	0.565	0.236	−0.047	0.510	0.099	0.100	0.140	0.123	0.109	0.092	0.069
Parsley	1	1	0	0	0	0.100	−0.064	0.272	0.339	0.177	0.531	0.451	0.222	0.683	0.078	0.078	0.109	0.096	0.085	0.072	0.054
Eggplant	1	1	0	1	0	0.620	0.328	0.919	0.333	0.156	0.539	0.946	0.581	1.349	0.209	0.210	0.294	0.258	0.230	0.194	0.145
Cucumber	1	1	0	1	0	0.426	0.178	0.642	0.343	0.169	0.511	0.767	0.493	1.029	0.352	0.353	0.495	0.434	0.387	0.327	0.244
Garlic	1	1	0	1	0	−0.448	−1.061	0.145	0.354	0.168	0.539	−0.104	−0.705	0.482	0.045	0.045	0.064	0.056	0.050	0.042	0.031
Green onion	1	1	0	1	0	0.198	−0.109	0.511	0.346	0.162	0.561	0.553	0.209	0.930	0.042	0.042	0.060	0.052	0.047	0.039	0.029
Potato	1	1	0	0	0	0.178	−0.518	0.984	0.337	0.170	0.520	0.550	−0.257	1.338	0.566	0.568	0.797	0.699	0.622	0.526	0.393
Dry bean	1	1	0	0	0	0.333	−0.013	0.655	0.357	0.186	0.571	0.693	0.315	1.096	0.114	0.114	0.160	0.141	0.125	0.106	0.079
Chickpea	1	1	0	0	0	0.004	−0.376	0.339	0.345	0.161	0.541	0.331	−0.063	0.709	0.064	0.064	0.090	0.079	0.070	0.059	0.044

TABLE A1. Continued

Good name	Sector code	Traded	Durable	Flexible-Price	Income-Elastic	ERPT into prices			ERPT into income loss			ERPT into welfare loss			Expenditure weights (%)						
						Median	Lower	Upper	Median	Lower	Upper	Median	Lower	Upper	P.A.	C.A.	Q#1	Q#2	Q#3	Q#4	Q#5
Lentils	1	1	0	0	0	−0.106	−0.612	0.373	0.345	0.173	0.517	0.234	−0.319	0.794	0.117	0.117	0.165	0.144	0.129	0.109	0.081
Other pulse	1	1	0	1	0	0.296	0.087	0.549	0.336	0.169	0.529	0.645	0.379	0.933	0.010	0.010	0.015	0.013	0.011	0.010	0.007
Canned vegetables	1	1	0	0	0	0.138	−0.030	0.318	0.335	0.154	0.540	0.471	0.189	0.791	0.030	0.030	0.042	0.037	0.033	0.028	0.021
Tomato sauce	1	1	0	0	0	0.061	−0.181	0.286	0.351	0.146	0.558	0.402	0.172	0.648	0.182	0.183	0.257	0.225	0.201	0.169	0.126
Olive	1	1	0	1	0	0.024	−0.088	0.147	0.352	0.169	0.551	0.384	0.165	0.627	0.483	0.485	0.681	0.597	0.532	0.449	0.336
Chips and appetizers	1	1	0	1	0	0.446	0.327	0.565	0.311	0.131	0.506	0.755	0.504	1.017	0.131	0.131	0.184	0.161	0.144	0.121	0.091
Granulated sugar	1	1	0	0	0	0.164	0.043	0.299	0.343	0.160	0.539	0.506	0.296	0.767	0.406	0.408	0.573	0.502	0.447	0.378	0.282
Cube sugar	1	1	0	0	0	0.231	0.098	0.379	0.338	0.169	0.533	0.592	0.345	0.818	0.077	0.077	0.108	0.095	0.084	0.071	0.053
Jam	1	1	0	0	0	0.213	0.093	0.340	0.348	0.167	0.569	0.569	0.344	0.807	0.051	0.051	0.072	0.063	0.056	0.047	0.035
Honey	1	1	0	1	0	−0.179	−0.433	0.069	0.343	0.171	0.541	0.164	−0.119	0.481	0.213	0.213	0.299	0.262	0.234	0.198	0.147
Grape molasses	1	1	0	0	0	−0.166	−0.432	0.044	0.352	0.186	0.541	0.181	−0.128	0.467	0.060	0.060	0.084	0.074	0.066	0.056	0.042
Halvah	1	1	0	0	0	0.146	−0.053	0.310	0.339	0.174	0.536	0.487	0.213	0.752	0.070	0.071	0.099	0.087	0.078	0.065	0.049
Chocolate cream	1	1	0	1	0	0.118	0.010	0.246	0.354	0.165	0.572	0.478	0.285	0.719	0.123	0.124	0.174	0.152	0.136	0.115	0.085
Turkish delight	1	1	0	0	0	0.418	0.255	0.639	0.317	0.153	0.531	0.757	0.524	1.063	0.064	0.064	0.090	0.079	0.071	0.060	0.044
Holiday candy	1	1	0	1	0	0.621	0.324	1.005	0.345	0.168	0.545	0.984	0.599	1.456	0.156	0.157	0.220	0.193	0.172	0.145	0.108
Ice-cream	1	1	0	1	0	0.544	0.298	0.884	0.332	0.144	0.544	0.892	0.581	1.314	0.226	0.227	0.319	0.279	0.249	0.210	0.157
Condiment-spices	1	1	0	1	0	0.355	0.170	0.553	0.339	0.162	0.544	0.699	0.477	0.971	0.132	0.132	0.185	0.162	0.145	0.122	0.091
Salt	1	1	0	0	0	0.058	−0.040	0.150	0.347	0.149	0.552	0.407	0.172	0.640	0.038	0.038	0.054	0.047	0.042	0.035	0.026
Baking powder	1	1	0	0	0	1.434	−1.278	4.453	0.328	0.162	0.517	1.810	−1.071	4.905	0.020	0.020	0.028	0.025	0.022	0.019	0.014
Catchup	1	1	0	1	0	0.450	0.313	0.653	0.346	0.169	0.548	0.827	0.586	1.111	0.021	0.021	0.030	0.026	0.023	0.020	0.015
Packaged soup	1	1	0	0	0	0.735	−1.488	2.877	0.336	0.144	0.533	1.039	−1.167	3.226	0.042	0.042	0.059	0.052	0.046	0.039	0.029
Turkish Coffee	1	1	0	1	0	0.579	0.302	0.908	0.324	0.152	0.547	0.926	0.591	1.325	0.072	0.068	0.086	0.078	0.070	0.061	0.046
Ready-made coffee	1	1	0	1	0	0.974	0.432	1.609	0.341	0.175	0.520	1.307	0.781	2.008	0.080	0.076	0.096	0.086	0.077	0.068	0.051
Tea	1	1	0	1	0	0.090	−0.071	0.262	0.338	0.164	0.529	0.439	0.216	0.686	0.666	0.632	0.800	0.721	0.647	0.571	0.430
Cocoa	1	1	0	1	0	1.039	0.653	1.714	0.339	0.153	0.558	1.389	0.974	2.095	0.008	0.008	0.010	0.009	0.008	0.007	0.005
Cocoa beverages	1	1	0	0	0	0.310	0.135	0.515	0.344	0.166	0.554	0.664	0.379	0.973	0.005	0.005	0.006	0.006	0.005	0.004	0.003
Water	1	1	0	0	0	0.453	0.080	0.782	0.319	0.151	0.525	0.773	0.351	1.215	0.425	0.404	0.511	0.460	0.413	0.364	0.275
Mineral water	1	1	0	0	0	0.511	0.374	0.752	0.335	0.155	0.523	0.864	0.585	1.216	0.084	0.079	0.101	0.091	0.081	0.072	0.054
Carbonated fruity beverages	1	1	0	0	0	0.158	−0.155	0.466	0.334	0.152	0.554	0.490	0.085	0.895	0.078	0.074	0.094	0.084	0.076	0.067	0.050
Coke	1	1	0	0	0	0.036	−0.257	0.311	0.326	0.137	0.545	0.353	0.000	0.759	0.264	0.251	0.318	0.286	0.257	0.227	0.171
Fruit Juice	1	1	0	0	0	0.938	0.627	1.411	0.351	0.162	0.559	1.315	0.993	1.790	0.172	0.164	0.207	0.187	0.168	0.148	0.111

