

APPENDIX TO:  
FISCAL POLICY, RELATIVE PRICES AND  
NET EXPORTS IN A CURRENCY UNION\*  
For Online Publication

Luisa Lambertini  
EPFL †

Christian Proebsting  
EPFL‡

February 20, 2020

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\*Lambertini: [Luisa.Lambertini@epfl.ch](mailto:Luisa.Lambertini@epfl.ch); Proebsting: [Christian.Proebsting@epfl.ch](mailto:Christian.Proebsting@epfl.ch)

†École Polytechnique Fédérale de Lausanne

‡École Polytechnique Fédérale de Lausanne

# A Data

## A.1 Price Inflation Data

Price inflation data is provided by Eurostat and covers all countries in the European Union. Eurostat publishes two price indices, the Harmonized Index of Consumer Prices (HICP) and the HICP at constant tax rates. The HICP is the European counterpart of the CPI (calculated by the BLS) and implements a common methodology in all European Union memberstates. The HICP is a Laspeyres index with weights being updated at an annual frequency. The HICP is divided into  $J = 90$  categories (COICOP level 4). Let  $P_{n,t}$  be the HICP in country  $n$  at time  $t$ . It is defined as follows:

$$P_{n,t}^{ret} = \sum_j \nu_{j,n,t} P_{j,n,t}^{ret}$$

where  $P_{j,n,t}^{ret} = P_{j,n,t}(1 + \tau_{j,n,t}^c)$  is the retail price of good  $j$  in country  $n$  at time  $t$  relative to a base year,  $\tau_{j,n,t}^c$  is the corresponding ad-valorem net tax rate relative to a base year tax rate and  $\nu_{j,n,t}$  is the weight with  $\sum_j \nu_{j,n,t} = 1$ .

The HICP at constant tax rates subtracts any changes in consumption tax rates from the HICP:

$$P_{n,t} = \sum_j \nu_{j,n,t} P_{j,n,t}$$

**Imputation.** This HICP at constant tax rates is provided by Eurostat at the overall level and for five main categories since 2003, and at the detailed level for most countries since 2006.<sup>1</sup> We impute missing values in two different ways: First, we impute the index at the detailed level by assuming that tax changes have been the same across all categories within a common main category. Let  $p(j)$  index the main category that good  $j$  belongs to. Further suppose that the price index for good  $j$  is available at time  $t$ , but only the price index for the main category  $p(j)$  is available at time  $s$ . Then, we calculate the tax rate of good  $j$  at time  $s$

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<sup>1</sup>These five main categories are 'Processed food including alcohol and tobacco', 'Unprocessed food', 'Non-energy industrial goods', 'Energy', 'Services'

as follows:

$$1 + \tau_{j,n,s}^c = (1 + \tau_{j,n,t}^c) \frac{1 + \tau_{j,n,s}^c}{1 + \tau_{p(j),n,t}^c},$$

and the price index at constant tax rates is simply the ratio of the price index (including taxes) and the tax rate:  $P_{j,n,s} = \frac{P_{j,n,s}(1+\tau_{j,n,s}^c)}{1+\tau_{j,n,s}^c}$ .

Second, if some data is still missing, we use data on value-added tax changes by country, month and COICOP categories collected by Benedek et al. (2015), as well as data collected by ourselves based on information provided by the statistical agencies.

## A.2 More Details on Import Shares by COICOP category

Up to a first-order approximation, overall consumption in country  $n$  at time  $t$  can be disaggregated as follows

$$\tilde{C}_{n,t} = \sum_j \nu_{j,n} \tilde{c}_{n,t}^j$$

where  $c_{n,t}^j$  is consumption of good  $j$  in country  $n$  at time  $t$  and  $\nu_{j,n,t}$  is the weight of good  $j$  with  $\sum_j \nu_{j,n,t} = 1$ .  $\tilde{x}_t$  refers to the percent deviation of variable  $x$  from its steady state. Consumption goods are classified into  $J = 90$  categories such as 'Fish and seafood', 'Wine' and 'Maintenance and repair of personal transport equipment'. This corresponds to the level 4 division of Classification of individual consumption by purpose (COICOP).

We view these goods as being produced by combining inputs indexed by  $s = 1, \dots, S$ , originating from countries  $i = 1, \dots, N$ . 'Wine', for example, is produced by combining 'Wine from grape', potentially produced domestically and / or imported, with domestic 'Distribution services'. Denoting  $y_{n,t}^{s,j,i}$  the amount of input  $s$  from country  $i$  in the production of good  $j$  in country  $n$  at time  $t$ , we can write consumption of good  $j$  in country  $n$  at time  $t$  as

$$\tilde{c}_{n,t}^j = \sum_{s=1}^S a_{j,n}^s \sum_{i=1}^N \omega_n^{s,i} \tilde{y}_{n,t}^{s,j,i} \quad (\text{A.1})$$

Here,  $a_{j,n}^s$  is the cost share of input  $s$  in the production of good  $j$  in country  $n$ . Notice that we allow this technology coefficient to be country-specific. Inputs are produced in potentially all countries with  $\omega_n^{s,i}$  denoting country  $n$ 's expenditure share on input  $s$  from country  $i$  with

$\sum_{i=1}^N \omega_n^{s,i} = 1 \forall s, n$ . The expenditure share on domestically produced inputs is  $\omega_n^{s,n}$ , while the share on imports is  $1 - \omega_n^{s,n}$ .

