



No. 2013-04A

OFFICE OF ECONOMICS WORKING PAPER
U.S. INTERNATIONAL TRADE COMMISSION

Government Consumption and Global Value Chains

David Riker*
U.S. International Trade Commission

April 2013

*The author is with the Office of Economics of the U.S. International Trade Commission. Office of Economics working papers are the result of the ongoing professional research of USITC Staff and are solely meant to represent the opinions and professional research of individual authors. These papers are not meant to represent in any way the views of the U.S. International Trade Commission or any of its individual Commissioners. Working papers are circulated to promote the active exchange of ideas between USITC Staff and recognized experts outside the USITC, and to promote professional development of Office staff by encouraging outside professional critique of staff research.

Address correspondence to:
Office of Economics
U.S. International Trade Commission
Washington, DC 20436 USA

Government Consumption and Global Value Chains

David Riker¹

United States International Trade Commission

4/9/13

Abstract

Imports account for only a small share of government consumption, and this suggests that foreign producers have limited direct participation in markets for public procurement. However, global value chains can provide foreign producers with indirect access to these markets, as they export to downstream producers who then directly serve the markets. This is reflected in much higher import shares in government consumption when the imports are measured as international flows of value added. In this paper, we use the World Input-Output Database (WIOD) and a model of trade in value added to improve estimates of home bias in government consumption. We find that the home bias in government consumption is much larger than the home bias in private consumption, as we would expect, though the home bias in government consumption is smaller when it is calculated from value-added shares. The home bias in government consumption limits the international transmission of changes in fiscal policy. Although there were large changes in the level and composition of government consumption between 2008 and 2009 in many of the WIOD countries, most of the impact of these changes was on domestic shipments of value added. There were only modest aggregate changes in international trade. There were, however, significant bilateral effects for certain country pairs.

Keywords

Global value chains, home bias, public procurement

¹The author with the Office of Economics of the U.S. International Trade Commission. This paper is the result of the ongoing professional research of USITC Staff and is solely meant to represent the opinions and professional research of the individual author. The paper is not meant to represent in any way the views of the U.S. International Trade Commission or any of its individual Commissioners. The author is grateful to Justino De La Cruz, Michael Ferrantino, and William Powers for helpful comments.

I. Introduction

Government consumption has grown as a share of the world economy in recent years.² Figure 1 reports the global share of government consumption in the final use of goods and services between 1999 and 2009, according to the World Input-Output Database (WIOD). The share of government consumption rose between 1999 and 2003, and then it started to decline. It turned up significantly in 2009 as many countries adopted expansionary fiscal policies to try to mitigate the global economic downturn. Table 1 reports that the share of government consumption in final use increased in thirty-five of the forty WIOD countries over the decade.

In principle, an expansion in a country's government consumption can significantly increase the demand for imports from its trading partners, just as a contraction in its government consumption can significantly reduce this demand. However, the international transmission of changes in government consumption is fairly limited, because foreign producers supply a relatively small share of government consumption.

The small share of imports in government consumption is often described as a home bias in public procurement. *Home bias* is a technical term in international economics that means that the expenditure shares of domestic products are greater than predicted in a theoretical benchmark with identical homothetic preferences in each country and frictionless international trade. Obstfeld and Rogoff (2001) identify home bias in international trade as the first of their six major puzzles in international macroeconomics. The authors make the point that home bias can arise from trade costs, a bias in preferences, or a combination of the two. Barriers to international trade are likely to be high because government consumption often involves services that are difficult to import, like public administration and national defense. Trefler (1995) shows that home bias helps to resolve the "case of the missing trade" implied by Heckscher-Ohlin-Vanek models of international trade. Likewise, Trefler and Zhu (2010) provide evidence of home bias in the consumption of government services. Yi (2010) examines home bias in the context of a model with multi-stage production and international trade.

² Government consumption is a subcategory of government expenditures. According to United Nations (2003), the subcategory includes goods and services that are produced by the government sector and distributed free to individuals, such as education, health, social security and welfare, sports and recreation, culture, providing of housing, collection of refuse, and operation of transport. Government consumption does not include capital expenditures by the government.

The term is specifically applied to government procurement in Trionfetti (2000).³ The author calculates import shares for government consumption and private consumption for seven countries in the European Union in 1985. He interprets the relatively low import shares in government consumption, ranging from six percent for Spain to twenty percent for the United Kingdom, as evidence of home bias in public procurement. More recently, European Commission (2011) estimates that imports comprised 7.5 percent of E.U. public sector expenditures and 19.1 percent of E.U. private sector expenditures in 2005, and 4.6 percent of U.S. public sector expenditures and 7.5 percent of U.S. private sector expenditures in the same year.

The term home bias is not a value judgment, as the common use of bias might imply, nor does it necessarily imply preferential treatment in violation of a country's international obligations under the WTO's Agreement on Government Procurement (GPA).⁴

The data analyzed in this paper confirm that the direct import shares of government consumption are much smaller than the comparable shares of private consumption, and they have not increased significantly over the last decade. However, despite limited direct participation in markets for government consumption, foreign producers have indirectly supplied these markets. The goods and services in government consumption typically contain some foreign value added even when they are not direct imports for foreign producers. For example, if a Chinese producer exports an intermediate good or service to a U.S. producer, who uses the intermediate to produce a final good or service for U.S. government consumption, then there are indirect U.S. imports of value added from China through a global value chain but no direct U.S. imports for government consumption. To our knowledge, this issue has not been addressed in the empirical literature on home bias in government procurement.

We update the prior studies of home bias and extend the analysis by incorporating indirect imports of value added. We use international input-output tables and a methodology for calculating trade in value added to provide improved measures of import penetration in the

³ Fujiwara and Long (2012) analyze the welfare implications of home bias in government procurement within a purely theoretical framework.

⁴ Shingal (2011) discusses the practical limitations of the GPA. Chen and Whalley (2011) use an econometric model to estimate the effects of GPA membership on international trade in goods and services and cross-border affiliate sales. They find a positive and statistically significant impact of GPA membership for the period from 1996 to 2008.

markets for government consumption.⁵ We find that the foreign shares of the value added in government consumption are much larger than the direct import shares, especially for exports from developing countries. Then we use the model to calculate the changes in trade in value added that resulted from the large changes in government consumption between 2008 and 2009.

