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The significance of the OECD's work on Trade in Value-Added

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1. Introduction

Christine Lagarde said many interesting things in her Dimpleby lecture in February 2014, but perhaps the most interesting was: "...just look at the great linking of the global economy over the past few decades. ...we are now in a world of integrated supply chains, where more than half of total manufactured imports...are intermediate goods or services. A typical manufacturing company today uses inputs from more than 35 different contractors across the world."¹

The rapid development of integrated supply chains, or global value chains (GVCs), has revolutionised world trade in recent decades.^{2,3} GVCs are now a dominant feature of world trade and investment. The increase in GVCs means that a country's total exports of goods and services (as measured in the conventional trade accounts) increasingly rely on significant intermediate imports and, therefore, the value-added by industries in "upstream" countries. For example, a motor vehicle exported by country "A" may require significant parts (engines, seats etc.) produced in other countries. In turn, these countries could use intermediate inputs imported from other countries (steel, rubber etc.) to produce the parts they export to country "A".

GVCs have led to the emergence of "borderless" production systems which can be sequential chains or complex networks at global or regional levels. They are frequently developed through Foreign Direct Investment (FDI), in which a corporation acquires or creates or invests in a corporation established in another country. GVCs are typically coordinated by TNCs (transnational corporations), with cross-border trade of inputs and outputs taking place within their networks of subsidiaries, affiliates, contractual partners and arm's-length suppliers.

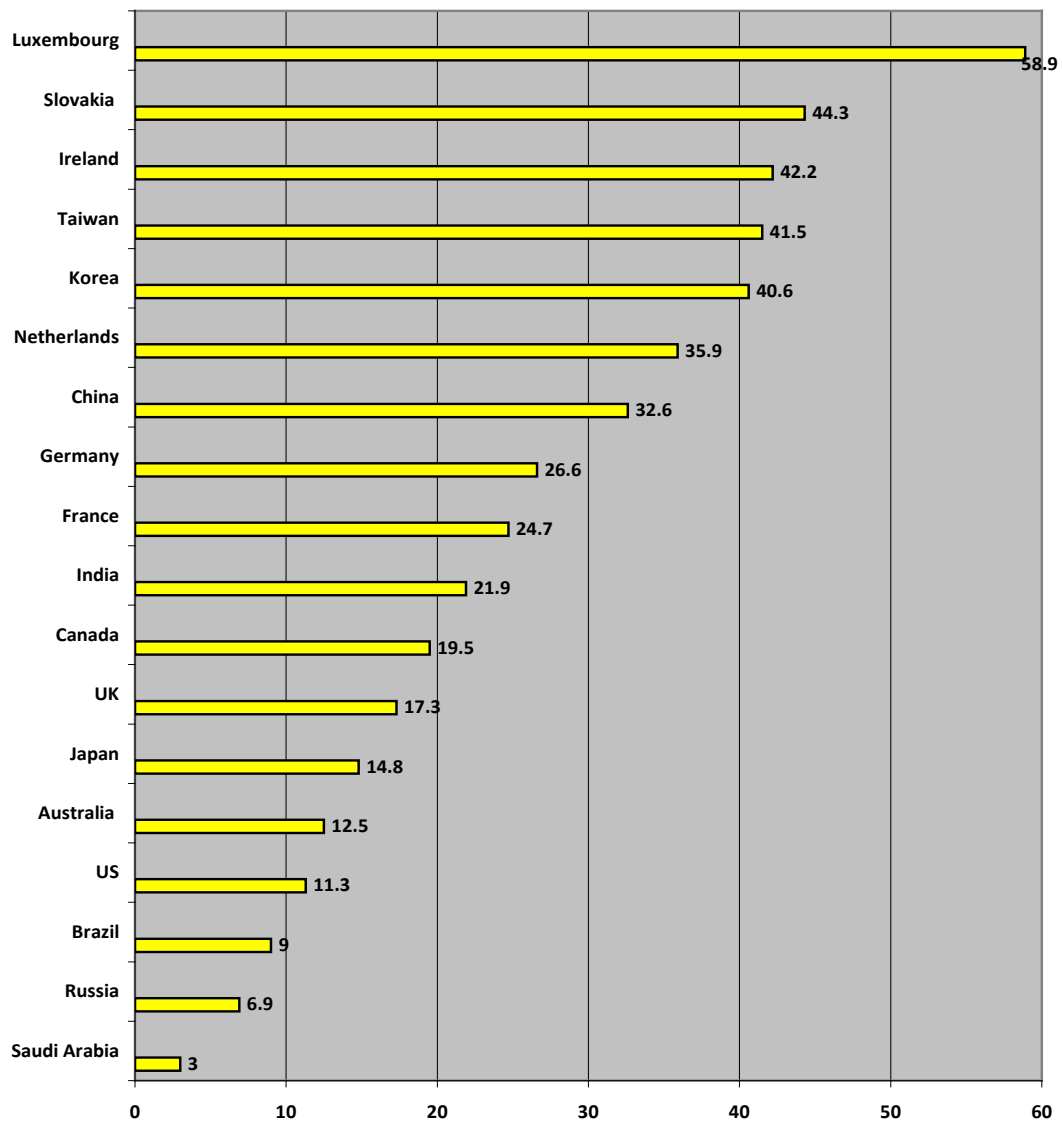
Reflecting the significance of GVCs, the OECD (with the WTO) has developed the "trade in value-added" (TiVA) analysis of overseas trade. The researchers have painstakingly calculated the value a country adds to the goods and services it exports, by subtracting the imported inputs (the foreign content) going into the production of those exports.^{4,5} Locating where the value in traded products is created gives a far truer picture of trading relationships than reflected in the conventional trade accounts.