Consumption goods are commonly classified into tradables and non-tradables in an ad-hoc way or assigning them to industries and then classify them based on how tradable the inputs and outputs of these industries are (see e.g. Crucini et al., 2005; Berka et al., 2018). In contrast, we classify goods following equation (A.1), which takes into account that consumption goods might require inputs from various industries. In particular, for every consumption good  $j$ , we calculate the average import share,  $im_j$ , as a weighted average of the import shares of the underlying inputs,  $s$ , averaged across countries  $n$ :

$$im_j = \frac{1}{N} \sum_n \sum_s a_{j,n}^s (1 - \omega_n^{s,n}), \quad (\text{A.2})$$

We allow import shares of inputs,  $1 - \omega_n^{s,n}$ , to be input- and country-specific.

Our two main data sources are detailed use tables from Statistics Denmark for 2010, national use tables provided by Eurostat as well as the EU-inter country Supply, Use and Input-Output Tables (called FIGARO). Here we provide a few more details.

First, we calculate the input cost shares  $a_{j,DNK}^s$  with  $\sum_s a_{j,DNK}^s = 1$  for the 90 COICOP categories from the use tables provided by Statistics Denmark. We briefly discuss how we create a concordance between product classifications and consumption good classifications used by Statistics Denmark and Eurostat.

Second, we adjust these COICOP-specific input coefficients  $a_{j,n}^s$  for each country  $n$  to be consistent with the aggregate consumption input coefficients derived from the official use tables.

Third, to calculate input-specific import shares,  $\omega_n^{s,i}$ , we rely on both national use tables and the FIGARO tables provided by Eurostat.

### A.2.1 Concordance between Statistics Denmark Categories and Eurostat Categories

It is straightforward to match the products used by Statistics Denmark to those used by Eurostat because both rely on the same classification (CPA 2008). We simply aggregate up the Danish 4-digit level product categories to the 64 2-digit level product categories used by Eurostat.

In terms of consumption groups, Statistics Denmark uses a coarser classification than what

is commonly used for reporting inflation data. Eurostat reports inflation data according to 4-digit level COICOP groups. Statistics Denmark’s classification of consumption groups is based on Eurostat’s COICOP, but sometimes uses more aggregated groups (e.g. the Danish category ‘Regular maintenance and repair of the dwelling’ encompasses Eurostat’s categories ‘CP0431: Materials for maintenance and repair of the dwelling’, and ‘CP0432: Services for maintenance and repair of the dwelling’.) In certain cases, we disaggregate the information into the underlying Eurostat categories by exploiting the details offered on the supply side. For instance, for ‘Regular maintenance and repair of the dwelling’, we assign all supplies provided by the industries ‘Professional repair and maintenance of buildings’ and ‘Own-account repair and maintenance of buildings’ (both forming part of the sector ‘Construction’) to the category ‘CP0432: Services for maintenance and repair of the dwelling’. All supplies provided by the remaining industries (which all form part of the sectors ‘Manufacturing’ or ‘Wholesale and retail trade’) are classified under ‘CP0431: Materials for maintenance and repair of the dwelling’. In some cases, we cannot distinguish between the underlying Eurostat categories. For instance, Statistics Denmark aggregates up the two categories ‘CP0211: Spirits’ and ‘CP0212: Wine’ into a single category. Both products rely on inputs from the beverage industry and from the retail sector. The tables are not disaggregated enough to distinguish between the supplies for ‘Spirits’ as opposed to the supplies for ‘Wine’. In that case, we assume that the input mix and import share are the same across ‘Spirits’ and ‘Wine’.

## A.2.2 Adjusting the Input Coefficients

Data provided by Statistics Denmark allows us to calculate COICOP-specific input coefficients,  $a_{j,DNK}^s$  with  $\sum_s a_{j,DNK}^s = 1$ . Given information on the basket weight for each COICOP category, we can directly calculate the use of each CPA good in households’ consumption.