The rest of the paper is organized into five sections. Section II outlines the methodology for calculating trade in value added using international input-output tables. Section III measures home bias in government consumption using import shares calculated from direct imports and, alternatively, from imports of value added. Section IV calculates the changes in trade that resulted from the large changes in government consumption between 2008 and 2009. Section V provides concluding remarks.

II. Trade in Value Added and Global Value Chains

The term *global value chain* refers to the geographic fragmentation of production across national borders. Different stages in the production process are located in different countries. It is unusual for a single country to contribute all of the value added that is embodied in the final goods and services that it exports. Direct imports from country i to country j are traditionally measured using the gross value of trade between the two countries. In contrast, imports of value added from country i to country j are measured as the part of the total imports of final goods and services into country j that is a contribution of value added from country i (even if the final goods and services are not directly imported from country i) as well as the part of the domestic shipments in country j that is a contribution of value added from country i .

Calculating the trade in value added that is finally used in government consumption involves a two-step process. The first step is to allocate a country's government consumption in each year across supply sectors and countries. WIOD provides estimates of the dollar value of government consumption by sector, country, and year.⁶ The second step is to calculate each country's contribution of value added to the global supply chain for government consumption.

⁵ Johnson and Noguera (2012) and Koopman, Wang, and Wei (forthcoming) provide a mathematical framework for calculating each country's trade in value added.

⁶ Timmer et al. (2012) provides a detailed description of how this database was constructed.

Trefler and Zhu (2010), Johnson and Noguera (2012), Stehrer (2012), Koopman, Wang, and Wei (forthcoming), and others, have developed methodologies for calculating trade in value added.

The starting point for these calculations is an international input-output (IIO) table for each year. An IIO table reports how the output of each sector in each country is allocated across many alternative uses, including use as an intermediate input in each sector in the same country, as exports to other countries, and as final goods or services in private consumption, government consumption, and capital formation in each country. WIOD provides estimates of the intermediate use columns of the table, which are represented by the NC by NC matrix A . N represents the number of sectors, and C represents the number of countries. The NC by C matrix X represents the value of output in each sector and country in a year. Given these definitions, the value of output in each sector and country is the sum of its intermediate uses, AX , and its final uses.

$$X = AX + H + G + K + Z \quad (1)$$

The NC by C matrices H , G , K , and Z represent the final consumption expenditures by households, final consumption expenditure by government, gross fixed capital formation, and other final uses in each country, for the output of each sector and country.⁷

Equation (2) is the solution for X . It is the direct and indirect final use of the output of each sector and country of origin in each destination country.

$$X = (I - A)^{-1}(H + G + K + Z) \quad (2)$$

The matrix I is an NC by NC identity matrix. $(I - A)^{-1}$ is commonly called Leontief's Inverse.

The matrix X is converted into a measure of the value added in each country of origin in the final use category of the destination country by multiply by a C by NC matrix V that contains the shares of direct value added in the output of the sectors in each country. Equation (3) focuses specifically on government consumption in destination country d .

$$M_d = V (I - A)^{-1}G_d \quad (3)$$

⁷ The other final uses in WIOD are final consumption expenditures by non-profit organization serving households and changes in inventories and valuables.

The C by 1 vector M_d is the direct and indirect value added of each country in the government consumption of country d , and the NC by 1 vector G_d is the government consumption of country d . The vector M_d includes domestic shipments of value added of government consumption in country d as well as imports of value added from other countries.

III. Home Bias in Government Consumption

Table 2 reports the import shares in each country's government consumption in 2009, for imports from high income countries and developing countries.⁸ Most of the forty WIOD countries are members of the European Union. Eleven of the forty are developing countries.⁹ The first two columns in Table 2 are the shares of direct imports for these two sets of countries. We define direct imports as government consumption that is directly sourced from foreign countries plus any intermediate consumption in WIOD's Public Administration, Defense, and Compulsory Social Security sector that is directly sourced from foreign countries. The rows in Table 2 indicate the destination country. The share of direct imports from high income countries is greater than the share of direct imports from developing countries for most of the rows in this table. The combined direct import shares for both categories of countries, developing and high income, range from 2.2 percent for Japan to 27.3 percent for Cyprus. Cyprus, Hungary, Slovakia, Greece, and Luxembourg are the countries with the highest combined direct import shares in government consumption. They are all relatively small countries that are integrated into the European Union. Japan, Russia, and India are the countries with the lowest combined direct shares.

The third and fourth columns in Table 2 are the foreign shares of the value added in each country's government consumption in 2009. The averages of the columns are reported at the bottom of the table. While the average direct import share is higher for the high income countries than for the developing countries, the opposite is true for the average value-added import share. In addition, the ratio of the average value-added import share for the developing

⁸ A high income country is one that is classified as high income by the World Bank. A developing country is one that is classified as low income or middle income by the World Bank.

⁹ The share of imports from developing countries in Table 2 includes the WIOD aggregate of the rest of the world, even though this aggregate is a mix of high income and developing countries, since developing countries accounted for more than three-fourths of the rest of world in 2009.

countries (the third column) to the average direct import share for these countries (the first column) is 3.1, while the ratio of the average value-added import share for the high income countries (the fourth column) to the average direct import share for the high income countries (the second column) is only 0.6. The difference between these ratios indicates that global value chains were a much more important path to the market for producers in developing countries.

In general, the direct import shares overstate the contribution of high income countries and understate the contribution of developing countries. This probably reflects the fact that the developing countries tend to produce goods and services that are farther upstream. When we sum the direct and value-added import shares across the two categories of countries, developing and high income, we see that the direct import share understate the total contribution of foreign production to government consumption. The average total value-added import share is higher (12.6 percent) than the average total direct import share (10.0 percent).

Table 3 reports the same set of import shares a decade earlier, in 1999. The ratios of the average shares are more extreme: the ratio of the average value-added import share for the developing countries to the average direct import share for the same countries (4.3) is much higher than the same ratio for the high income countries (0.3). This indicates that global value chains were an even more important path a decade earlier. Table 4 provides a final benchmark for the 2009 import shares in Table 2. It reports the import shares in the same column categories for *private* consumption in 2009. The import shares of private consumption are much higher than the import shares of government consumption in 2009 in all four columns. Also, there is less of a distinction between the direct import shares and the value-added import shares in private consumption.