2. *Import (foreign) content of gross exports*

Before looking at the actual trade data, it is useful to note how the foreign (import) content of gross exports varies from country-to-country. (Gross exports are exports of goods and services as measured in the conventional trade accounts.)

Chart 1 shows that the UK's import content is relatively low reflecting its specialisation in services, where the import content tends to be low. Primary producers (e.g. Saudi Arabia) also tend to have low import contents in exports. But Slovakia, for example, has very high import content in its exports, reflecting the semi-dependence of its transport equipment sector on foreign suppliers, not least of all German.

Chart 1 Foreign content of gross exports (goods & services, % of total), selected countries (2009)



Source: OECD-WTO Trade in Value Added (TiVA) database, May 2013. The OECD provided this analysis for the year 2009.

As already implied, conventional trade figures do not make allowances for the import content of exports (the value-added in “upstream” countries). Specifically:

- They are likely to exaggerate the contribution of exports to GDP for any country. The gross value of exports is likely to be greater than exports on a value-added basis.
- They are likely to distort a country’s bilateral export shares, bilateral import shares and bilateral balances, as discussed below.

3. *The OECD’s Trade in Value Added (TiVA) analysis: introduction*

The OECD’s Trade in Value Added (TiVA) analysis gets over these problems. The TiVA data give the correct figures for exports’ contribution to GDP and they correct the distortions to the bilateral data. The OECD work is nothing less than breakthrough in understanding trade flows.

The following examples, taken from an FCO blog, show how TiVA analysis corrects for the distortions in the conventional trade accounts:⁵