Although input coefficients are likely to be similar across our sample of (economically) rather homogenous countries, they might differ slightly. As a matter of fact, applying the Danish input coefficients to basket weights from a country other than Denmark, we obtain an implied use of each CPA good in that country’s household consumption, which is inconsistent with data provided by national use tables. To be consistent with these national use tables, we therefore adjust the Danish input coefficients for each country separately. In doing so, we choose the input coefficients for country  $n$ ,  $a_{j,n}^s$ , to be as “similar” as possible to the Danish input coefficients,  $a_{j,DNK}^s$ , while being consistent with country  $n$ ’s national use tables. In

particular, we minimize

$$\min_{a_{j,n}^s} \sum_j \sum_s \frac{1}{2} \frac{(a_{j,DNK}^s - a_{j,n}^s)^2}{k + a_{j,DNK}^s}$$

subject to

$$\begin{aligned} \sum_j^J a_{j,n}^s \nu_{j,n} &= a_{C,n}^s & \forall s \\ \sum_s a_{j,n}^s &= 1 & \forall j = 1, \dots, J \\ a_{j,n}^s &\geq 0 & \forall s, \forall j = 1, \dots, J \\ 1 &\geq a_{j,n}^s & \forall s, \forall j = 1, \dots, J, \end{aligned}$$

with  $k > 0$ .<sup>2</sup> Our loss function specifies our idea of “similarity” between the two matrices. The first constraint describes the constraint imposed by the data on input coefficients for overall consumption: When summing up the input coefficients  $a_{j,n}^s$  for CPA good  $s$  across all consumption categories,  $j$ , weighted by their basket weights,  $\nu_{j,n}$ , we must obtain the input coefficient for overall household consumption,  $a_{C,n}^s$ . The second to fourth constraints are purely technical constraints on the parameters. In practice we set  $k = 0.1$ . This is a simple problem to solve. Let  $\lambda_s$  and  $\lambda_j$  denote the Lagrange multiplier on the first two constraints. We solve for these parameters using the two constraints and setting the preference weights to

$$a_{j,n}^s = \min \left( 1, \max \left[ 0, a_{j,DNK}^s - (k + a_{j,DNK}^s) (\lambda_j + \lambda_s \nu_{j,n}) \right] \right).$$

Two remarks:

- Real estate services: Use tables split up the CPA category 'L68' into 'L68A: Imputed rents of owner-occupied dwellings' and 'L68B: Real estate services excluding imputed rents'. Our consumption data only covers actual rentals (COICOP category CP041). Conceptually, we need to exclude imputed rents of owner-occupied dwellings from our list of CPA goods. For many countries, this means simply dropping category 'L68A' from the input-output tables. For some countries, the use tables do not distinguish between 'L68A' and 'L68B' (they report NaN for 'L68A'). Since the CPA category 'L68' is almost exclusively used for the consumption of category CP041, and category CP041

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<sup>2</sup>Notice that we require  $k > 0$  because elements in  $a_{j,DNK}^s$  might be equal to 0.

only requires CPA category 'L68' as an input, we directly adjust the share of category 'L68' in the use table for aggregate consumption to the basket weight of category CP041.

- Retail and wholesale services: Three countries (Roumania, Cyprus and Luxembourg) report that the CPA category 'G46: Wholesale trade services, except of motor vehicles and motorcycles' is not used for household consumption. It is, however used in other use categories (such as intermediate consumption). In these cases, we replace the input coefficient for household consumption  $a_{C,n}^s$  by the input coefficient for total use,  $a_n^s$ . We proceed similarly for Luxembourg, which reports zero use of the CPA category 'G47: Retail trade services, except of motor vehicles and motorcycles'.

### A.2.3 Constructing Import Shares of Inputs

National use tables on Eurostat report information on a product's origin—whether it is domestically produced or imported—conditional on its use.<sup>3</sup> These tables distinguish between 64 different products. We rely on the national use tables for the year 2010 because all countries in our sample provide data for that specific year. We complement this information with the FIGARO tables that themselves are based on the 2010 national use tables, but break down imports by country of origin. This allows us to calculate the import shares  $\omega_n^{s,i}$  by partner country.

We face two main challenges when using these tables. First, the FIGARO tables report imports at FOB (free on board), whereas the national use tables report imports at CIF (cost, insurances and freight). Typically, for manufactured goods, imports valued at CIF exceed imports valued at FOB, whereas for services, the opposite is true. Second, the FIGARO tables do not report total imports, but only imports stemming from either of the 28 European Union countries. We therefore proceed as follows: If total imports (reported at FOB in the national use tables) is smaller than the sum of EU28 imports (reported at CIF in FIGARO), we adjust total imports up to match the sum of EU28 imports, and set non-EU28 imports to zero.

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<sup>3</sup>Practically, most statistical agencies apply the import proportionality assumption. This assumes that households consume imports of a product proportional to their total consumption of a product and in line with the economy-wide import share of that product. Statistical agencies apply the assumption at different levels of aggregation, with Denmark differentiating between more than 2'000 products.