In sum, the comparison of import shares in this section indicates a significant home bias in government consumption, though the bias is less severe in the value-added shares of imports from developing countries than in their direct import shares. The opposite is the case for imports from high income countries. By either measure, the home bias in government consumption is greater than the comparable bias in private consumption.

IV. Changes in Government Consumption and Trade between 2008 and 2009

Table 5 reports the changes between 2008 and 2009 in the annual dollar value of government consumption in the WIOD database. There was a reduction in government consumption in twenty-five of the forty countries. The year-to-year changes in government consumption ranged from a reduction of \$72.5 billion in Great Britain to an increase of \$82.7 billion in Japan. For the sake of comparison, the table also includes the changes in total government expenditures reported by the International Monetary Fund in its *World Economic Outlook* database, also in dollars. The two measures moved in the same direction for thirty-four of the countries. When expressed as percentage changes, the magnitudes are similar for many of the WIOD countries.¹⁰ Our calculations in the next tables focus on the changes in the government consumption measure from WIOD, since these data are tied directly to the sectors in the international input-output tables.

Table 6 reports the changes in each country's exports, imports, and domestic shipments of value added that result from the changes in government consumption in Table 5. The first column is the change in the value added in each country that is consumed by its own government. The countries with the largest increases in domestic value added that is used in their own government consumption were Japan, China, and the United States. The countries with the largest reductions in domestic value added were Great Britain, Russia, and Poland. The second column is the changes in the value added by foreign producers that is consumed by a country's public sector. There was a reduction in these imports of value added for thirty-five of the destination countries between 2008 and 2009. The exceptions were Australia, Canada, India, Indonesia, and Luxembourg. The largest reductions were in the United States, followed by Japan, China, France, and Great Britain. The countries with the largest increases in government consumption reduced not only the share of foreign value added that was used in government consumption but also the total dollar value of these imports of value added. Since the value-added shares are not fixed in the calculations (they vary each year in WIOD), a country's imports from foreign producers do not necessarily increase as the country increases its total government consumption. In many cases, the increase in total government consumption was offset by a shift away from foreign sources of value added.

¹⁰ The IMF's government expenditure measure is broader measure than the government consumption measure in WIOD.

The third column in Table 6 is domestic value added that is exported for use in other country's government consumption. Almost every country in Table 6 experienced a reduction in its exports of value added for foreign government consumption between 2008 and 2009. The lone exception is Indonesia. Germany and Russia experienced the largest reductions in these exports. In terms of percentage changes, the average decline for developing countries (11.0 percent) was slightly larger than the average decline for high income countries (9.6 percent).

Table 7 reports the changes in imports of value added used in government consumption on a bilateral basis for four countries. The table includes the three countries with the largest *reductions* in total imports of value added (the United States, Japan, and China), and it includes the country with the largest *increase* in total imports of value added (Canada). The columns of the table identify the destination country and the rows identify the source country of the value added. For government consumption in the United States, imports of value added declined from every source country, while domestic value added increased substantially between 2008 and 2009. The largest reductions were in imports of value added from the NAFTA countries, Canada and Mexico, followed by Germany and Russia. For government consumption in China, there was an increase in imports of value added from several countries. The largest increases were in imports from Australia, Indonesia, and Taiwan. The largest reductions were in imports from Germany and Russia. For government consumption from Japan, there was a reduction in imports of value added from all countries except Ireland. The largest reductions were in imports from Australia and China, followed by the United States, Germany, and Canada. Finally, for government consumption in Canada, the country with the largest *increase* in total imports of value added used in government consumption, imports of value added increased from twenty of the other countries. The largest increase was in imports from the United States, followed by imports from Australia. The largest reduction was in imports from China.

Table 8 reports the changes in imports of value added for use in government consumption from the perspective of the exporting country, again on a bilateral basis. The table focuses on the three countries with the largest reductions in total exports of value added (the United States, Russia, and Germany) and for the country with the largest increase in total exports of value added (Indonesia). Table 8 is transposed relative to table 7. It reports the change in the value added for use in government consumption from each destination country (indicated by the rows)

for each exporting country (indicated by the columns). Canada, the Netherlands, and Great Britain were the countries with the largest increases in value added exported from the United States, while China, Japan, and Russia were the countries with the largest reductions. Overall, exports of value added from the United States increased to seventeen of the other countries. In contrast, Italy and Taiwan were the only countries that experienced an increase in exports of value added from Russia. Germany and the United States were the countries with the largest reductions in exports of value added from Russia. Malta, Cyprus, and Luxembourg were the only countries with increased exports of value added from Germany, and the increases were small, while the United States, Great Britain, and the Netherlands were the countries with the largest reductions. Indonesia actually experienced an overall increase in its total exports of value added for use in government consumption. Its value-added exports increased to twenty-one of the other countries. Australia and China were the destination countries with the largest increases in exports of value added from Indonesia, while Japan and the United States were the destination countries with the largest reductions.

Bilateral imports of value added for government consumption changed in the same direction as the total government consumption of the destination country for approximately two-thirds of the country pairs. For 52.6 percent of the pairs, both total government consumption and bilateral imports declined between 2008 and 2009. For 12.3 percent of the pairs, they both increased. For the remaining country pairs, the signs of the changes were not the same.

In terms of the absolute magnitudes of these bilateral effects on trade, there are a few general patterns in the data. The absolute magnitudes of the effects tend to be larger if the economies of the two countries are large, if the countries are close together, and if they have a free trade agreement. Nevertheless, the absolute magnitudes of the changes, like the signs of the changes, are not simple to summarize. The pattern of bilateral effects reflects all of the data provided in the IIO tables.

V. Conclusions

The WIOD provides insights into the international repercussions of changes in a country's government consumption. The data indicate that foreign producers have had only limited direct involvement in the markets for government consumption, but they have still made

significant indirect contributions of value added to these markets through trade in intermediate goods and services. Global value chains have been an indirect path through which foreign producers have accessed these markets. Global value chains have been especially important for producers in developing countries.