- The Airbus Effect (simplified scenario): the UK builds Airbus wings, and sends them to France for final assembly before the whole plane is exported to China:
 - *Conventional trade statistics* show the value of the wings as a UK export to France, and the entire value of the plane as a French export to China.
 - *TiVA* analysis shows the wings as a UK export to China, whilst the French export to China would exclude the value of the wings. This provides overall a better picture of who has done what in the production of the plane, but also of where the UK’s final markets are.
- The i-Phone Effect: i-Phones are assembled in China using imported components and intellectual property, and then exported to the US:
 - *Conventional trade statistics* count the total value of the i-Phone as a Chinese export to the US.
 - *TiVA* isolates the value-added by China from the imported content (some of which comes from the US).
 - Note: *TiVA* analysis for the whole of Sino-US trade in goods and services results in very different trade balances from the conventional accounts. As shown in charts 2a and 2b, the US trade deficit with China was \$189bn (conventional accounts) in 2009. On a *TiVA* basis it fell to \$126.5bn, a third lower.
- The Rotterdam Effect: many goods pass through Rotterdam before re-export:
 - *Conventional trade statistics*, therefore, tend to give distortedly high figures for exports to and imports from the Netherlands.
 - The *TiVA methodology*, by looking at where the final demand lies, overcomes this distortion in the data.

Chart 2a Bilateral trade balances, \$bn, China, 2009

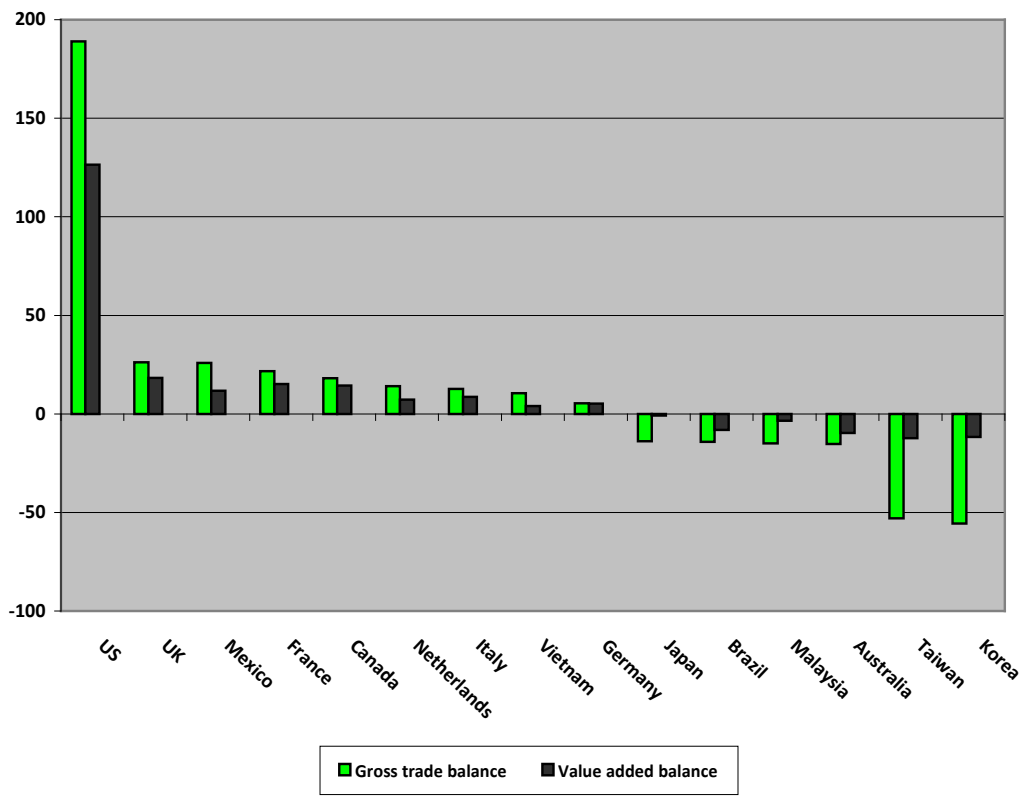
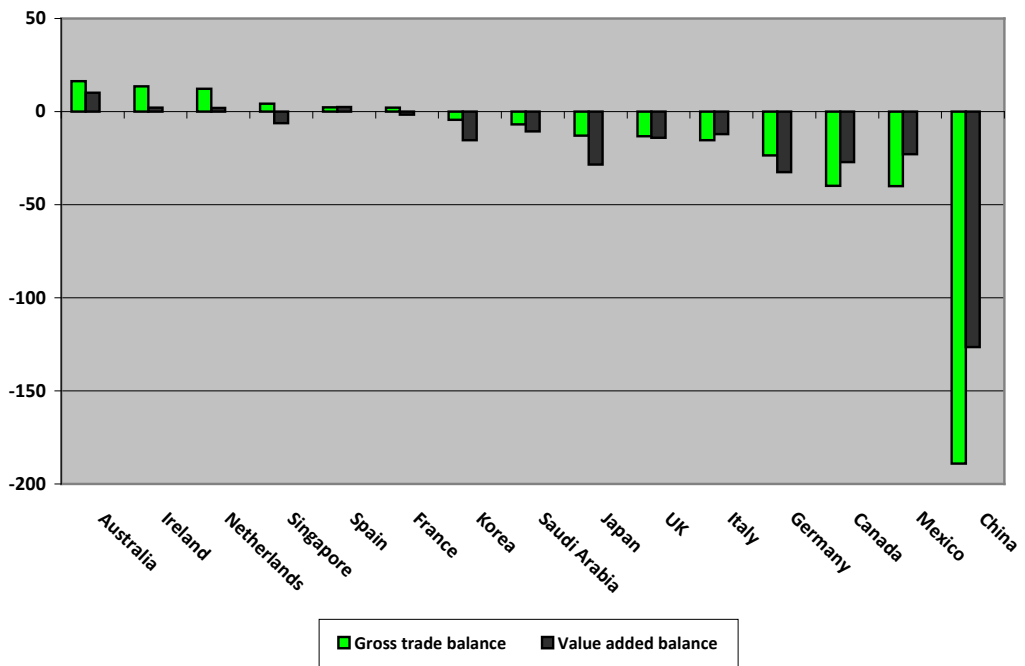