### A.2.4 Summary Statistics

Table 1 reports summary statistics on the import shares by CPA category. These shares refer to the estimated  $1 - \omega_n^{s,n}$  for various inputs  $s$  and countries  $n$ . Table 2 shows the estimated import shares by COICOP categories, calculated as  $\sum_s a_{j,n}^s (1 - \omega_n^{s,n})$ .

## B Model

### B.1 Pricing to Market

We discuss an extension of the model that allows for pricing to market.

**Producers** In contrast to the model discussed in the main body of the text, we assume that producers of traded goods are monopolistically competitive. They face non-CES demand à la Kimball (1995) for their traded good variety, which gives rise to variable markups and pricing to market. Each producer of traded goods is denoted by  $\iota$  and produces output according to

$$Q_{T,t}(\iota) = (K_{T,t}(\iota))^\alpha (L_{T,t}(\iota))^{1-\alpha}.$$

Variety producers  $[0, \omega]$  produce for the domestic market and variety producers  $[\omega, 1]$  produce for the export market. Given their market power, these firms charge a markup for their products that will naturally depend on the demand curve they face. In particular, profit maximization gives rise to a simple pricing rule with a markup over marginal costs, (which is the same as the marginal cost for producers of non-traded goods, i.e.  $P_{N,t}$ ), given by

$$\mathcal{M}_t(\iota) = \frac{\varepsilon_t(\iota)}{\varepsilon_t(\iota) - 1},$$

where  $\varepsilon_t(\iota)$  is the elasticity of demand that the firm faces in its market.

**Wholesalers** Wholesalers are perfectly competitive in both input and output markets. They purchase varieties of the traded good both at home and abroad to produce a wholesale good,  $V_t$ , according to

$$1 = \int_0^\omega \Upsilon \left( \frac{Q_{T,t}^{dom}(\iota)}{V_t} \right) d\iota + \int_\omega^1 \Upsilon \left( \frac{Q_{T,t}^{imp}(\iota)}{V_t} \right) d\iota. \quad (\text{B.1})$$

Here,  $Q_{T,t}^{dom}(\iota)$  denotes the quantity of the domestically produced variety  $\iota$ ,  $Q_{T,t}^{imp}(\iota)$  is the quantity of the imported variety  $\iota$ ,  $\omega$  is the share of domestic varieties, and  $\Upsilon$  is a Kimball (1995) aggregator. In this setup, the demand for (domestic) variety  $\iota$  is

$$Q_{T,t}^{dom}(\iota) = \Upsilon'^{-1} \left( Z_t \frac{P_{T,t}^{dom}(\iota)}{P_{V,t}} \right) V_t,$$

where  $P_{T,t}^{dom}(\iota)$  is the price associated with  $Q_{T,t}^{dom}(\iota)$ ,  $P_{V,t}$  is the price of the final good produced by the wholesalers and  $Z_t$  is a term that is constant around a symmetric steady state up to a first-order approximation (see Burstein and Gopinath, 2014).

We follow Klenow and Willis (2006) and choose the specification of  $\Upsilon$  such that

$$\Upsilon'^{-1} \left( Z_t \frac{P_{T,t}^{dom}(\iota)}{P_{V,t}} \right) = \left[ 1 - \theta \log \left( Z_t \frac{P_{T,t}^{dom}(\iota)}{P_{V,t}} \right) \right]^{\frac{\psi}{\theta}}.$$

In that case, the elasticity of demand for a specific variety is given by

$$\varepsilon_t(\iota) = - \frac{\partial \log Q_{T,t}^{dom}(\iota)}{\partial \log P_{T,t}^{dom}} = \frac{\psi}{1 - \theta \log \left( Z_t \frac{P_{T,t}^{dom}(\iota)}{P_{V,t}} \right)}.$$

This demand elasticity is constant and equal to  $\psi$  if  $\theta \rightarrow 0$  (which corresponds to the CES case). In a symmetric steady state, where all variety producers charge the same price,  $\psi$  corresponds to the elasticity of substitution between varieties (and therefore has to be larger than 1). Notice that this elasticity also describes the elasticity of substitution between domestic and imported inputs. If  $\theta > 0$ , the demand elasticity is increasing in a variety's relative price  $\frac{P_T^{dom}}{P_V}$ . This implies that variety producers find it optimal to adjust their markup in response to price movements by their competitors. The elasticity of the markup to a relative price change is then (see Burstein and Gopinath, 2014):

$$\Gamma(\iota) = \frac{\theta}{\psi - 1 + \theta \log \left( Z_t \frac{P_{T,t}^{dom}(\iota)}{P_{V,t}} \right)}.$$

When competitors lower their price (i.e. a fall in  $P_{V,t}$ ), the variety producer faces a higher elasticity of demand and responds by reducing their markup. The parameter  $\theta$  controls how quickly the demand elasticity rises in this case and therefore controls the degree of strategic complementarities in pricing.