We find that the home bias in government consumption is much larger than the home bias in private consumption, as we would expect, though the home bias in government consumption is smaller when it is calculated from value-added shares. The home bias in government consumption limits the international transmission of changes in fiscal policy. Although there were large changes in the level and composition of government consumption between 2008 and 2009 in many of the WIOD countries, most of the impact of these changes was on domestic shipments of value added. There were only modest aggregate changes in international trade. There were, however, significant bilateral effects for certain country pairs.

We conclude with a caveat. The model in this paper is not intended as a tool for ex-ante or counterfactual analysis, and it should not be used in that way. It would be inappropriate to assume that the international input-output shares in WIOD would remain fixed if the level of government consumption were altered, since we observe that these shares have changed from one year to the next in the data, and the share changes varied across the countries and across the sectors. Instead, the model provides an ex-post accounting that makes use of these share changes. The ex-post accounting documents the indirect path from foreign producers to government consumption. Because our model is not a tool for ex-ante analysis, it is a very different from the large econometric literature on the international transmission of fiscal policy that builds on Blanchard and Perotti (2002).¹¹ That literature estimates time series models of the transmission of fiscal shocks on macroeconomic variables, and these models can be used to predict the impact of current and future policy changes, with their own set of caveats.

¹¹Beetsman and Guiliodori (2011) and Monacelli and Perotti (2011) are recent examples of this literature.

REFERENCES

- Beetsma, Roel and Massimo Giuliodori, 2011. "The Effects of Government Purchases Shocks: Review and Estimates for the EU." *Economic Journal* 121 (February): F4-F32.
- Blanchard, Olivier and Roberto Perotti, 2002. "An Empirical Characterization of the Dynamic Effects of Changes in Government Spending and Taxes on Output." *Quarterly Journal of Economic* 117(4): 1329-1368.
- Chen, Hejing and John Whalley, 2011. "The WTO Government Procurement Agreement and Its Impact on Trade." National Bureau of Economic Research Working Paper No. 17365.
- European Commission, Internal Market and Services Directorate General, 2011. "Final Report: Cross-Border Procurement Above EU Thresholds."
- Fujiwara, Kenji and Ngo Van Long, 2012. "Welfare Effects of Reducing Home Bias in Government Procurement: A Dynamic Contest Model." *Review of Development Economics* 16(1): 137-147.
- Johnson, Robert C. and Noguera, Guillermo, 2012. "Accounting for intermediates: Production Sharing and Trade in Value Added," *Journal of International Economics* 86(2): 224–236.
- Koopman, Robert, Zhi Wang, and Shang-Jin Wei, forthcoming. "Tracing Value-Added and Double Counting in Gross Exports." Forthcoming in the *American Economic Review*.
- Monacelli, Tommaso and Roberto Perotti, 2010. "Fiscal Policy, the Real Exchange Rate and Traded Goods." *Economic Journal* 120 (May), 437-461.
- Obstfeld, Maurice and Kenneth Rogoff, 2001. "Six Major Puzzles in International Macroeconomics: Is There a Common Cause?" in *National Bureau of Economic Research Macroeconomics Annual 2000*. Ben Bernanke and Kenneth Rogoff, eds. Cambridge, Massachusetts: MIT Press.
- Powers, William, 2012. "The Value of Value Added: Measuring Global Engagement with Gross and Value-Added Trade." *World Economics* 13(4): 19–38.
- Shingal, Anirudh, 2011. "Services Procurement under the WTO's Agreement on Government Procurement: Whither Market Access?" *World Trade Review* 10(4): 527-549.
- Stehrer, Robert, 2012. "Trade in Value Added and the Value Added in Trade." WIOD Working Paper 8.
- Timmer, Marcel, ed., 2012. "World Input-Output Database (WIOD): Contents, Sources, and Methods." WIOD Working Paper 10. World Input-Output Database, April.
- Trefler, Daniel, 1995. "The Case of the Missing Trade and Other Mysteries." *American Economic Review* 85(5): 1029-1046.
- Trefler, Daniel and Susan Chun Zhu, 2010. "The Structure of Factor Content Predictions." *Journal of International Economics* 82: 195-207.
- Trionfetti, Frederico, 2000. "Discriminatory Public Procurement and International Trade." *World Economy* 23(1): 57-76.

United Nations, 2003. "National Accounts, a Practical Introduction." *Handbook of National Accounting*, Series F, No. 85.

Yi, Kei-Mu, 2010. "Can Multistage Production Explain the Home Bias in Trade." *American Economic Review* 100 (1): 364-393.