TABLE A1. Continued

Good name	Sector code	Traded	Durable	Flexible-Price	Income-Elastic	ERPT into prices Median	Lower	Upper	ERPT into income loss Median	Lower	Upper	ERPT into welfare loss Median	Lower	Upper	P.A.	C.A.	Q#1	Q#2	Q#3	Q#4	Q#5
Raki	2	1	0	0	1	0.249	0.004	0.493	0.348	0.174	0.544	0.605	0.387	0.839	0.163	0.140	0.116	0.102	0.111	0.106	0.138
Whisky	2	1	0	1	1	0.274	0.110	0.461	0.339	0.161	0.557	0.623	0.428	0.868	0.029	0.025	0.021	0.018	0.020	0.019	0.025
Wine	2	1	0	1	1	0.144	−0.126	0.437	0.340	0.156	0.531	0.481	0.181	0.817	0.035	0.031	0.025	0.022	0.024	0.023	0.030
Beer	2	1	0	0	1	0.070	−0.147	0.288	0.323	0.149	0.538	0.402	0.126	0.701	0.191	0.165	0.137	0.119	0.130	0.125	0.162
Cotton fabric	3	1	0	0	1	0.720	0.490	0.978	0.328	0.156	0.546	1.077	0.819	1.351	0.041	0.033	0.035	0.040	0.043	0.043	0.046
Mixture fabrics	3	1	0	0	1	1.908	1.372	2.748	0.343	0.155	0.576	2.286	1.717	3.170	0.023	0.019	0.020	0.023	0.025	0.025	0.027
Men's suit	3	1	0	1	1	0.603	0.399	0.866	0.335	0.150	0.553	0.949	0.721	1.246	0.228	0.183	0.195	0.222	0.244	0.242	0.260
Men's jacket	3	1	0	1	1	0.287	0.152	0.421	0.327	0.141	0.533	0.617	0.393	0.881	0.075	0.060	0.064	0.073	0.080	0.079	0.085
Men's trousers	3	1	0	1	1	0.329	0.197	0.492	0.333	0.161	0.544	0.682	0.470	0.914	0.669	0.536	0.571	0.652	0.714	0.711	0.761
Men's shirt	3	1	0	1	1	0.280	0.123	0.427	0.335	0.150	0.545	0.616	0.435	0.822	0.362	0.291	0.310	0.353	0.387	0.385	0.413
Men's pijamas	3	1	0	1	1	0.180	0.035	0.300	0.337	0.164	0.532	0.519	0.293	0.741	0.029	0.023	0.025	0.028	0.031	0.031	0.033
Men's underwear	3	1	0	1	1	0.269	0.050	0.470	0.326	0.167	0.545	0.607	0.357	0.859	0.093	0.075	0.080	0.091	0.099	0.099	0.106
Men's socks	3	1	0	0	1	0.329	0.120	0.617	0.327	0.145	0.549	0.679	0.387	1.034	0.072	0.058	0.062	0.071	0.077	0.077	0.082
Skirt	3	1	0	1	1	0.278	0.066	0.509	0.320	0.143	0.535	0.613	0.351	0.925	0.244	0.195	0.208	0.237	0.260	0.259	0.277
Women's trousers	3	1	0	1	1	0.371	0.256	0.525	0.306	0.125	0.502	0.688	0.504	0.913	0.421	0.338	0.360	0.411	0.450	0.448	0.480
Women's shirt	3	1	0	1	1	0.192	0.036	0.356	0.328	0.142	0.519	0.527	0.326	0.723	0.216	0.173	0.184	0.210	0.230	0.229	0.245
Women's t-shirt	3	1	0	1	1	0.303	0.067	0.549	0.326	0.136	0.550	0.636	0.356	0.929	0.390	0.313	0.333	0.380	0.416	0.415	0.444
Women's pijamas	3	1	0	1	1	0.339	0.232	0.465	0.356	0.175	0.546	0.703	0.499	0.922	0.066	0.053	0.056	0.064	0.071	0.070	0.075
Women's underwear	3	1	0	1	1	0.422	0.233	0.685	0.324	0.136	0.547	0.754	0.481	1.113	0.184	0.148	0.158	0.180	0.197	0.196	0.210
Women's socks	3	1	0	0	1	0.834	0.599	1.164	0.336	0.164	0.531	1.184	0.902	1.581	0.088	0.071	0.075	0.086	0.094	0.093	0.100
Children's trousers	3	1	0	1	1	0.151	−0.047	0.338	0.336	0.151	0.554	0.501	0.265	0.725	0.304	0.244	0.260	0.296	0.325	0.323	0.346
Children's shirt	3	1	0	1	1	0.206	0.001	0.399	0.351	0.170	0.572	0.555	0.295	0.845	0.067	0.054	0.058	0.066	0.072	0.072	0.077
Children's pijamas	3	1	0	1	1	0.222	0.028	0.392	0.335	0.163	0.547	0.566	0.362	0.767	0.035	0.028	0.030	0.034	0.038	0.038	0.040
Children's underwear	3	1	0	0	1	0.420	0.244	0.638	0.346	0.160	0.550	0.781	0.569	1.006	0.036	0.029	0.030	0.035	0.038	0.038	0.040
Children's socks	3	1	0	1	1	−0.016	−0.144	0.111	0.365	0.172	0.578	0.351	0.136	0.579	0.064	0.051	0.055	0.063	0.068	0.068	0.073
Overalls for baby	3	1	0	1	1	0.366	0.207	0.592	0.341	0.174	0.535	0.739	0.521	0.980	0.063	0.051	0.054	0.062	0.068	0.067	0.072
Baby's pyjamas	3	1	0	1	1	0.365	0.221	0.557	0.338	0.169	0.549	0.720	0.526	0.993	0.040	0.032	0.034	0.039	0.042	0.042	0.045
Baby's underwear	3	1	0	0	1	0.562	0.387	0.836	0.341	0.153	0.552	0.928	0.675	1.276	0.066	0.053	0.057	0.065	0.071	0.071	0.076
Knitting wool	3	1	0	1	1	1.195	0.720	1.860	0.357	0.176	0.561	1.527	1.118	2.220	0.057	0.046	0.049	0.056	0.061	0.061	0.065
Tie	3	1	0	1	1	0.341	0.196	0.521	0.349	0.160	0.549	0.704	0.482	0.947	0.019	0.015	0.016	0.018	0.020	0.020	0.021
Belt	3	1	0	1	1	0.250	0.116	0.420	0.303	0.122	0.505	0.558	0.346	0.842	0.045	0.036	0.039	0.044	0.048	0.048	0.052