**Exports** We assume that wholesalers abroad import varieties from the SOE to assemble them with other varieties according to a production function similar to (B.1). Exporting variety producers therefore face a demand curve for their product given by

$$Q_{T,t}^{exp}(\iota) = \Upsilon'^{-1}(P_{X,t}(\iota)) V^*,$$

where  $Q_{T,t}^{exp}(\iota)$  denote exports of variety  $\iota$ ,  $P_{X,t}(\iota)$  is the corresponding price, and  $V^*$  is a constant demand shifter.

Table 3 shows how pricing to market affects our model results. We take the elasticities for the markup,  $\Gamma$  from Lambertini and Proebsting (2019) who estimate these parameters on a sample of euro area countries. They find a markup elasticity of 1.25, implying that producers put a 55% weight on their competitors' prices (as opposed to their own marginal costs). This indicates a fairly strong degree of pricing to market and is at the upper range of values reported by Amiti et al. (2016) for large manufacturers based on micro data for Belgian firms.

In row 7, we explore the role of pricing to market in a model with perfectly integrated factor markets, no separate distribution services, but home bias in government spending. This model captures reasonably well the muted response of the terms of trade: firms in the export sector absorb part of the marginal cost increase through lower markups to stay competitive against foreign producers, whereas import prices would rise a bit as foreign exporters raise their markups in light of less competition. Quantitatively, however, the the terms of trade response is still too strong, and the model fails to account for the large increase of the relative price of non-traded goods and the wage differentials observed across sectors.

In row 6, we add pricing-to-market behavior to our benchmark model. This has only a negligible effect because imperfect factor mobility keeps marginal costs in the traded sector (which is the one that is exposed to foreign competition) unresponsive to spending shocks. Pricing to market only affects prices if marginal costs differ across competitors. In other words, while pricing to market is not a necessary feature, the data does not reject the presence of pricing to market per se.

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Table 1: LIST OF CPA CATEGORIES AND IMPORT SHARES