Figure 1: Government Share of Final Expenditures, Worldwide

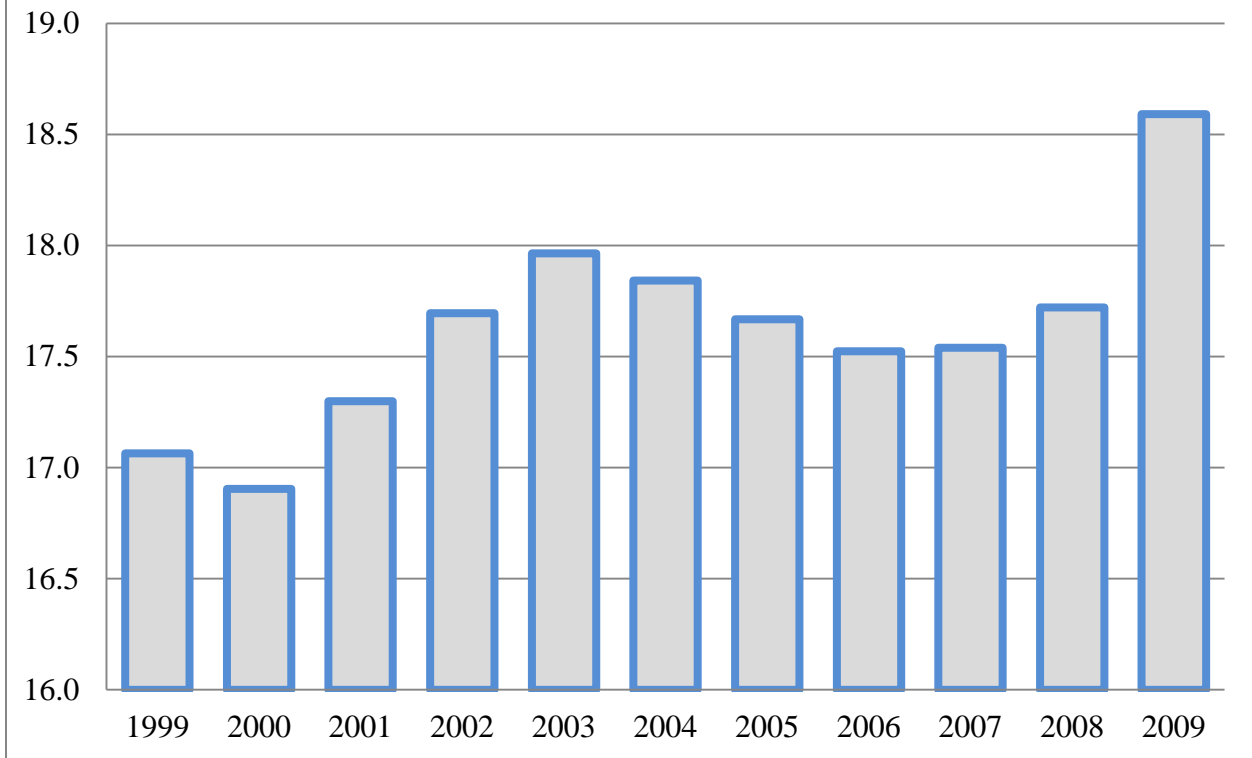


Table 1: Government Consumption by Country

Country of Expenditure	Share of Government Consumption in Final Use Expenditures in 1999 (in %)	Share of Government Consumption in Final Use Expenditures in 2009 (in %)
Australia	17.97	18.95
Austria	20.96	22.54
Belgium	24.24	27.21
Brazil	21.26	22.19
Bulgaria	18.43	16.05
Canada	20.64	22.58
China	15.42	13.62
Cyprus	15.18	18.20
Czech Rep.	21.59	24.21
Denmark	29.99	34.06
Estonia	21.51	25.60
France	25.06	25.48
Finland	25.26	27.46
Germany	20.97	22.46
Great Britain	19.45	24.50
Greece	14.30	19.67
Hungary	21.27	24.83
India	12.85	11.13
Indonesia	6.30	9.89
Ireland	17.35	25.15
Italy	19.47	22.36
Japan	16.91	19.75
Korea	13.53	17.64
Latvia	22.40	20.08
Lithuania	22.48	22.83
Luxembourg	19.69	25.19
Malta	16.26	21.17
Mexico	10.43	12.08
Netherlands	24.96	32.70
Poland	17.59	19.56
Portugal	16.93	21.01
Romania	17.22	17.86
Russia	18.50	23.01
Slovakia	19.96	20.80
Slovenia	18.43	21.51
Spain	17.11	20.90
Sweden	30.94	31.93
Taiwan	14.92	14.58
Turkey	12.10	14.64
United States	13.99	16.64

Source: World Input-Output Database

Table 2: Share of Imports in Government Consumption in 2009

Country of Expenditure	Direct Imports from Developing Countries	Direct Imports from High Income Countries	Value-Added Imports from Developing Countries	Value-Added Imports from High Income Countries
Australia	2.72	2.75	4.79	4.61
Austria	2.36	8.83	10.15	3.75
Belgium	2.34	9.11	10.96	3.73
Brazil	1.56	2.85	2.66	1.76
Bulgaria	3.17	6.22	10.14	8.15
Canada	1.45	6.09	6.81	2.18
China	1.37	4.13	8.37	4.54
Cyprus	4.59	22.68	11.97	3.56
Czech Rep.	1.85	7.46	13.84	4.89
Denmark	1.80	6.17	8.65	3.24
Estonia	4.19	7.32	9.36	5.86
Finland	3.05	6.69	9.76	5.27
France	1.51	5.40	5.2	2.25
Germany	3.60	7.82	7.27	3.79
Great Britain	2.43	5.97	9.4	4.79
Greece	3.06	12.46	7.56	2.93
Hungary	3.65	16.59	16.13	5.85
India	2.04	0.90	2.54	4.06
Indonesia	4.44	4.40	5.52	5.65
Ireland	2.19	10.26	16.45	4.05
Italy	1.40	3.77	4.73	3.07
Japan	1.09	1.08	1.64	2.53
Korea	4.50	7.58	6.86	6.48
Latvia	3.87	10.05	10.12	5.10
Lithuania	4.07	6.18	6.03	7.08
Luxembourg	2.50	12.49	15.71	3.96
Malta	3.71	8.61	13.07	6.36
Mexico	0.95	4.05	3.84	1.18
Netherlands	3.09	6.89	10.04	5.03
Poland	3.13	11.09	9.27	3.78
Portugal	1.56	8.02	7.17	3.14
Romania	2.03	5.54	10.88	5.39
Russia	1.04	1.19	2.52	1.94
Slovakia	4.88	12.68	14.58	6.67
Slovenia	3.38	8.21	10.72	5.19
Spain	1.84	5.91	7.11	3.48
Sweden	2.24	5.13	9.49	4.27
Taiwan	2.48	10.38	5.11	2.94
Turkey	2.05	5.90	5.69	4.52
United States	3.83	3.71	2.58	3.18
Average	2.68	7.31	8.37	4.26

Source: Calculations based on the World Input-Output Database.