TABLE A1. Continued

Good name	Sector code	Traded	Durable	Flexible-Price	Income-Elastic	ERPT into prices			ERPT into income loss			ERPT into welfare loss			Expenditure weights (%)						
						Median	Lower	Upper	Median	Lower	Upper	Median	Lower	Upper	P.A.	C.A.	Q#1	Q#2	Q#3	Q#4	Q#5
Scarf	3	1	0	1	1	−0.074	−0.239	0.081	0.372	0.162	0.590	0.286	0.047	0.560	0.149	0.119	0.127	0.145	0.159	0.158	0.170
Suit Repair	3	0	0	1	1	0.101	−0.122	0.369	0.353	0.187	0.553	0.472	0.222	0.774	0.086	0.069	0.073	0.083	0.091	0.091	0.097
Dry cleaning	3	0	0	0	1	0.366	0.181	0.599	0.343	0.155	0.552	0.717	0.499	0.994	0.067	0.054	0.057	0.065	0.071	0.071	0.076
Men's footwear	3	1	0	1	1	0.459	0.202	0.846	0.356	0.185	0.578	0.834	0.564	1.249	0.429	0.361	0.332	0.364	0.378	0.387	0.385
Men's sport shoes	3	1	0	1	1	0.945	0.640	1.377	0.332	0.165	0.547	1.318	0.962	1.774	0.295	0.249	0.228	0.251	0.260	0.266	0.265
Women's footwear	3	1	0	1	1	0.001	−0.119	0.114	0.340	0.173	0.531	0.347	0.183	0.517	0.395	0.333	0.306	0.336	0.348	0.357	0.355
Women's sport shoes	3	1	0	1	1	0.775	0.551	1.092	0.351	0.164	0.551	1.143	0.855	1.547	0.145	0.122	0.112	0.123	0.127	0.131	0.130
Children's footwear	3	1	0	1	1	−0.027	−0.159	0.114	0.346	0.152	0.562	0.323	0.125	0.558	0.102	0.086	0.079	0.086	0.090	0.092	0.091
Children's sport shoes	3	1	0	1	1	0.381	0.241	0.556	0.329	0.144	0.527	0.717	0.511	0.950	0.195	0.164	0.151	0.165	0.171	0.176	0.175
Men's footwear repair	3	0	0	1	1	1.379	0.701	2.049	0.372	0.186	0.583	1.741	1.038	2.545	0.005	0.004	0.004	0.004	0.004	0.004	0.004
Women's footwear repair	3	0	0	1	1	1.389	0.655	2.221	0.387	0.200	0.610	1.780	1.069	2.668	0.004	0.003	0.003	0.003	0.004	0.004	0.004
Actual rent	4	0	0	1	0	−0.262	−0.513	−0.021	0.335	0.150	0.550	0.098	−0.121	0.271	6.198	6.260	9.967	7.087	6.217	5.249	3.389
Expenditure on wall covering (die)	4	1	1	1	0	2.264	1.374	3.966	0.354	0.181	0.549	2.642	1.799	4.307	0.432	0.389	0.380	0.359	0.380	0.353	0.276
Expenditure on floor covering (wall tiling)	4	1	1	1	0	0.256	0.066	0.509	0.308	0.124	0.495	0.573	0.296	0.914	0.443	0.398	0.390	0.368	0.389	0.362	0.283
Windowpane (PVC)	4	1	1	1	0	3.738	2.494	5.602	0.337	0.149	0.544	4.119	2.883	5.931	0.804	0.723	0.707	0.668	0.706	0.657	0.514
Plumbing items	4	1	1	1	0	−0.095	−0.687	0.455	0.333	0.155	0.539	0.227	−0.350	0.850	0.443	0.398	0.390	0.368	0.389	0.362	0.283
Water fee	4	0	0	0	0	0.274	−0.007	0.538	0.350	0.167	0.548	0.617	0.276	0.987	2.796	2.564	2.395	2.396	2.303	2.167	2.024
Electricity fee	4	0	0	0	0	0.635	0.335	1.029	0.333	0.167	0.521	1.004	0.629	1.423	2.861	3.000	4.018	3.315	3.019	2.540	1.810
Natural gas	4	0	0	0	0	−0.146	−0.551	0.237	0.363	0.178	0.566	0.216	−0.154	0.574	1.725	1.809	2.422	1.999	1.820	1.531	1.091
Tube gas	4	0	0	1	0	−0.206	−0.474	0.010	0.344	0.147	0.577	0.120	−0.108	0.381	0.838	0.879	1.177	0.971	0.884	0.744	0.530
Coal price	4	1	0	1	0	0.460	0.242	0.695	0.349	0.179	0.540	0.815	0.612	1.039	0.900	0.944	1.264	1.043	0.950	0.799	0.569
Firewood price	4	1	0	1	0	0.137	0.042	0.230	0.342	0.157	0.553	0.488	0.316	0.662	0.488	0.398	0.398	0.328	0.299	0.251	0.179
Table	5	1	1	1	1	0.056	−0.918	0.875	0.352	0.155	0.567	0.418	−0.549	1.254	0.231	0.223	0.153	0.174	0.217	0.208	0.222
Chair	5	1	1	0	1	0.276	−0.664	0.971	0.339	0.165	0.563	0.625	−0.240	1.256	0.251	0.242	0.167	0.189	0.236	0.227	0.241
Bedroom furniture	5	1	1	0	1	0.281	0.059	0.511	0.328	0.146	0.532	0.599	0.396	0.860	0.533	0.514	0.355	0.402	0.503	0.482	0.513
Single bed	5	1	1	0	1	0.280	−0.136	0.649	0.352	0.175	0.534	0.629	0.166	1.029	0.055	0.053	0.037	0.041	0.052	0.050	0.053
Double bed	5	1	1	0	1	0.225	0.018	0.431	0.327	0.162	0.539	0.563	0.373	0.775	0.116	0.112	0.077	0.087	0.109	0.105	0.111

TABLE A1. Continued

Good name	Good categories					ERPT into prices			ERPT into income loss			ERPT into welfare loss			Expenditure weights (%)						
	Sector code	Traded	Durable	Flexible-Price	Income-Elastic	Median	Lower	Upper	Median	Lower	Upper	Median	Lower	Upper	P.A.	C.A.	Q#1	Q#2	Q#3	Q#4	Q#5
Living room furniture	5	1	1	0	1	0.424	0.181	0.688	0.344	0.176	0.570	0.786	0.569	1.044	0.882	0.850	0.586	0.664	0.830	0.796	0.847
Dining room furniture	5	1	1	0	1	−0.207	−0.586	0.102	0.321	0.165	0.526	0.130	−0.198	0.390	0.184	0.177	0.122	0.138	0.173	0.166	0.177
Sofa	5	1	1	0	1	0.264	−0.252	0.738	0.346	0.171	0.536	0.611	0.083	1.078	0.188	0.182	0.125	0.142	0.177	0.170	0.181
Nesting table	5	1	1	0	1	0.189	−0.514	0.810	0.341	0.178	0.536	0.560	−0.137	1.192	0.032	0.030	0.021	0.024	0.030	0.029	0.030
Carpet	5	1	1	1	1	2.079	1.351	3.478	0.307	0.124	0.511	2.381	1.631	3.908	0.278	0.268	0.185	0.209	0.261	0.251	0.267
Curtain	5	1	1	1	1	1.211	0.863	1.912	0.345	0.171	0.563	1.584	1.184	2.355	0.070	0.059	0.065	0.076	0.056	0.074	0.082
Tulle	5	1	1	1	1	−0.054	−0.585	0.431	0.364	0.177	0.576	0.302	−0.220	0.819	0.086	0.072	0.080	0.093	0.068	0.091	0.101
Bed cover	5	1	1	1	1	0.554	0.369	0.781	0.330	0.148	0.551	0.909	0.685	1.180	0.050	0.042	0.046	0.054	0.039	0.053	0.058
Quilt	5	1	1	1	1	0.866	0.667	1.124	0.313	0.147	0.508	1.214	0.914	1.527	0.025	0.021	0.023	0.027	0.020	0.026	0.029
Blanket	5	1	1	1	1	0.527	0.341	0.762	0.336	0.157	0.540	0.873	0.600	1.195	0.046	0.038	0.042	0.049	0.036	0.048	0.054
Bed clothes	5	1	1	1	1	0.404	0.177	0.600	0.333	0.172	0.548	0.741	0.471	1.029	0.184	0.154	0.171	0.200	0.146	0.194	0.216
Towel	5	1	1	1	1	1.321	0.885	1.882	0.375	0.201	0.592	1.719	1.223	2.346	0.077	0.065	0.072	0.084	0.061	0.081	0.090
Refrigerator	5	1	1	0	0	0.797	0.411	1.289	0.337	0.176	0.545	1.147	0.795	1.668	0.173	0.172	0.173	0.166	0.190	0.165	0.153
Refrigerator No-Frost	5	1	1	0	0	0.124	−0.053	0.311	0.318	0.138	0.502	0.447	0.218	0.677	0.325	0.322	0.325	0.312	0.358	0.310	0.287
Washing machine	5	1	1	0	0	0.586	0.297	0.940	0.344	0.145	0.547	0.925	0.662	1.257	0.387	0.385	0.388	0.373	0.427	0.370	0.343
Dish washing machine	5	1	1	0	0	0.401	0.151	0.660	0.342	0.181	0.538	0.754	0.517	1.013	0.194	0.193	0.195	0.187	0.214	0.186	0.172
Oven	5	1	1	0	0	0.910	0.609	1.266	0.341	0.154	0.555	1.272	0.883	1.700	0.095	0.094	0.095	0.091	0.105	0.091	0.084
Furnace with gas	5	1	1	1	0	0.327	0.207	0.469	0.351	0.174	0.570	0.693	0.509	0.895	0.061	0.061	0.061	0.059	0.067	0.058	0.054
Furnace with oven	5	1	1	0	0	0.798	0.252	1.404	0.332	0.147	0.532	1.151	0.570	1.800	0.048	0.048	0.048	0.046	0.053	0.046	0.042
Stove	5	1	1	1	0	0.332	0.145	0.549	0.349	0.180	0.541	0.695	0.450	0.969	0.057	0.056	0.057	0.055	0.063	0.054	0.050
Flash heaters	5	1	1	0	0	0.643	0.501	0.803	0.317	0.147	0.521	0.960	0.679	1.283	0.025	0.025	0.025	0.024	0.028	0.024	0.022
Combi boiler	5	1	1	1	0	4.098	1.690	8.269	0.341	0.168	0.555	4.461	2.076	8.614	0.192	0.191	0.192	0.185	0.211	0.183	0.170
Aspirator	5	1	1	0	0	1.448	1.054	2.109	0.333	0.150	0.533	1.814	1.343	2.462	0.015	0.015	0.015	0.015	0.017	0.014	0.013
Vacuum cleaner	5	1	1	0	0	0.616	−0.165	1.476	0.361	0.189	0.561	0.983	0.288	1.772	0.173	0.172	0.173	0.166	0.191	0.165	0.153
Blender	5	1	1	0	0	−0.365	−1.179	0.429	0.357	0.173	0.537	−0.009	−0.719	0.637	0.065	0.065	0.065	0.063	0.072	0.062	0.058
Toster	5	1	1	0	0	0.766	0.484	1.110	0.355	0.183	0.551	1.125	0.804	1.523	0.042	0.042	0.042	0.041	0.047	0.040	0.037
Water heaters	5	1	1	0	0	−0.191	−1.002	0.391	0.341	0.159	0.536	0.146	−0.634	0.721	0.057	0.057	0.058	0.055	0.063	0.055	0.051
Iron	5	1	1	0	0	0.024	−0.149	0.210	0.341	0.166	0.541	0.371	0.124	0.636	0.068	0.068	0.068	0.065	0.075	0.065	0.060