Code	Name	Weight	Import Share		
			50%	25%	75%
CPA_C26	Computer, electronic and optical products	10%	89.9%	82.7%	94.9%
CPA_C13T15	Textiles, wearing apparel, leather and related products	19%	86.5%	74.0%	94.2%
CPA_C29	Motor vehicles, trailers and semi-trailers	16%	86.0%	70.9%	93.1%
CPA_C20	Chemicals and chemical products	5%	82.7%	62.8%	89.1%
CPA_C21	Basic pharmaceutical products and pharmaceutical preparations	13%	79.8%	71.5%	92.9%
CPA_C27	Electrical equipment	6%	79.1%	64.9%	87.9%
CPA_C28	Machinery and equipment n.e.c.	1%	74.7%	56.3%	88.1%
CPA_C22	Rubber and plastic products	2%	72.4%	56.2%	86.6%
CPA_C24	Basic metals	0%	66.2%	8.4%	71.2%
CPA_C30	Other transport equipment	2%	62.6%	46.8%	81.3%
CPA_C17	Paper and paper products	2%	62.4%	40.4%	79.4%
CPA_C31_32	Furniture and other manufactured goods	9%	57.4%	52.7%	65.1%
CPA_A03	Fish and other fishing products; aquaculture products; support services to fishing	0%	45.4%	29.4%	64.7%
CPA_C25	Fabricated metal products, except machinery and equipment	1%	41.9%	23.7%	60.9%
CPA_C23	Other non-metallic mineral products	2%	41.7%	32.1%	63.0%
CPA_C19	Coke and refined petroleum products	34%	37.3%	29.2%	50.8%
CPA_A01	Products of agriculture, hunting and related services	14%	36.7%	25.0%	50.7%
CPA_C10T12	Food, beverages and tobacco products	98%	32.2%	21.5%	47.7%
CPA_H51	Air transport services	6%	30.3%	10.5%	64.0%
CPA_C16	Wood and products of wood and cork, except furniture; articles of straw and plaiting materials	1%	27.7%	20.8%	49.0%
CPA_B	Mining and quarrying	10%	25.8%	4.9%	73.3%
CPA_J58	Publishing services	11%	18.2%	10.4%	30.2%
CPA_J62_63	Computer programming, consultancy and related services; Information services	0%	8.3%	1.4%	19.9%
CPA_A02	Products of forestry, logging and related services	1%	8.0%	1.5%	24.0%
CPA_J59_60	Motion picture, video and television programme production services, sound recording and music publishing; programming and broadcasting services	4%	7.7%	3.1%	17.4%
CPA_M72	Scientific research and development services	0%	6.1%	2.8%	21.1%
CPA_H50	Water transport services	1%	5.4%	1.0%	37.4%
CPA_K64	Financial services, except insurance and pension funding	25%	4.8%	0.7%	6.8%
CPA_M71	Architectural and engineering services; technical testing and analysis services	0%	4.4%	0.0%	10.0%
CPA_R90T92	Creative, arts, entertainment, library, archive, museum, other cultural services; gambling and betting services	12%	2.9%	0.3%	6.2%
CPA_J61	Telecommunications services	32%	2.8%	0.0%	7.7%
CPA_H53	Postal and courier services	1%	2.6%	0.0%	7.0%
CPA_M69_70	Legal and accounting services; services of head offices; management consultancy services	1%	1.6%	0.0%	9.3%
CPA_D35	Electricity, gas, steam and air conditioning	30%	1.5%	0.0%	6.3%
CPA_K65	Insurance, reinsurance and pension funding services, except compulsory social security	19%	1.5%	0.0%	5.6%
CPA_H49	Land transport services and transport services via pipelines	18%	0.9%	0.3%	5.3%
CPA_C18	Printing and recording services	0%	0.6%	0.0%	1.4%
CPA_H52	Warehousing and support services for transportation	1%	0.5%	0.0%	11.0%
CPA_E37T39	Sewerage services; sewage sludge; waste collection, treatment and disposal services; materials recovery services; remediation services and other waste management services	7%	0.5%	0.0%	11.9%
CPA_N77	Rental and leasing services	6%	0.5%	0.0%	11.1%
CPA_M74_75	Other professional, scientific and technical services and veterinary services	1%	0.3%	0.0%	12.6%
CPA_F	Constructions and construction works	4%	0.3%	0.0%	0.9%
CPA_C33	Repair and installation services of machinery and equipment	3%	0.2%	0.0%	5.7%
CPA_Q86	Human health services	26%	0.1%	0.0%	0.4%
CPA_I	Accommodation and food services	80%	0.0%	0.0%	3.8%
CPA_S96	Other personal services	14%	0.0%	0.0%	4.4%
CPA_R93	Sporting services and amusement and recreation services	8%	0.0%	0.0%	2.7%
CPA_N80T82	Security and investigation services; services to buildings and landscape; office administrative, office support and other business support services	5%	0.0%	0.0%	1.8%
CPA_P85	Education services	16%	0.0%	0.0%	0.2%
CPA_Q87_88	Residential care services; social work services without accommodation	12%	0.0%	0.0%	0.3%
CPA_G45	Wholesale and retail trade and repair services of motor vehicles and motorcycles	30%	0.0%	0.0%	0.2%
CPA_O84	Public administration and defence services; compulsory social security services	3%	0.0%	0.0%	0.2%
CPA_N79	Travel agency, tour operator and other reservation services and related services	9%	0.0%	0.0%	0.7%
CPA_S95	Repair services of computers and personal and household goods	1%	0.0%	0.0%	0.2%
CPA_E36	Natural water; water treatment and supply services	5%	0.0%	0.0%	0.2%
CPA_L68	Real estate services	43%	0.0%	0.0%	0.0%
CPA_G47	Retail trade services, except of motor vehicles and motorcycles	129%	0.0%	0.0%	0.3%
CPA_G46	Wholesale trade services, except of motor vehicles and motorcycles	57%	0.0%	0.0%	0.6%
CPA_K66	Services auxiliary to financial services and insurance services	1%	0.0%	0.0%	0.6%
CPA_M73	Advertising and market research services	0%	0.0%	0.0%	0.0%
CPA_N78	Employment services	0%	0.0%	0.0%	0.3%
CPA_S94	Services furnished by membership organisations	5%	0.0%	0.0%	0.0%
CPA_T	Services of households as employers; undifferentiated goods and services produced by households for own use	3%	0.0%	0.0%	0.0%
CPA_U	Services provided by extraterritorial organisations and bodies	0%	0.0%	0.0%	0.0%

Notes: Table displays the list of CPA categories including their codes and description. We classify goods with an import share above 10% as high-import share goods (those above the horizontal line). Weight is the product's share in the overall HICP basket (averaged across countries) in promils. Summing up across weights gives a value of 879 %because 121 %of consumption falls on VAT.The 25%, 50% and 75% quantiles across countries of the import share are given as well.