Table 3: Share of Imports in Government Consumption in 1999

Country of Expenditure	Direct Imports from Developing Countries	Direct Imports from High Income Countries	Value-Added Imports from Developing Countries	Value-Added Imports from High Income Countries
Australia	1.90	4.08	6.82	3.32
Austria	2.14	9.34	9.69	2.65
Belgium	1.17	9.80	10.57	1.87
Brazil	0.57	3.26	3.03	0.94
Bulgaria	5.10	16.77	14.74	7.39
Canada	0.74	6.57	7.55	1.23
China	0.46	1.85	6.68	2.29
Cyprus	9.00	29.62	13.87	4.17
Czech Rep.	1.43	9.25	15.83	3.42
Denmark	0.72	4.42	6.42	1.35
Estonia	4.10	10.18	13.77	6.28
Finland	0.89	6.50	9.21	2.37
France	0.62	5.03	5.35	1.19
Germany	2.10	5.29	5.90	2.21
Great Britain	1.31	7.75	8.26	1.79
Greece	2.86	27.25	10.93	1.93
Hungary	3.02	12.15	14.33	4.40
India	1.24	2.00	4.11	3.46
Indonesia	4.04	14.84	10.80	3.41
Ireland	0.74	12.51	16.34	1.65
Italy	0.78	3.60	4.63	1.54
Japan	0.52	0.98	1.54	1.23
Korea	2.17	8.74	6.22	3.01
Latvia	4.73	9.47	10.45	5.40
Lithuania	4.83	8.81	7.52	5.93
Luxembourg	1.53	17.58	16.96	1.70
Malta	3.44	12.29	13.09	3.29
Mexico	0.46	4.62	4.94	0.61
Netherlands	2.53	7.85	10.42	3.85
Poland	0.76	5.08	6.43	1.53
Portugal	1.58	7.02	7.31	2.08
Romania	1.03	6.21	14.23	3.68
Russia	1.59	3.99	6.99	3.12
Slovakia	1.61	9.56	14.49	4.07
Slovenia	1.79	9.02	12.15	3.09
Spain	1.24	5.80	7.00	1.99
Sweden	1.22	6.24	9.93	2.32
Taiwan	4.94	17.10	7.82	2.60
Turkey	0.91	5.63	4.32	2.43
United States	1.74	4.32	2.72	1.43
Average	2.09	8.81	9.08	2.81

Source: Calculations based on the World Input-Output Database.

Table 4: Share of Imports in Private Consumption in 2009

Country of Expenditure	Direct Imports from Developing Countries	Direct Imports from High Income Countries	Value-Added Imports from Developing Countries	Value-Added Imports from High Income Countries
Australia	6.22	4.29	8.07	9.76
Austria	4.10	15.40	23.05	8.71
Belgium	6.09	20.02	28.41	11.02
Brazil	1.86	1.24	4.86	4.74
Bulgaria	6.23	13.08	21.02	16.19
Canada	5.72	10.10	16.87	8.27
China	1.91	3.93	10.58	6.16
Cyprus	3.45	14.02	22.02	7.82
Czech Rep.	4.82	16.57	27.61	10.11
Denmark	4.77	15.44	21.77	8.79
Estonia	10.40	15.99	23.44	16.83
Finland	3.74	10.97	17.99	9.55
France	3.82	7.84	13.31	7.70
Germany	5.54	9.90	15.06	9.24
Great Britain	4.79	10.43	16.09	9.01
Greece	2.77	8.67	13.93	8.56
Hungary	3.27	18.53	30.78	10.69
India	1.88	0.99	3.82	6.90
Indonesia	3.09	1.84	6.79	8.51
Ireland	5.89	20.76	38.17	11.72
Italy	2.93	6.57	11.68	8.94
Japan	3.33	1.80	3.86	6.44
Korea	5.14	3.56	10.55	14.63
Latvia	7.12	12.07	18.95	13.69
Lithuania	8.84	15.98	22.39	18.74
Luxembourg	1.43	34.42	43.40	8.42
Malta	6.33	30.44	38.40	14.19
Mexico	2.32	5.82	11.94	4.59
Netherlands	6.40	15.64	23.95	12.87
Poland	3.95	9.25	18.02	9.10
Portugal	1.90	14.42	20.94	7.52
Romania	2.83	9.58	18.56	9.26
Russia	10.08	7.36	11.08	11.49
Slovakia	8.43	17.49	26.87	14.45
Slovenia	7.84	17.92	24.63	13.30
Spain	3.88	6.85	12.52	8.39
Sweden	4.35	14.12	21.86	9.41
Taiwan	4.95	7.26	14.00	11.62
Turkey	2.15	2.89	7.23	8.29
United States	3.03	1.82	4.08	5.59
Average	4.69	11.38	18.21	10.03

Source: Calculations based on the World Input-Output Database.

Table 5: Change in Government Consumption (GC) and Expenditures (GEX)

2008-2009

Country of Expenditure	Change in GC (million US\$)	% Change in GC	Change in GEX (million US\$)	% Change in GEX
Australia	4,958.3	2.76	9,026.2	2.48
Austria	-1,486.1	-1.84	-2,839.1	-1.38
Belgium	-967.0	-0.82	983.3	0.39
Brazil	9,312.0	2.89	-446.1	-0.07
Bulgaria	-707.5	-8.76	-737.0	-4.02
Canada	-3,425.0	-1.16	-6,976.5	-1.17
China	55,315.0	9.82	238,493.8	25.87
Cyprus	146.6	3.23	218.7	2.06
Czech Rep.	-2,278.8	-5.15	-4,653.6	-5.02
Denmark	1,326.5	1.46	2,302.0	1.30
Estonia	-285.9	-6.29	-638.9	-6.52
Finland	-827.5	-1.37	61.8	0.05
France	-10,739.8	-1.62	-24,796.5	-1.64
Germany	-2,954.6	-0.45	-12,700.6	-0.79
Great Britain	-72,500.6	-12.28	-115,905.3	-10.11
Greece	4,443.0	6.89	164.2	0.09
Hungary	-5,008.6	-14.97	-10,827.8	-14.27
India	18,657.0	13.71	6,580.5	1.81
Indonesia	12,072.2	28.96	-10,258.3	-9.45
Ireland	-3,856.2	-8.09	-5,402.7	-4.82
Italy	-10,698.2	-2.31	-28,628.5	-2.54
Japan	82,729.7	9.42	280,536.3	16.19
Korea	-9,810.1	-6.80	-16,429.6	-7.88
Latvia	-1,713.3	-25.47	-3,040.0	-21.06
Lithuania	-1,049.0	-11.56	-1,436.8	-8.10
Luxembourg	226.2	2.60	854.1	3.96
Malta	-73.6	-4.09	-261.8	-6.93
Mexico	-12,919.0	-11.00	-43,087.2	-15.68
Netherlands	2,935.3	1.31	1,340.6	0.33
Poland	-19,099.5	-19.39	-36,744.4	-16.07
Portugal	72.2	0.14	3,371.8	2.97
Romania	-4,976.7	-14.41	-12,372.0	-16.37
Russia	-40,855.1	-14.29	-64,029.0	-11.24
Slovakia	861.2	5.19	3,279.1	9.88
Slovenia	71.8	0.73	71.4	0.31
Spain	-1,312.3	-0.42	11,135.9	1.68
Sweden	-15,387.6	-12.09	-27,002.2	-11.18
Taiwan	-1,579.5	-3.19	2,721.6	3.05
Turkey	-3,990.4	-4.31	-14,950.2	-6.01
United States	28,718.0	1.21	575,336.0	10.27

Source: World Input-Output Database and World Economic Outlook.