TABLE A1. Continued

	Good categories					ERPT into prices			ERPT into income loss			ERPT into welfare loss			Expenditure weights (%)						
Good name	Sector code	Traded	Durable	Flexible-Price	Income-Elastic	Median	Lower	Upper	Median	Lower	Upper	Median	Lower	Upper	P.A.	C.A.	Q#1	Q#2	Q#3	Q#4	Q#5
Repair of household appliances	5	0	1	0	0	0.024	−0.423	0.480	0.340	0.145	0.542	0.373	−0.104	0.858	0.161	0.160	0.161	0.155	0.177	0.154	0.142
Glass household utentsils	5	1	1	0	1	0.274	0.019	0.542	0.338	0.156	0.555	0.607	0.270	0.992	0.155	0.149	0.096	0.114	0.116	0.135	0.138
Porcelain household utensils	5	1	1	1	1	1.136	0.628	1.909	0.314	0.113	0.530	1.441	0.931	2.275	0.159	0.153	0.098	0.116	0.119	0.139	0.141
Steel kitchen utentils	5	1	1	0	1	1.074	0.668	1.726	0.374	0.185	0.585	1.471	1.058	2.130	0.055	0.053	0.034	0.040	0.041	0.048	0.049
Other steel kitchen utentils	5	1	1	1	1	0.819	0.527	1.314	0.343	0.161	0.562	1.196	0.822	1.722	0.144	0.138	0.089	0.105	0.108	0.125	0.128
Teflon household utentils	5	1	1	1	1	1.691	1.105	2.910	0.357	0.169	0.569	2.062	1.468	3.253	0.065	0.062	0.040	0.047	0.048	0.056	0.057
Plastic household utentils	5	1	1	0	1	−0.248	−0.590	0.109	0.349	0.155	0.562	0.109	−0.256	0.519	0.090	0.086	0.056	0.066	0.067	0.079	0.080
Other non-electrical appliances	5	1	1	1	1	1.671	1.154	2.622	0.347	0.157	0.558	2.029	1.480	2.956	0.055	0.053	0.034	0.040	0.041	0.048	0.049
Battery	5	1	1	0	0	2.280	1.458	3.893	0.317	0.133	0.536	2.629	1.770	4.303	0.038	0.041	0.057	0.029	0.030	0.037	0.033
Electric bulb	5	1	1	0	0	0.899	0.555	1.444	0.340	0.155	0.556	1.283	0.880	1.831	0.090	0.098	0.136	0.069	0.071	0.087	0.079
Door fittings	5	1	1	1	0	0.724	0.371	1.190	0.357	0.199	0.554	1.088	0.630	1.662	0.064	0.069	0.097	0.049	0.051	0.062	0.056
Stove equipments	5	1	1	0	0	0.672	0.288	1.198	0.343	0.162	0.560	1.042	0.670	1.556	0.046	0.050	0.070	0.036	0.037	0.045	0.041
Detergents (for laundry)	5	1	0	0	1	0.551	0.408	0.699	0.354	0.175	0.572	0.901	0.626	1.236	0.705	0.678	0.579	0.553	0.528	0.524	0.640
Dishwasher detergents	5	1	0	0	1	1.567	0.809	2.547	0.325	0.138	0.556	1.894	1.142	2.904	0.233	0.224	0.191	0.183	0.174	0.173	0.211
Disinfectants and insecticidies	5	1	0	0	1	0.221	0.023	0.401	0.359	0.173	0.586	0.588	0.365	0.817	0.090	0.087	0.074	0.071	0.068	0.067	0.082
Articles for cleaning	5	1	0	1	1	1.173	0.575	1.887	0.337	0.166	0.551	1.505	0.932	2.285	0.055	0.053	0.045	0.043	0.041	0.041	0.050
Sponge for dish washing	5	1	0	0	1	1.275	0.686	2.856	0.319	0.120	0.523	1.601	1.012	3.275	0.021	0.020	0.017	0.017	0.016	0.016	0.019
Aluminium and strech foil	5	1	0	0	1	−0.540	−1.611	0.286	0.342	0.175	0.518	−0.214	−1.272	0.676	0.059	0.057	0.049	0.046	0.044	0.044	0.054
Kitchen paper and napkins	5	1	0	0	1	0.602	0.344	0.875	0.342	0.168	0.542	0.962	0.629	1.312	0.155	0.149	0.127	0.121	0.116	0.115	0.140