Chart 2b Bilateral trade balances, \$bn, US, 2009



Source: OECD-WTO Trade in Value Added (TiVA) database, May 2013.

4. The OECD's TiVA analysis: implications for the UK

Charts 3a and 3b and Annex Table 1 show the overall implications of the OECD's research for the UK.

The OECD TiVA analysis of UK-EU bilateral trade gives significantly different figures from the conventional accounts, for example. In 2009 the share of exports going to the EU was recorded 47.6% in the conventional accounts (gross terms). But on a value-added basis, the share fell to 41.2%. By way of contrast, the equivalent figures for UK-US exports were 16.2% (conventional accounts) and 19.1% (value-added). TiVA analysis tells us that trade with the EU is less important and trade with the US is more important than indicated by the conventional trade accounts.

Chart 3a UK exports, partner shares, in gross & value-added terms (% of total), 2009

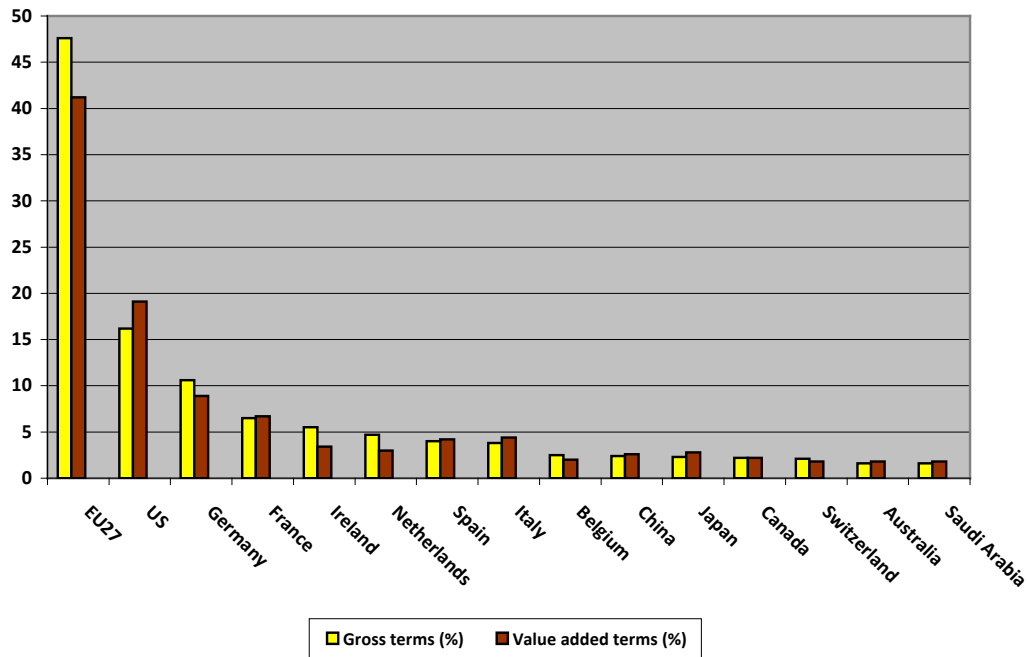
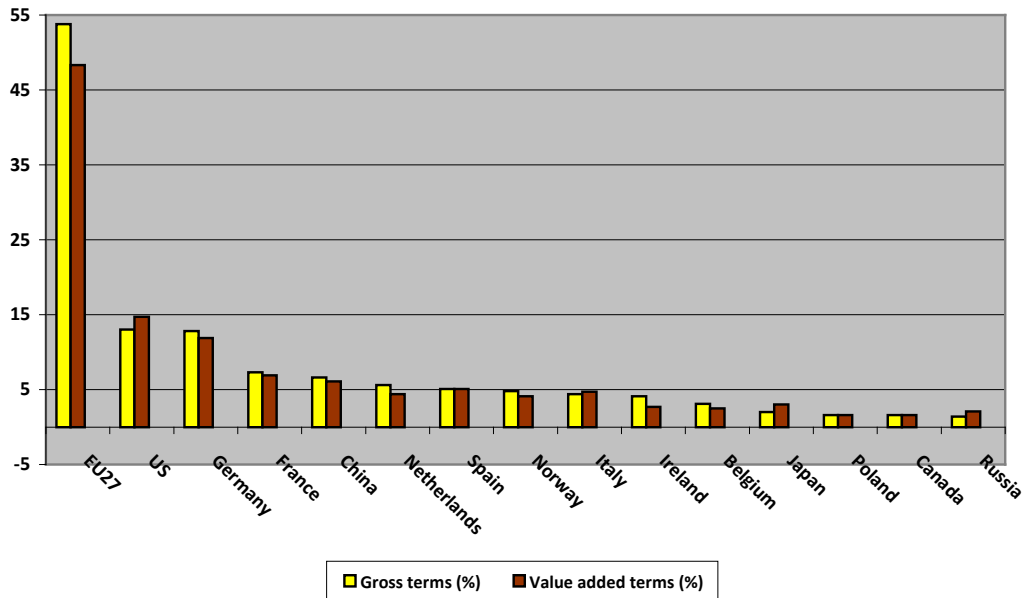