Table 6: Change in Value Added Trade Used in Government Consumption

In Millions of US Dollars, 2008-2009

	Domestic VA for Domestic GC	Imported VA for Domestic GC	Exported VA for Foreign GC
Australia	4,696.6	293.4	-587.1
Austria	-59.7	-1,384.1	-1,397.4
Belgium	1206.6	-2,134.4	-1,179.2
Brazil	10,959.5	-1,633.9	-1,921.3
Bulgaria	-201.7	-489.3	-92.8
Canada	-3,983.5	560.8	-6,449.0
China	65,243.3	-9,897.0	-4,200.0
Cyprus	219.8	-70.0	-24.0
Czech Rep.	-2,012.5	-208.4	-469.0
Denmark	2,228.6	-855.5	-1,576.3
Estonia	-137.8	-127.0	-89.6
Finland	-160.6	-632.4	-1,447.9
France	-3,055.9	-7,648.3	-3,638.6
Germany	3,711.9	-6,626.2	-13,025.7
Great Britain	-65,139.0	-7,351.7	-7,210.3
Greece	4,934.1	-482.5	-633.8
Hungary	-3,969.7	-999.5	-354.5
India	18,414.1	282.8	-3,570.3
Indonesia	11,975.6	99.2	113.5
Ireland	-2,759.7	-1,061.4	-329.2
Italy	-6,527.0	-4,128.9	-4,992.6
Japan	93,877.6	-11,131.1	-6,245.2
Korea	-7,124.6	-2,682.4	-1,259.2
Latvia	-1,326.5	-376.2	-86.7
Lithuania	-609.0	-426.5	-229.7
Luxembourg	218.0	27.0	-336.5
Malta	-37.3	-25.9	-9.3
Mexico	-12,260.9	-652.2	-3,299.4
Netherlands	3,517.4	-542.1	-2,749.0
Poland	-15,452.0	-3,595.4	-792.4
Portugal	681.0	-577.9	-361.5
Romania	-3,877.9	-1,086.7	-407.8
Russia	-36,165.0	-4,659.5	-10,494.8
Slovakia	1,148.1	-250.3	-367.7
Slovenia	248.9	-150.1	-130.8
Spain	2,718.9	-3,993.0	-1,878.5
Sweden	-12,651.0	-2,699.1	-2,479.2
Taiwan	-1,013.1	-556.7	-737.8
Turkey	-2,400.0	-1,560.3	-403.1
United States	63,347.0	-34,629.0	-3,544.7

Source: Calculations based on the World Input-Output Database.

Table 7: Change in Bilateral Imports in Government Consumption, 2008-2009

Column is the Destination Country, Row is the Exporting Country

	U.S.		Japan		China		Canada	
	\$ Mill	%Δ	\$ Mill	%Δ	\$ Mill	%Δ	\$ Mill	%Δ
Australia	-322.0	-17.5	-633.1	-22.9	306.1	9.0	245.6	28.9
Austria	-139.0	-17.1	-18.6	-9.4	-134.1	-13.3	-8.2	-6.2
Belgium	-222.6	-15.7	-43.3	-19.7	-120.4	-13.4	8.9	5.0
Brazil	-743.0	-26.3	-40.4	-9.4	63.2	-5.4	-42.5	-18.6
Bulgaria	-15.2	-23.6	-3.1	-23.5	-5.8	-18.4	2.4	24.1
Canada	-4,068.4	-19.4	-241.8	-20.5	-285.7	-13.7		
China	-866.5	-3.9	-587.0	-9.2			-274.2	-10.8
Cyprus	-2.3	-15.6	-0.9	-14.8	-2.2	-13.2	-0.3	-12.3
Czech Rep.	-63.8	-16.6	-11.0	-18.3	-15.8	-7.8	-2.1	-4.5
Denmark	-145.3	-17.4	-22.6	-14.1	-102.2	-12.9	-4.4	-3.1
Estonia	-14.5	-37.3	-0.3	-3.1	-3.7	-16.7	-0.9	-19.9
Finland	-131.1	-19.7	-42.8	-23.2	-66.7	-13.9	1.7	2.2
France	-658.6	-14.4	-56.2	-7.6	-389.1	-13.3	105.7	10.3
Germany	-1,597.5	-17.3	-296.2	-16.0	-691.7	-10.7	-49.2	-3.8
Great Britain	-738.5	-10.1	-194.7	-18.6	-500.1	-16.0	28.0	2.0
Greece	-60.6	-19.6	-21.1	-33.8	-30.1	-21.7	2.7	8.5
Hungary	-26.8	-7.6	-9.6	-16.0	-6.9	-3.6	4.9	13.1
India	-181.3	-5.2	-76.8	-13.6	-298.4	-23.2	-22.5	-5.8
Indonesia	-105.7	-12.5	-185.0	-10.5	139.4	11.7	-6.4	-7.1
Ireland	-162.3	-8.8	52.5	19.9	-20.2	-4.6	16.4	6.5
Italy	-627.1	-20.2	-93.0	-17.8	-313.7	-15.5	15.0	3.5
Japan	-891.9	-11.1			-553.1	-6.7	-30.7	-4.1
Korea	-188.9	-6.8	-101.7	-9.4	-6.4	-0.1	-9.3	-4.0
Latvia	-11.7	-33.1	-1.5	-14.4	-0.4	-2.5	-0.2	-7.0
Lithuania	-15.5	-26.3	-5.3	-37.6	-14.0	-23.9	-2.6	-26.3
Luxembourg	-35.1	-23.7	-10.6	-27.6	-44.3	-11.5	0.2	1.5
Malta	-2.4	-14.2	-0.7	-21.1	-4.8	-5.2	0.1	4.9
Mexico	-2,537.5	-24.2	-72.7	-19.6	-12.7	-3.3	-47.6	-13.0
Netherlands	-235.9	-8.6	-70.3	-18.1	-119.0	-6.0	31.8	9.6
Poland	-83.6	-13.1	-20.3	-22.9	-32.8	-8.9	15.7	13.6
Portugal	-41.0	-14.9	-9.0	-23.6	-73.0	-13.2	-1.6	-2.7
Romania	-56.4	-29.5	-7.4	-18.8	-15.1	-16.8	0.5	1.1
Russia	-1,340.2	-33.0	-372.1	-26.4	-662.5	-24.2	-68.4	-21.1
Slovakia	-28.7	-23.2	-3.9	-19.8	-8.6	-12.8	-1.5	-8.5
Slovenia	-15.3	-22.3	-3.2	-24.1	-6.1	-15.6	1.1	13.1
Spain	-254.5	-19.7	-19.0	-7.1	-102.8	-12.9	14.2	7.8
Sweden	-265.5	-18.3	-32.3	-13.8	-165.5	-14.2	2.6	1.3
Taiwan	-268.8	-11.4	-52.5	-6.8	103.5	4.5	-122.8	-42.0
Turkey	-98.3	-20.4	-11.4	-16.8	11.0	6.5	0.3	0.6
United States			-468.2	-7.9	-530.6	-4.8	1,230.5	12.0
Rest of the World	-17,365.5	-31.5	-7,344.1	-33.3	-5,181.8	-19.3	-472.1	-14.6