TABLE A1. Continued

Good name	Good categories					ERPT into prices			ERPT into income loss			ERPT into welfare loss			Expenditure weights (%)						
	Sector code	Traded	Durable	Flexible-Price	Income-Elastic	Median	Lower	Upper	Median	Lower	Upper	Median	Lower	Upper	P.A.	C.A.	Q#1	Q#2	Q#3	Q#4	Q#5
Maid and cleaners' fee	5	0	0	1	1	−0.105	−0.192	−0.003	0.331	0.152	0.528	0.227	0.047	0.438	0.607	0.584	0.498	0.476	0.454	0.451	0.551
Carpet and other floor coverings cleanings	5	0	0	0	1	0.066	−0.055	0.177	0.324	0.127	0.550	0.387	0.211	0.594	0.078	0.075	0.064	0.061	0.058	0.058	0.071
Medicines	6	1	0	0	0	−0.377	−0.842	−0.019	0.363	0.191	0.553	−0.034	−0.521	0.406	0.646	0.668	0.749	0.642	0.589	0.526	0.522
Other health items	6	1	0	0	0	3.391	1.160	6.574	0.336	0.154	0.557	3.719	1.524	6.866	0.087	0.090	0.101	0.087	0.080	0.071	0.070
Corrective eye-glasses	6	1	0	0	0	0.888	0.630	1.224	0.319	0.138	0.521	1.214	0.886	1.668	0.138	0.143	0.160	0.137	0.126	0.113	0.112
Contact lense	6	1	0	0	0	0.545	0.391	0.731	0.335	0.165	0.499	0.879	0.650	1.140	0.013	0.014	0.015	0.013	0.012	0.011	0.011
Therapeutic appliances	6	1	0	1	0	0.583	0.239	0.895	0.336	0.150	0.537	0.925	0.535	1.301	0.096	0.100	0.112	0.096	0.088	0.079	0.078
Fees paid to specialist doctor	6	0	0	1	1	1.045	0.078	2.124	0.339	0.134	0.531	1.384	0.407	2.499	0.627	0.567	0.437	0.432	0.549	0.491	0.562
Dentist fee (Pulling)	6	0	0	0	1	−0.383	−1.113	0.274	0.355	0.160	0.562	−0.005	−0.802	0.658	0.189	0.171	0.132	0.130	0.166	0.148	0.170
Dentist fee (Filling)	6	0	0	1	1	−0.287	−1.090	0.319	0.354	0.161	0.574	0.061	−0.795	0.747	0.456	0.412	0.318	0.314	0.399	0.357	0.408
X-ray fee	6	0	0	0	1	−0.911	−2.560	0.167	0.340	0.170	0.543	−0.578	−2.154	0.578	0.042	0.038	0.029	0.029	0.037	0.033	0.038
Laboratory analysis fee	6	0	0	0	1	−0.563	−1.976	0.624	0.335	0.156	0.572	−0.242	−1.650	1.019	0.197	0.178	0.137	0.136	0.172	0.154	0.176
Hospital bed fee	6	0	0	0	1	−0.879	−1.634	−0.212	0.354	0.176	0.552	−0.509	−1.358	0.232	0.053	0.057	0.045	0.054	0.040	0.053	0.049
Surgical operation fee	6	0	0	0	1	−0.152	−0.639	0.258	0.348	0.181	0.545	0.198	−0.347	0.679	0.402	0.427	0.336	0.408	0.302	0.395	0.365
Natural childbirth fee	6	0	0	1	1	−0.301	−1.159	0.491	0.341	0.171	0.547	0.063	−0.903	0.874	0.021	0.023	0.018	0.022	0.016	0.021	0.019
Cesarean section fee	6	0	0	0	1	−0.148	−0.639	0.191	0.343	0.174	0.551	0.190	−0.310	0.588	0.088	0.093	0.073	0.089	0.066	0.086	0.080
Automobile (Gasoline)	7	1	1	1	1	0.771	0.501	1.088	0.354	0.182	0.556	1.127	0.877	1.428	3.053	5.479	4.074	6.241	9.241	12.247	17.551
Bicycle	7	1	1	0	1	0.523	0.189	0.887	0.339	0.169	0.542	0.867	0.434	1.346	0.055	0.099	0.073	0.113	0.167	0.221	0.316
Spare parts and accessories	7	1	1	1	1	3.419	2.128	5.061	0.332	0.163	0.543	3.766	2.557	5.318	0.470	0.401	0.229	0.272	0.313	0.378	0.382
Products for maintanence of transport equipments	7	1	0	1	1	2.687	1.652	4.276	0.351	0.157	0.563	3.051	2.075	4.624	0.021	0.018	0.010	0.012	0.014	0.017	0.017

TABLE A1. Continued

Good name	Sector code	Traded	Durable	Flexible-Price	Income-Elastic	ERPT into prices Median	Lower	Upper	ERPT into income loss Median	Lower	Upper	ERPT into welfare loss Median	Lower	Upper	Expenditure weights (%) P.A.	C.A.	Q#1	Q#2	Q#3	Q#4	Q#5
Petrol	7	1	0	0	1	0.201	−0.059	0.484	0.362	0.178	0.570	0.573	0.262	0.911	2.146	1.832	1.047	1.241	1.428	1.724	1.745
Liquid petroleum gas (LPG)	7	1	0	0	1	−0.101	−0.381	0.182	0.338	0.146	0.564	0.246	−0.036	0.545	1.750	1.494	0.854	1.012	1.164	1.406	1.423
Diesel	7	1	0	0	1	0.046	−0.266	0.347	0.347	0.164	0.545	0.375	0.076	0.732	2.402	2.051	1.172	1.390	1.598	1.930	1.953
Motor oil	7	1	0	1	1	1.176	0.644	1.930	0.339	0.152	0.543	1.522	0.881	2.390	0.029	0.025	0.014	0.017	0.019	0.023	0.023
Maintenance and repairs equipment and service for vehicle	7	0	0	1	1	0.555	0.232	1.158	0.344	0.152	0.549	0.930	0.552	1.508	0.861	0.735	0.420	0.498	0.573	0.692	0.700
Maintenance and repairs service for vehicle	7	0	0	1	1	−0.203	−0.502	0.042	0.339	0.163	0.568	0.132	−0.151	0.440	0.258	0.220	0.126	0.149	0.172	0.207	0.210
Hire of car fee	7	0	0	0	1	−0.120	−0.381	0.110	0.359	0.167	0.556	0.239	−0.093	0.555	0.108	0.093	0.053	0.063	0.072	0.087	0.088
Car park fee	7	0	0	0	1	−0.262	−0.489	−0.018	0.337	0.153	0.547	0.093	−0.149	0.332	0.060	0.051	0.029	0.035	0.040	0.048	0.049
Highway toll	7	0	0	0	1	0.134	−0.087	0.384	0.337	0.154	0.559	0.484	0.207	0.789	0.004	0.003	0.002	0.002	0.003	0.003	0.003
Bridge fare	7	0	0	0	1	1.562	1.008	2.330	0.334	0.157	0.539	1.912	1.312	2.735	0.002	0.002	0.001	0.001	0.002	0.002	0.002
Driver course fare	7	0	0	0	1	0.347	−0.363	1.065	0.359	0.151	0.565	0.712	−0.002	1.447	0.135	0.115	0.066	0.078	0.090	0.108	0.110
Train fare (inter-urban)	7	0	0	0	0	−0.373	−0.646	−0.134	0.342	0.156	0.571	−0.032	−0.367	0.312	0.004	0.005	0.004	0.004	0.004	0.004	0.004
Underground fare	7	0	0	0	0	−0.258	−0.404	−0.119	0.333	0.156	0.529	0.082	−0.120	0.277	0.003	0.004	0.003	0.003	0.003	0.003	0.003
Train fare (intra-urban)	7	0	0	0	0	−0.031	−0.272	0.208	0.336	0.153	0.553	0.309	0.015	0.638	0.024	0.025	0.023	0.022	0.023	0.024	0.019
City bus fare(inter-urban)	7	0	0	0	0	−0.159	−0.286	−0.046	0.331	0.150	0.540	0.163	−0.041	0.404	0.165	0.175	0.158	0.154	0.158	0.163	0.133
Mini bus fare	7	0	0	0	0	−0.118	−0.293	0.035	0.319	0.132	0.529	0.198	0.013	0.411	1.474	1.558	1.411	1.377	1.413	1.452	1.183
Transportation service	7	0	0	0	0	0.145	−0.012	0.329	0.341	0.157	0.554	0.504	0.270	0.766	0.915	0.968	0.877	0.856	0.878	0.902	0.735
Taxi fare	7	0	0	0	0	0.013	−0.163	0.187	0.338	0.137	0.542	0.350	0.100	0.621	0.354	0.374	0.339	0.330	0.339	0.348	0.284
Bus fare (intra-urban)	7	0	0	1	0	−0.018	−0.155	0.097	0.338	0.155	0.547	0.311	0.132	0.519	0.773	0.818	0.740	0.723	0.741	0.762	0.621
Airplane fare	7	0	0	1	0	2.000	1.258	2.864	0.342	0.173	0.548	2.348	1.648	3.194	0.537	0.568	0.514	0.502	0.515	0.529	0.431
Boat fare	7	0	0	0	0	0.430	0.061	0.838	0.340	0.155	0.556	0.782	0.392	1.219	0.046	0.049	0.044	0.043	0.044	0.046	0.037

