

Data Appendix

“Understanding European Real Exchange Rates,”

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This appendix provides further description of our data sources and manipulations and tabulates the supplemental data used in our paper.

National retail price data. The retail price data were compiled and published by Eurostat, the statistical agency of the European Community, in cooperation with the national statistical agencies of the countries that participated. While all of the price data we utilize is published we are unaware of available electronic copies. All prices refer to cash prices paid by final consumers, including taxes, both VAT and any others paid by the purchaser. Sales points are selected in such a way that the sample selected is representative of the distribution in the capital city. Prices are collected at different locations so that the average price is representative of the distribution within the city. These data were not available electronically so we had a private firm key-punch the commodity codes, commodity descriptions and prices into an electronic format.

Data Reconciliation. In order to explain the price dispersion across goods that exists in our data we constructed measures of tradeability and the costs of non-traded inputs into production. The constructed variables for tradeability, and non-traded inputs from input-output tables are available at different levels of detail. For this reason, and in order to make the most of the information available for each of these factors, we matched the retail price data with each of the variables using two-digit, three-digit, and four-digit classifications depending on the level of detail available for each of the variables rather than attempting to match all variables using the same level of detail. The input-output data are also available at a three-digit level of detail that extends to four-digits for some industry groups. In order to reconcile the data as accurately as possible, we used the ISIC codes and descriptions available in the User Guide of the OECD International Sectoral Database. A description of each of our variables is as follows.

- *Tradeability.* We obtained data on imports, exports, and gross output for the period 1973 to 1990 from the 1994 edition of the OECD STAN Database. We use thirty-two non-overlapping subdivisions of manufacturing for which sufficient data are available and to the extent that they are relevant to the commodities in our price dataset. We also constructed additional tradeability indices for agriculture (sector 1) and electricity, gas, and water (sector 4) using the 1994 edition of the OECD Sectoral Database, which provides value-added instead of gross output data. Unfortunately, we only have this data for six countries: Belgium, Denmark, France, Germany, Italy, and the

United Kingdom. We assigned a zero trade share to the following industries: restaurants and hotels, transport, storage and communication, inland transport, maritime and air transport, communication, financing, insurance, real estate and business services, community, social and personal services. Otherwise, our measure of tradeability is calculated as:

$$\theta_k = \frac{\sum_{j=1}^{m_k} (X_{kj} + M_{kj})}{\sum_{j=1}^{m_k} Y_{kj}} ,$$

where for each sector k we sum over all countries j which have data for that sector. X_{kj} (M_{kj}) stands for exports (imports) of sector k from country j and Y_{kj} stands for the gross output of sector k by country j .

- *Input-Output Data.* We use the input-output matrix for the United Kingdom in 1988. These data were compiled by Keith Maskus and Allan Webster (1995). We thank Tom Prusa for suggesting this data source, which is available at the National Bureau of Economic Research home page. Non-traded inputs are assumed to include: utilities, construction, distribution, hotels, catering, railways, road transport, sea transport, air transport, transport services, telecommunications, banking, finance, insurance, business services, education, health and other services. We compute the cost share of non-traded intermediate inputs computed as,

$$\Phi_k = \sum_{s=1}^S \phi_{ks} ,$$

where ϕ_{ks} is the share of non-traded intermediate input s in the total cost of the output of sector k .

Nominal exchange rates. We obtained daily data on nominal exchange rates from the New York Federal Reserve Bank's web page. The Eurostat survey provides a 2-3 month window during which the survey was conducted for each good (for each of our 4 cross-sections). Accordingly, the nominal exchange rate we use is an average of the daily values over the respective months for each good. Data and programs are available at <http://bertha.tepper.cmu.edu/eurostat>.

VAT data. We obtained country-specific data on VAT rates for 23 different categories of goods and services for each of the years 1975, 1980, 1985 and 1990. We then categorized each of our goods into one of these categories and then divided each individual price by its associated country/year-specific VAT rate to arrive at before-VAT prices. All of our analysis in Tables 4-6 of our paper, and Figure 3, use these before-VAT prices. The VAT rates across EU countries are taken primarily from the European Commission publication "VAT rates applied

in the member states of the European Community” (2002), the OECD publication ”Taxing Consumption”, and the Ernst and Young publication ”Vat and Sales Taxes Worldwide: A Guide to Practice and Procedures in 61 Countries” (1996). Secondary sources on VAT rates include the Tax Executives Institute publication ”Value-Added Taxes: A Comparative Analysis” (1992), Alan Tait’s ”Value Added Tax: International Practice and Problems” (1988), and George Carlin’s ”Value-Added Tax: European Experience and Lessons for the United States” (1980). The data are available at <http://bertha.tepper.cmu.edu/eurostat>.