Table 2: LIST OF COICOP CATEGORIES AND IMPORT SHARES

Code	Name	Weight	Import Share		
			50%	25%	75%
CP0712_0714	Motor cycles, bicycles and animal drawn vehicles	2%	53.7%	32.7%	64.0%
CP0911	Equipment for the reception, recording and reproduction of sound and picture	5%	50.7%	48.8%	53.2%
CP0711	Motor cars	33%	49.8%	42.5%	55.5%
CP0531_0532	Major household appliances whether electric or not and small electric household appliances	9%	49.6%	43.5%	57.6%
CP0912	Photographic and cinematographic equipment and optical instruments	2%	48.0%	44.8%	50.4%
CP0512	Carpets and other floor coverings	2%	46.1%	36.8%	48.2%
CP0611*	Pharmaceutical products	16%	45.5%	41.2%	52.3%
CP0452*	Gas	12%	44.4%	11.8%	73.3%
CP032	Footwear	11%	41.6%	33.6%	43.7%
CP0733	Passenger transport by air	6%	37.6%	11.7%	67.1%
CP0431	Materials for the maintenance and repair of the dwelling	5%	36.3%	26.4%	44.9%
CP0312	Garments	38%	35.2%	28.2%	36.9%
CP0931	Games, toys and hobbies	5%	35.0%	32.8%	41.1%
CP0453	Liquid fuels	5%	34.7%	27.9%	50.5%
CP0722	Fuels and lubricants for personal transport equipment	47%	32.9%	24.9%	50.2%
CP0313	Other articles of clothing and clothing accessories	2%	31.6%	25.6%	33.0%
CP0511	Furniture and furnishings	17%	30.8%	25.5%	34.2%
CP1212_1213	Electrical appliances for personal care; other appliances, articles and products for personal care	17%	29.0%	20.2%	31.8%
CP1232	Other personal effects	4%	28.7%	23.4%	31.3%
CP0115	Oils and fats	6%	27.8%	16.6%	42.7%
CP1231	Jewellery, clocks and watches	4%	27.4%	25.6%	29.2%
CP052	Household textiles	5%	26.3%	22.3%	28.3%
CP0111	Bread and cereals	30%	26.1%	15.7%	40.4%
CP0612_0613	Other medical products, therapeutic appliances and equipment	4%	25.6%	23.0%	30.9%
CP022	Tobacco	31%	24.4%	19.5%	32.1%
CP0721	Spare parts and accessories for personal transport equipment	6%	23.6%	18.2%	27.0%
CP054	Glassware, tableware and household utensils	5%	23.5%	15.4%	31.3%
CP0561	Non-durable household goods	11%	23.5%	19.4%	29.6%
CP0112	Meat	40%	22.9%	13.9%	35.2%
CP055	Tools and equipment for house and garden	4%	22.7%	18.2%	28.6%
CP0932	Equipment for sport, camping and open-air recreation	2%	22.0%	20.4%	27.2%
CP0122	Mineral waters, soft drinks, fruit and vegetable juices	10%	22.0%	13.3%	33.7%
CP0311	Clothing materials	0%	21.6%	18.2%	22.4%
CP0921_0922	Major durables for indoor and outdoor recreation including musical instruments	2%	21.4%	18.7%	25.0%
CP0116	Fruit	11%	20.4%	15.2%	32.8%
CP0119	Food products n.e.c.	6%	20.3%	13.3%	30.2%
CP0114	Milk, cheese and eggs	27%	20.3%	12.5%	29.9%
CP0913	Information processing equipment	5%	20.0%	15.9%	26.2%
CP0118	Sugar, jam, honey, chocolate and confectionery	11%	19.6%	12.0%	29.7%
CP0212	Wine	8%	18.1%	11.2%	27.5%
CP0117	Vegetables	16%	18.1%	13.5%	28.7%
CP0951	Books	5%	18.1%	9.4%	28.6%
CP0211	Spirits	8%	17.8%	11.0%	26.9%
CP0213	Beer	9%	17.8%	11.1%	27.5%
CP0933	Gardens, plants and flowers	5%	17.6%	12.4%	28.7%
CP0953_0954	Miscellaneous printed matter; stationery and drawing materials	3%	17.2%	11.3%	20.7%
CP082_083	Telephone and telefax equipment and services	33%	16.9%	15.5%	23.2%
CP0952	Newspapers and periodicals	7%	16.6%	8.7%	26.5%
CP0121	Coffee, tea and cocoa	5%	15.8%	10.1%	22.0%
CP0934_0935	Pets and related products; veterinary and other services for pets	5%	14.6%	10.7%	23.2%
CP0923	Maintenance and repair of other major durables for recreation and culture	0%	13.5%	0.1%	26.3%
CP0113	Fish and seafood	8%	11.1%	8.1%	15.3%
CP0914	Recording media	3%	9.6%	5.1%	12.6%
CP0454	Solid fuels	4%	6.2%	2.3%	18.9%
CP0513	Repair of furniture, furnishings and floor coverings	0%	5.9%	0.6%	10.4%
CP0734	Passenger transport by sea and inland waterway	1%	5.6%	1.6%	32.8%
CP126	Financial services n.e.c.	28%	5.0%	0.3%	6.8%
CP0942	Cultural services	25%	4.9%	1.9%	9.3%
CP0941	Recreational and sporting services	12%	4.7%	3.5%	5.4%
CP081*	Postal services	1%	2.7%	0.0%	7.5%
CP0455*	Heat energy	10%	2.4%	0.2%	7.5%
CP127*	Other services n.e.c.	17%	2.3%	1.2%	3.5%
CP125	Insurance	23%	1.8%	0.0%	5.8%
CP0736	Other purchased transport services	0%	1.7%	1.3%	6.9%
CP0724*	Other services in respect of personal transport equipment	7%	1.6%	0.0%	13.8%
CP0915	Repair of audio-visual, photographic and information processing equipment	1%	1.3%	1.2%	1.7%
CP0731*	Passenger transport by railway	4%	1.2%	0.2%	4.5%
CP0451*	Electricity	25%	1.1%	0.0%	6.5%
CP0314	Cleaning, repair and hire of clothing	1%	1.0%	0.2%	3.7%
CP0732*	Passenger transport by road	12%	1.0%	0.2%	3.1%
CP0735*	Combined passenger transport	4%	1.0%	0.3%	3.1%
CP0443*	Sewerage collection	3%	0.9%	0.0%	10.3%
CP0562	Domestic services and household services	6%	0.9%	0.0%	4.1%
CP0442*	Refuse collection	3%	0.7%	0.0%	9.8%
CP0723	Maintenance and repair of personal transport equipment	15%	0.2%	0.0%	0.6%
CP0621_0623	Medical services and paramedical services	11%	0.2%	0.0%	0.9%
CP0533	Repair of household appliances	1%	0.1%	0.0%	1.4%
CP0622*	Dental services	8%	0.1%	0.0%	0.5%
CP063	Hospital services	8%	0.1%	0.0%	0.5%
CP0432	Services for the maintenance and repair of the dwelling	5%	0.0%	0.0%	0.8%
CP0444	Other services relating to the dwelling n.e.c.	4%	0.0%	0.0%	3.1%
CP1211	Hairdressing salons and personal grooming establishments	10%	0.0%	0.0%	2.5%
CP1111	Restaurants, cabs and the like	62%	0.0%	0.0%	3.9%
CP1112	Canteens	9%	0.0%	0.0%	3.9%
CP112	Accommodation services	20%	0.0%	0.0%	3.9%
CP10*	Education	15%	0.0%	0.0%	0.9%
CP0441*	Water supply	6%	0.0%	0.0%	0.1%
CP124*	Social protection	12%	0.0%	0.0%	0.2%
CP041*	Actual rentals for housing	41%	0.0%	0.0%	0.0%
CP096	Package holidays	10%	0.0%	0.0%	0.6%