TABLE A1. Continued

Good name	Sector code	Traded	Durable	Flexible-Price	Income-Elastic	ERPT into prices Median	Lower	Upper	ERPT into income loss Median	Lower	Upper	ERPT into welfare loss Median	Lower	Upper	P.A.	C.A.	Q#1	Q#2	Q#3	Q#4	Q#5
Cargo fee	7	0	0	0	0	0.090	−0.120	0.315	0.349	0.187	0.538	0.440	0.237	0.702	0.025	0.027	0.024	0.024	0.024	0.025	0.020
Transportation fee	7	0	0	1	0	−0.305	−0.544	−0.106	0.366	0.181	0.549	0.055	−0.182	0.297	0.129	0.137	0.124	0.121	0.124	0.127	0.104
Payment for delivery of parcell	8	0	0	0	1	0.264	−0.338	0.792	0.326	0.142	0.542	0.586	0.048	1.103	0.002	0.002	0.002	0.001	0.002	0.002	0.003
Phone machine	8	1	1	1	1	2.016	1.324	2.832	0.359	0.202	0.542	2.396	1.773	3.161	0.853	0.930	0.336	0.682	0.961	0.805	0.847
Spare parts for telehone (SIM card, battery)	8	1	1	0	1	0.490	−0.138	1.082	0.334	0.161	0.530	0.817	0.128	1.490	0.054	0.059	0.021	0.043	0.061	0.051	0.054
Repair of phone machines	8	0	0	0	1	0.576	0.117	1.104	0.355	0.176	0.566	0.929	0.532	1.434	0.048	0.052	0.019	0.038	0.054	0.045	0.047
Fee for phone calls	8	0	0	0	0	9.386	4.645	15.497	0.350	0.147	0.560	9.759	5.048	15.903	0.336	0.335	0.263	0.303	0.308	0.311	0.260
Fee for cellular phone calls	8	0	0	0	0	3.676	0.428	6.581	0.338	0.184	0.517	4.018	0.886	6.917	2.653	2.648	2.076	2.395	2.430	2.457	2.051
Subscription costs of telephone	8	0	0	0	0	0.226	−0.001	0.479	0.335	0.169	0.524	0.561	0.289	0.888	0.009	0.009	0.007	0.008	0.008	0.009	0.007
Fee for internet connection	8	0	0	0	0	−2.896	−4.278	−1.806	0.368	0.184	0.573	−2.528	−3.856	−1.401	0.721	0.719	0.564	0.651	0.660	0.668	0.557
Television	9	1	1	1	1	1.539	0.771	2.378	0.316	0.134	0.517	1.881	1.007	2.793	0.723	0.583	0.499	0.454	0.564	0.498	0.506
Camera	9	1	1	0	1	3.093	2.211	4.332	0.349	0.170	0.563	3.451	2.519	4.768	0.030	0.024	0.021	0.019	0.023	0.021	0.021
PC and Laptop	9	1	1	0	1	1.545	1.254	1.923	0.318	0.159	0.515	1.887	1.505	2.348	0.232	0.187	0.160	0.146	0.181	0.160	0.162
PC equipments	9	1	1	1	1	0.122	−0.728	0.880	0.340	0.169	0.559	0.477	−0.439	1.323	0.051	0.041	0.035	0.032	0.039	0.035	0.035
Maintenance and repairs for audio-visiual equipments-equipment and service	9	0	0	0	1	−0.522	−0.898	−0.180	0.354	0.153	0.569	−0.165	−0.642	0.261	0.030	0.024	0.021	0.019	0.024	0.021	0.021
Maintenance and repairs for audio-visiual equipments-service	9	0	0	0	1	−0.170	−0.910	0.483	0.345	0.162	0.538	0.160	−0.659	0.916	0.014	0.011	0.010	0.009	0.011	0.010	0.010
Music equipment (flute)	9	1	1	0	1	1.426	1.070	2.037	0.336	0.140	0.547	1.780	1.350	2.458	0.031	0.043	0.004	0.012	0.020	0.017	0.070

TABLE A1. Continued

Good name	Good categories					ERPT into prices			ERPT into income loss			ERPT into welfare loss			Expenditure weights (%)						
	Sector code	Traded	Durable	Flexible-Price	Income-Elastic	Median	Lower	Upper	Median	Lower	Upper	Median	Lower	Upper	P.A.	C.A.	Q#1	Q#2	Q#3	Q#4	Q#5
Children's toys	9	1	1	1	1	0.727	0.440	1.187	0.337	0.148	0.557	1.093	0.762	1.582	0.147	0.182	0.113	0.170	0.205	0.273	0.346
Items for sport and recreation (soccer ball)	9	1	1	0	1	1.212	0.859	1.729	0.313	0.110	0.537	1.538	1.137	2.095	0.128	0.158	0.098	0.147	0.178	0.237	0.300
Veterinary fee	9	0	0	1	1	0.477	0.361	0.630	0.350	0.171	0.548	0.838	0.642	1.076	0.028	0.035	0.021	0.032	0.039	0.052	0.066
Fee paid for watching sport games (football)	9	0	0	0	1	2.074	0.347	3.794	0.339	0.158	0.544	2.387	0.676	4.222	0.062	0.058	0.016	0.028	0.036	0.060	0.071
Renting of mini football fields	9	0	0	1	1	0.136	−0.017	0.331	0.307	0.125	0.516	0.458	0.240	0.734	0.669	0.624	0.174	0.300	0.387	0.643	0.768
Fee paid for having pictures taken	9	0	0	0	1	0.200	0.123	0.296	0.335	0.156	0.565	0.540	0.349	0.778	0.054	0.051	0.014	0.024	0.031	0.052	0.062
Cable TV service fee	9	0	0	0	1	0.357	−1.049	1.723	0.344	0.150	0.585	0.737	−0.732	2.094	0.242	0.226	0.063	0.109	0.140	0.233	0.278
Cinema	9	0	0	0	1	0.108	0.048	0.174	0.313	0.140	0.530	0.426	0.216	0.667	0.078	0.073	0.020	0.035	0.045	0.075	0.090
Theather	9	0	0	0	1	−0.427	−0.712	−0.169	0.347	0.175	0.539	−0.075	−0.278	0.110	0.009	0.009	0.002	0.004	0.005	0.009	0.011
Other recreational and cultural services (Internet cafe)	9	0	0	0	1	1.053	0.646	1.674	0.322	0.138	0.537	1.407	0.948	2.020	0.031	0.029	0.008	0.014	0.018	0.030	0.035
Children books	9	1	1	0	1	−0.315	−0.648	−0.024	0.353	0.153	0.539	0.015	−0.374	0.442	0.045	0.043	0.030	0.046	0.045	0.044	0.050
Other books	9	1	1	0	1	−0.259	−0.516	0.024	0.355	0.178	0.569	0.104	−0.222	0.438	0.164	0.157	0.110	0.170	0.166	0.162	0.184
Newspapers	9	1	0	0	1	0.490	0.232	0.793	0.326	0.144	0.542	0.835	0.400	1.291	0.068	0.065	0.046	0.070	0.069	0.067	0.076
Magazines	9	1	0	0	1	0.646	0.211	1.064	0.352	0.176	0.562	1.010	0.541	1.471	0.021	0.020	0.014	0.022	0.022	0.021	0.024
Notebook	9	1	0	0	1	1.324	1.012	1.827	0.345	0.149	0.571	1.708	1.356	2.200	0.058	0.055	0.039	0.060	0.059	0.057	0.065
Pencil	9	1	0	0	1	0.663	0.506	0.855	0.350	0.161	0.568	1.033	0.769	1.307	0.055	0.052	0.037	0.057	0.056	0.054	0.062
Box of coloured pencils for painting	9	1	0	0	1	0.790	0.591	1.039	0.315	0.143	0.539	1.124	0.845	1.483	0.034	0.032	0.023	0.035	0.034	0.034	0.038
Stationery papers	9	1	0	0	1	−4.949	−8.935	−1.706	0.381	0.198	0.594	−4.569	−8.508	−1.240	0.015	0.014	0.010	0.015	0.015	0.015	0.016
Other stationery	9	1	0	0	1	0.963	0.134	1.873	0.344	0.164	0.547	1.292	0.450	2.284	0.071	0.068	0.048	0.073	0.072	0.070	0.079
Package holidays weekend	9	0	0	0	1	−0.188	−0.569	0.174	0.333	0.147	0.538	0.131	−0.221	0.523	0.021	0.022	0.016	0.035	0.026	0.028	0.042
Package holidays for one week and more	9	0	0	0	1	0.863	0.691	1.075	0.329	0.134	0.502	1.191	0.934	1.473	0.047	0.047	0.035	0.078	0.057	0.062	0.092