Source: Calculations based on the World Input-Output Database.

Table 8: Change in Bilateral Imports by Exporting Country, 2008-2009

Column is the Exporting Country, Row is Destination Country

	U.S.		Russia		Germany		Indonesia	
	\$ Mill	%Δ	\$ Mill	%Δ	\$ Mill	%Δ	\$ Mill	%Δ
Australia	171.2	7.2	-72.9	-24.4	-44.1	-4.3	153.7	35.3
Austria	-24.2	-3.7	-210.2	-37.4	-386.5	-11.2	1.3	2.6
Belgium	-52.1	-3.6	-222.5	-34.4	-437.0	-14.2	-6.2	-8.4
Brazil	-15.3	-1.0	-143.3	-37.0	-39.3	-2.6	1.8	2.4
Bulgaria	-19.7	-26.2	-43.2	-18.5	-59.6	-26.6	-1.2	-21.2
Canada	1,230.5	12.0	-68.4	-21.1	-49.2	-3.8	-6.4	-7.1
China	-530.6	-4.8	-662.5	-24.2	-691.7	-10.7	139.4	11.7
Cyprus	6.3	12.9	-2.3	-10.3	2.1	2.8	0.5	18.7
Czech Rep.	89.7	19.7	-472.5	-64.2	-19.9	-1.2	5.9	24.8
Denmark	-1.4	-0.1	-126.5	-36.5	-109.0	-6.5	6.4	11.5
Estonia	-3.9	-10.1	-12.9	-17.2	-16.3	-18.5	-0.4	-14.4
Finland	50.1	7.8	-234.9	-32.5	-13.1	-1.0	-10.5	-29.4
France	-2.3	0.0	-869.9	-37.9	-989.0	-11.4	-13.4	-5.9
Germany	60.5	0.8	-1,738.7	-46.4			27.0	4.4
Great Britain	297.7	2.7	-675.7	-40.4	-1,291.7	-14.0	31.3	5.5
Greece	-130.0	-22.3	-89.9	-30.0	-32.8	-2.9	2.3	6.1
Hungary	9.1	2.0	-227.1	-36.6	-193.7	-15.2	0.4	2.4
India	162.8	15.1	-55.4	-26.8	-36.5	-8.3	29.3	20.0
Indonesia	18.8	4.2	-30.0	-19.1	-7.9	-2.5		
Ireland	4.9	0.2	-64.6	-34.2	-103.9	-15.1	-5.4	-21.4
Italy	-81.5	-3.1	577.9	37.9	-606.3	-11.9	6.8	3.2
Japan	-468.2	-7.9	-372.1	-26.4	-296.2	-16.0	-185.0	-10.5
Korea	-144.3	-4.9	-115.6	-20.7	-75.9	-8.2	42.7	7.5
Latvia	-13.3	-32.2	-62.3	-33.9	-34.6	-27.4	-0.6	-32.0
Lithuania	-16.5	-37.5	-115.3	-27.8	-41.9	-31.1	-0.7	-25.2
Luxembourg	14.2	12.0	-7.7	-31.6	1.2	0.5	0.5	10.0
Malta	3.7	25.2	-1.8	-15.8	4.2	15.0	0.0	5.6
Mexico	-109.5	-4.2	-44.5	-42.6	-50.0	-16.1	-0.2	-0.9
Netherlands	478.7	11.4	-288.5	-28.8	-309.0	-7.1	12.2	6.2
Poland	-79.7	-10.3	-564.1	-47.4	-735.3	-27.8	-4.6	-10.2
Portugal	-8.4	-3.2	-18.3	-15.4	-23.3	-4.0	-0.5	-2.7
Romania	-36.2	-16.1	-307.8	-50.3	-90.6	-11.1	-2.2	-14.1
Russia	-275.4	-29.7			-762.4	-39.5	-12.7	-16.2
Slovakia	8.9	5.3	-121.9	-31.6	-95.0	-15.3	1.9	7.9
Slovenia	-3.1	-3.3	-13.8	-21.2	-19.9	-7.2	-0.1	-1.1
Spain	103.6	3.0	-419.9	-35.2	-422.8	-9.3	20.5	13.9
Sweden	-51.0	-2.9	-215.5	-40.1	-310.0	-15.0	-1.3	-2.5
Taiwan	-31.1	-5.3	2.9	4.3	-36.0	-15.3	8.2	8.8
Turkey	9.0	1.6	-221.4	-19.9	-203.7	-16.0	3.8	6.4
United States			-1,340.2	-33.0	-1,597.5	-17.3	-105.7	-12.5
Rest of the World	-4,166.7	-9.6	-821.6	-12.6	-2,801.7	-13.7	-25.3	-1.0

Source: Calculations based on the World Input-Output Database.