Notes: Table displays the list of COICOP categories including their codes and description. We classify COICOP categories with an import share above 10% as high-import share COICOP categories (those above the horizontal line). Weight is the average consumption basket weight (across countries and time) in promils. The 25%, 50% and 75% quantiles across countries of the import share are given as well. Categories classified as administered are marked with an asterisk.

Table 3: ALTERNATIVE MODEL SPECIFICATIONS: SPENDING MULTIPLIERS

		Aggregate Multipliers				Relative Multipliers			
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		$P^{ret}$	$ToT$	$NX$	$GDP$	$\frac{P_N^{ret}}{P_T^{ret}}$	$\frac{C_N}{C_T}$	$\frac{GVA_N^{defl}}{GVA_T^{defl}}$	$\frac{W_N}{W_T}$
<b>Data</b>									
(1)		0.37	-0.09	-1.42	1.02	1.09	-1.55	1.03	1.27
		[0.01; 0.72]	[-0.70; 0.52]	[-1.97; -0.87]	[0.55; 1.50]	[0.45; 1.74]	[-2.29; -0.81]	[-0.12; 2.18]	[0.00; 2.54]
<b>Model</b>									
(2)	Plain Vanilla	0.27	0.54	-3.44	0.91	0.14	-0.14	0.04	0.00
(3)	(2) + Home bias in G	0.36	0.77	-3.69	0.99	0.22	-0.22	0.06	0.00
(4)	(3) + Imperfect factor mobility	0.79	0.11	-2.02	1.14	0.76	-0.76	2.00	1.64
(5)	(4) + Distribution services (Benchmark)	0.57	0.08	-1.76	1.04	1.25	-1.25	1.51	1.47
(6)	(5) + Pricing to market	0.61	0.05	-1.83	1.08	1.28	-1.28	1.60	1.47
(7)	(3) + Pricing to market	0.52	0.33	-3.12	1.17	0.32	-0.32	0.68	0.00
(8)	(2) + Imperfect factor mobility	0.53	0.13	-2.26	0.97	0.50	-0.50	1.24	1.04
(9)	(5) with mobile capital	0.53	0.41	-2.86	1.06	0.88	-0.88	1.03	1.58
(10)	(5) with mobile labor	0.42	0.43	-2.55	0.98	0.56	-0.56	0.65	-0.00

Notes: The Table reproduces Table 3 in the main text and adds two rows for the model that features pricing to market.