TABLE A1. Continued

Good name	Good categories					ERPT into prices			ERPT into income loss			ERPT into welfare loss			Expenditure weights (%)						
	Sector code	Traded	Durable	Flexible-Price	Income-Elastic	Median	Lower	Upper	Median	Lower	Upper	Median	Lower	Upper	P.A.	C.A.	Q#1	Q#2	Q#3	Q#4	Q#5
Package holidays (abroad)	9	0	0	1	1	0.185	−0.291	0.607	0.334	0.140	0.548	0.525	0.098	0.899	0.026	0.026	0.019	0.042	0.031	0.034	0.050
The pilgrimage to Mecca	9	0	0	0	1	1.094	0.805	1.436	0.338	0.166	0.545	1.453	1.107	1.867	0.199	0.200	0.148	0.329	0.242	0.264	0.388
Kindergarten fees	10	0	0	0	1	0.239	0.064	0.440	0.337	0.153	0.540	0.583	0.276	0.910	0.370	0.307	0.044	0.073	0.114	0.149	0.505
Private school fees (primary)	10	0	0	0	1	0.038	−0.027	0.103	0.353	0.178	0.561	0.392	0.220	0.592	0.554	0.460	0.066	0.110	0.171	0.223	0.756
Private school fees (secondary)	10	0	0	0	1	−0.086	−0.544	0.427	0.341	0.173	0.540	0.266	−0.207	0.821	0.972	1.040	0.234	0.341	0.473	0.652	1.535
University fee	10	0	0	0	1	−0.348	−1.031	0.278	0.358	0.171	0.559	−0.015	−0.700	0.702	0.238	0.230	0.315	0.233	0.481	0.652	1.301
Courses for non-determined education level	10	0	0	0	1	0.358	0.228	0.498	0.387	0.223	0.606	0.767	0.551	0.994	0.336	0.225	0.090	0.068	0.108	0.240	0.264
Soups	11	0	0	0	1	−0.024	−0.093	0.050	0.353	0.188	0.575	0.340	0.150	0.563	0.257	0.266	0.201	0.230	0.235	0.269	0.270
Cold meals	11	0	0	1	1	0.101	0.021	0.190	0.349	0.178	0.527	0.448	0.291	0.626	1.258	1.306	0.983	1.128	1.152	1.316	1.323
Broiled meat (kebap)	11	0	0	1	1	−0.018	−0.120	0.072	0.333	0.162	0.529	0.313	0.128	0.525	1.069	1.110	0.835	0.958	0.979	1.118	1.125
Flat bread (pide, lahmacun)	11	0	0	1	1	0.093	−0.042	0.250	0.343	0.174	0.542	0.438	0.249	0.691	0.755	0.784	0.590	0.677	0.692	0.790	0.795
Doner in bread	11	0	0	1	1	0.272	0.113	0.510	0.343	0.154	0.541	0.631	0.366	0.981	0.933	0.969	0.729	0.837	0.855	0.977	0.982
Hamburger and sandwiches	11	0	0	0	1	0.444	0.251	0.746	0.348	0.166	0.571	0.798	0.557	1.177	0.825	0.857	0.645	0.740	0.756	0.863	0.868
Patisserie products served	11	0	0	0	1	0.249	0.121	0.408	0.334	0.169	0.529	0.600	0.415	0.817	0.325	0.337	0.254	0.291	0.297	0.340	0.342
Hot drinks served	11	0	0	0	1	0.582	0.313	0.930	0.341	0.166	0.541	0.932	0.639	1.319	1.056	1.096	0.825	0.947	0.967	1.105	1.111
Cold drinks served	11	0	0	0	1	0.066	0.005	0.134	0.349	0.168	0.557	0.426	0.262	0.606	0.057	0.059	0.045	0.051	0.052	0.060	0.060
Ayran served	11	0	0	0	1	0.260	0.108	0.426	0.334	0.175	0.526	0.606	0.437	0.813	0.101	0.105	0.079	0.090	0.092	0.105	0.106
Raki and beer served	11	0	0	1	1	0.084	−0.097	0.279	0.343	0.149	0.544	0.435	0.219	0.666	0.162	0.168	0.127	0.145	0.148	0.170	0.170
Hotel charge	11	0	0	1	1	0.474	0.061	0.937	0.323	0.147	0.521	0.787	0.432	1.235	0.686	0.501	0.064	0.174	0.246	0.343	0.721
Accomodations services of boarding universities	11	0	0	0	1	−0.227	−0.443	−0.014	0.334	0.157	0.553	0.115	−0.193	0.467	0.445	0.325	0.041	0.113	0.160	0.223	0.468

TABLE A1. Continued

Good name	Sector code	Traded	Durable	Flexible-Price	Income-Elastic	ERPT into prices			ERPT into income loss			ERPT into welfare loss			Expenditure weights (%)						
						Median	Lower	Upper	Median	Lower	Upper	Median	Lower	Upper	P.A.	C.A.	Q#1	Q#2	Q#3	Q#4	Q#5
Men's hairdressing	12	0	0	1	1	0.030	−0.071	0.131	0.350	0.167	0.552	0.378	0.209	0.571	0.409	0.352	0.282	0.333	0.313	0.299	0.315
Women's hairdressing	12	0	0	1	1	−0.097	−0.195	0.019	0.349	0.171	0.551	0.260	0.076	0.453	0.312	0.269	0.215	0.254	0.239	0.228	0.241
Manicures and beauty service	12	0	0	1	1	0.148	−0.053	0.353	0.362	0.199	0.569	0.526	0.314	0.742	0.181	0.156	0.125	0.148	0.139	0.132	0.140
Hair care appliances	12	1	0	1	1	−0.094	−0.255	0.047	0.324	0.153	0.530	0.228	0.014	0.458	0.051	0.044	0.035	0.041	0.039	0.037	0.039
Shaving articles	12	1	0	0	1	0.205	−0.084	0.506	0.323	0.155	0.501	0.511	0.170	0.953	0.058	0.050	0.040	0.047	0.044	0.042	0.044
Articles for dental hygiene	12	1	0	0	1	0.591	0.234	1.136	0.347	0.161	0.558	0.950	0.585	1.468	0.127	0.110	0.088	0.104	0.097	0.093	0.098
Toilet soap	12	1	0	1	1	1.023	0.609	1.653	0.352	0.184	0.546	1.379	0.976	2.061	0.099	0.085	0.068	0.081	0.076	0.072	0.076
Bath soap	12	1	0	0	1	1.276	0.874	1.768	0.329	0.165	0.545	1.628	1.166	2.162	0.039	0.034	0.027	0.032	0.030	0.029	0.030
Perfume	12	1	0	1	1	3.253	1.890	5.572	0.336	0.144	0.549	3.598	2.192	5.958	0.133	0.114	0.091	0.108	0.101	0.097	0.102
Deodorants	12	1	0	1	1	1.393	0.940	2.192	0.345	0.160	0.554	1.766	1.226	2.582	0.038	0.032	0.026	0.031	0.029	0.027	0.029
Cologne	12	1	0	0	1	1.061	0.652	1.884	0.358	0.179	0.534	1.478	0.961	2.308	0.027	0.023	0.019	0.022	0.021	0.020	0.021
Body cream and lotion	12	1	0	0	1	0.718	0.427	1.170	0.332	0.139	0.528	1.078	0.713	1.586	0.180	0.155	0.124	0.146	0.137	0.131	0.139
Make-up products	12	1	0	1	1	−0.405	−0.923	−0.034	0.337	0.174	0.513	−0.087	−0.583	0.335	0.090	0.078	0.062	0.073	0.069	0.066	0.070
Hair care products	12	1	0	1	1	1.180	0.796	1.743	0.334	0.163	0.518	1.532	1.138	2.091	0.318	0.274	0.219	0.259	0.243	0.232	0.245
Toilet paper	12	1	0	0	1	0.951	0.349	1.576	0.345	0.176	0.544	1.285	0.649	1.988	0.180	0.154	0.124	0.146	0.137	0.131	0.138
Baby napkin	12	1	0	0	1	0.774	0.593	1.008	0.334	0.147	0.572	1.128	0.876	1.454	0.438	0.376	0.301	0.356	0.334	0.319	0.337
Hygiene pad for women	12	1	0	0	1	0.960	0.468	1.875	0.334	0.159	0.538	1.322	0.863	2.238	0.064	0.055	0.044	0.052	0.049	0.046	0.049
Jewellery (Gold)	12	1	1	1	1	0.978	0.475	1.542	0.349	0.163	0.554	1.334	0.832	1.932	1.371	1.462	0.421	1.963	0.809	1.199	1.695
Travel goods	12	1	0	1	1	0.367	0.094	0.662	0.337	0.150	0.572	0.720	0.360	1.127	0.099	0.105	0.030	0.141	0.058	0.086	0.122
School bag	12	1	0	1	1	0.527	0.326	0.820	0.310	0.144	0.521	0.866	0.600	1.214	0.155	0.166	0.048	0.223	0.092	0.136	0.192