Real GDP Per-Capita was obtained from Penn World Tables 6.1 for each of the years corresponding to our cross-sections.

A statistical appendix and more extensive data appendix are available from the authors upon request.

References

Maskus, Keith, and Allan Webster, 1995, Factor specialization in U.S. and U.K. trade: Simple departures from the factor-content theory, *Swiss Journal of Economics and Statistics* 1 (131).

Table A1
Non-Traded Input Cost Shares

Category	Input share	Category	Input Share
Agriculture	0.144	Glass	0.195
Forestry and fishing	0.318	Clay refractories	0.201
Milk and milk products	0.080	Cement, concrete	0.259
Meat, fruit, veg, fish processing	0.096	Iron and steel; plant	0.111
Oils and fats, grain products	0.124	Non-ferrous metals	0.092
Bread, biscuits etc	0.104	Metal castings etc	0.119
Sugar, confectionery	0.139	Office machinery, computers	0.103
Foods, nes	0.174	Other machinery	0.116
Alcoholic drink	0.097	Telecomms equipment	0.120
Soft drink	0.160	Domestic electric appliances	0.135
Tobacco	0.046	Electronic consumer goods	0.113
Woven textiles	0.095	Electronic components	0.147
Hosiery, other knitted goods	0.097	Electric lighting equipment	0.106
Carpets etc	0.112	Shipbuilding and repairing	0.134
Clothing and furs	0.096	Motor Vehicles and parts	0.090
Leather and leather goods	0.073	Other vehicles	0.110
Footwear	0.086	Instrument engineering	0.149
Wood furniture	0.107	Other manufacturing	0.122
Paper and board products	0.135	Utilities	0.157
Printing and publishing	0.211	Hotels, catering etc	0.144
Synthetic resins, man-made fibers	0.134	Railways	0.272
Paints, dyes etc	0.154	Road transport etc	0.151
Soap and toiletries	0.226	Air transport	0.253
Chemicals nes	0.133	Transport services	0.204
Mineral oil processing	0.054	Telecomms and postal	0.124
Rubber and plastic products	0.127	Business services etc	0.134
		Other services	0.304

Values are based on the author's calculations, deriving from the 1988 input-output matrix for the U.K., compiled by Maskus and Webster (1995) and available at <http://www.nber.org>. Further details are available in the data appendix.

Table A2
Trade Shares

Industry	Trade Share			
	1975	1980	1985	1990
Agriculture, hunting, forestry and fishing	0.26	0.41	0.38	0.56
Food	0.27	0.26	0.29	0.31
Beverages	0.20	0.25	0.28	0.33
Tobacco	0.06	0.17	0.21	0.21
Textiles	0.44	0.53	0.64	0.70
Wearing apparel	0.48	0.47	0.58	0.71
Leather products	0.47	0.63	0.77	0.82
Footwear	0.42	0.58	0.73	0.77
Furniture and fixtures	0.17	0.23	0.29	0.32
Paper and paper products	0.40	0.45	0.54	0.61
Printing and publishing	0.15	0.15	0.16	0.15
Industrial chemicals	0.58	0.75	0.90	0.98
Other chemicals	0.29	0.44	0.54	0.57
Chemical products, n.e.c.	0.25	0.46	0.59	0.65
Misc. products of petroleum and coal	0.62	0.46	0.42	0.36
Rubber products	0.40	0.50	0.58	0.62
Plastic products, n.e.c.	0.21	0.27	0.30	0.28
Pottery, china etc.	0.23	0.28	0.26	0.25
Non-metal products, n.e.c.	0.19	0.19	0.21	0.22
Iron and steel	0.37	0.43	0.48	0.52
Non-ferrous metals	0.69	0.66	0.71	0.73
Fabricated metal products, except machinery and equipment	0.28	0.34	0.39	0.40
Office and computing machinery	1.08	1.24	1.35	1.40
Machinery and equipment, n.e.c.	0.56	0.56	0.60	0.62
Electrical machinery	0.38	0.44	0.52	0.61
Radio, television and communication equipment	0.50	0.49	0.62	0.79
Electrical apparatus, n.e.c.	0.39	0.47	0.49	0.54
Shipbuilding and repairing	0.53	0.40	0.42	0.44
Motor vehicles	0.51	0.58	0.66	0.72
Motorcycles and bicycles	0.55	0.50	0.62	1.00
Professional goods	1.00	1.13	1.52	1.49
Other manufacturing n.e.c.	0.94	1.20	1.39	1.47
Electricity, gas and steam and water	0.63	1.16	0.84	0.68

Source: OECD Sectoral Database and OECD STAN Database. The following industries (not shown) have been assigned a zero trade share: restaurants and hotels, transport, storage and communication, inland transport, maritime and air transport, communication, financing, insurance, real estate and business services, community, social and personal services.