TABLE A1. Continued

Good name	Good categories					ERPT into prices			ERPT into income loss			ERPT into welfare loss			Expenditure weights (%)						
	Sector code	Traded	Durable	Flexible-Price	Income-Elastic	Median	Lower	Upper	Median	Lower	Upper	Median	Lower	Upper	P.A.	C.A.	Q#1	Q#2	Q#3	Q#4	Q#5
Umbrella	12	1	0	1	1	0.379	0.260	0.527	0.320	0.136	0.522	0.698	0.447	1.006	0.023	0.025	0.007	0.033	0.014	0.020	0.029
Créche and day-care center	12	0	0	1	1	0.117	0.015	0.217	0.357	0.178	0.577	0.480	0.304	0.689	0.214	0.216	0.005	0.066	0.143	0.143	0.306
Insurance connected with fire, burglary and natural disasters	12	0	0	0	1	0.905	0.191	1.675	0.369	0.177	0.592	1.273	0.559	2.117	0.015	0.046	0.010	0.022	0.035	0.033	0.057
Insurance connected with health	12	0	0	0	1	0.286	−0.031	0.616	0.340	0.150	0.551	0.641	0.258	1.037	0.044	0.136	0.029	0.064	0.105	0.098	0.168
Insurance connected with transport	12	0	0	0	1	0.193	−0.223	0.602	0.320	0.139	0.523	0.514	0.053	0.985	0.138	0.424	0.091	0.199	0.325	0.304	0.524
Banking service	12	0	0	0	1	1.043	0.700	1.421	0.373	0.185	0.574	1.417	1.003	1.876	0.010	0.009	0.006	0.008	0.004	0.004	0.013
Fees for legal service	12	0	0	0	1	0.631	−0.205	1.620	0.338	0.163	0.550	0.974	0.107	1.979	0.351	0.560	0.458	0.698	0.526	0.605	0.506
Fees for transportation vehicle	12	0	0	0	1	0.061	−0.057	0.189	0.352	0.167	0.550	0.418	0.200	0.634	0.159	0.255	0.208	0.317	0.239	0.275	0.230
Payment for photocopies	12	0	0	0	1	0.541	0.159	1.020	0.341	0.166	0.552	0.892	0.432	1.412	0.026	0.042	0.035	0.053	0.040	0.046	0.038

Notes: Sector names corresponding to each sector code are given in Table 3. Traded takes a value of 1 (0) for traded (nontraded) goods. Durable takes a value of 1 (0) for durable (nondurable) goods. Flexible-Price takes a value of 1 (0) goods that have a monthly frequency of price change higher (lower) than 0.5. Income-Elastic takes a value of 1 (0) for goods that are consumed more (less) by income quintile #5 compared to #1, where quintiles of Q#1-5 represent income groups ranked from the lowest to the highest. Published average (P.A.) represents expenditure share of goods for the average-income consumer that are downloaded from Turkish Statistical Institute, while constructed average (C.A.) represents expenditure share of goods for the average-income consumer that have been constructed by using the weighted-average of quintiles. For each good, long-run ERPT estimates correspond to the cumulative impulse response of the good-level prices, income loss or welfare loss after 60 months divided by the corresponding cumulative impulse response of the exchange rate following an exchange rate shock in a good-specific structural VAR estimation with three variables of industrial production, exchange rate, and good-level price.

As is evident, welfare calculations further need the information on Δp^g (changes in the aggregate price level for income group g). This can be achieved by calculating the elasticity of P^g with respect to exchange rate using equation (3) as follows:

$$\frac{\partial P^g}{\partial E} \frac{E}{P^g} = \frac{E}{P^g} \frac{1}{1-\sigma} \frac{\left(\sum_i \beta_i^g (P_i)^{1-\sigma}\right)^{\frac{1}{1-\sigma}}}{\sum_i \beta_i^g (P_i)^{1-\sigma}} \left(\sum_i \frac{(1-\sigma)}{P_i} \beta_i^g (P_i)^{1-\sigma} \left(\frac{\partial P_i}{\partial E}\right)\right), \tag{A9}$$

which can be simplified as follows:

$$\frac{\partial P^g}{\partial E} \frac{E}{P^g} = \frac{\sum_i \beta_i^g (P_i)^{1-\sigma} \left(\frac{\partial P_i}{\partial E} \frac{E}{P_i}\right)}{\sum_i \beta_i^g (P_i)^{1-\sigma}}. \tag{A10}$$

Using equation (5), this can be rewritten as follows:

$$\frac{\partial P^g}{\partial E} \frac{E}{P^g} = \sum_i W_i^g \left(\frac{\partial P_i}{\partial E} \frac{E}{P_i}\right), \tag{A11}$$

where $\sum_i W_i^g = 1$ has also been used (since expenditure weights add up to one). In log changes, this expression can further be written as follows:

$$\frac{\Delta p^g}{\Delta e} = \sum_i W_i^g \left(\frac{\Delta p_i}{\Delta e}\right). \tag{A12}$$

It is implied that an expression can be found for the elasticity of welfare with respect to exchange rate using equations (A5), (A8), and (A12) as follows:

$$\frac{\Delta c^g}{\Delta e} = \sum_i W_i^g \left(-\sigma \frac{\Delta p_i}{\Delta e} - (1-\sigma) \frac{\Delta p^g}{\Delta e} + \frac{\Delta y^g}{\Delta e}\right), \tag{A13}$$

which can be rewritten as follows:

$$\frac{\Delta c^g}{\Delta e} = -\sigma \sum_i W_i^g \frac{\Delta p_i}{\Delta e} + (\sigma - 1) \sum_i W_i^g \left(\frac{\Delta p_i}{\Delta e}\right) + \sum_i W_i^g \frac{\Delta y^g}{\Delta e}, \tag{A14}$$

where $\sum_i W_i^g = 1$ has also been used (since expenditure weights add up to one). It is finally implied that:

$$\frac{\Delta c^g}{\Delta e} = \sum_i W_i^g \frac{\Delta y^g}{\Delta e} - \sum_i W_i^g \left(\frac{\Delta p_i}{\Delta e}\right), \tag{A15}$$

which is (negative of) the expression used in the main text for welfare calculations (that is independent of the value of σ).