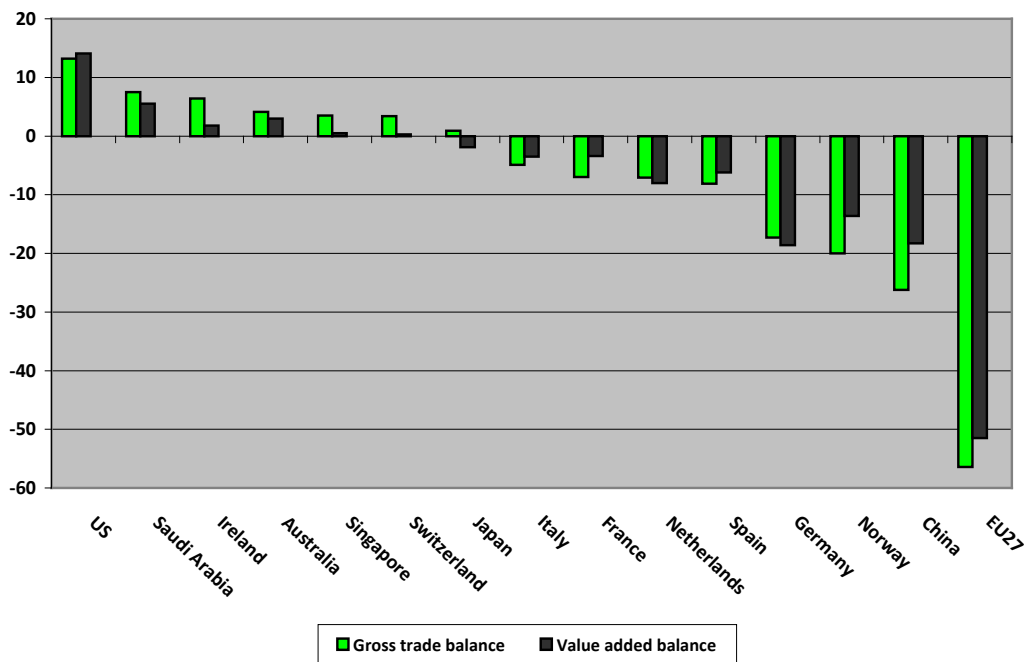
Chart 3b UK imports, partner shares, in gross & value-added terms (% of total), 2009



Source: OECD-WTO Trade in Value Added (TiVA) database, May 2013.

Chart 4 and Annex Table 1 show how some key bilateral balances differ, given the two ways of measuring bilateral trade. The differences between the results for the conventional accounts and the TiVA can be very significant, showing the degree to which the conventional accounts can distort the true trade flows. The TiVA data increase the UK-US surplus, for example, and decrease the UK-Chinese deficit.

Chart 4 Bilateral trade balances in gross and value-added terms, \$bn, UK, 2009



Source: OECD-WTO Trade in Value Added (TiVA) database, May 2013.

5 Exports as % of GDP

A much-quoted statistic relates to the contribution of UK exports of goods and services to the EU as a percentage of GDP. Annex table 2 shows the TiVA's implications for the exports to GDP ratio:

- On the ONS's conventional accounts the gross exports/GDP ratio was 28.4% in 2009. (But note that exports were depressed in 2009 owing to the Great Recession, and the ratio tends to be higher than this in a "normal" year.) The ONS's Pink Book showed 48.1% of exports went to the EU (the OECD analysis suggested 47.6%, but data get revised). Therefore, the ratio of exports to EU/GDP was 13.7% (=28.4% x 48.1%).
- Turning to the value-added data, firstly note that the domestically value-added (domestically produced) share of exports was 82.7% in 2009. (This is calculated by subtracting from 100% the 17.3% comprising the foreign content of exports, see chart 1 above.) The net exports/GDP ratio therefore dropped to 23.5% (=82.7% x 28.4%) in 2009. Moreover, the OECD calculated that the bilateral share to the EU was 41.2% (see annex table 1). The ratio of exports to the EU/GDP then falls to 9.7% (=23.5% x 41.2%) on TiVA basis.

Thus the 9.7% share (value-added) compares with a 13.7% share (conventional accounts) for 2009. The OECD/WTO work is indeed valuable in understanding the true contribution of exports to the EU to UK GDP.

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References

1. Christine Lagarde, Managing Director, International Monetary Fund, “A New Multilateralism for the 21st Century: the Richard Dimbleby Lecture”, 3 February 2014.
2. See OECD website, “Global Value Chains”, which explains “...international production, trade and investments are increasingly organised within so-called global value chains (GVCs) where the different stages of the production process are located across different countries. Globalisation motivates companies to restructure their operations internationally through outsourcing and offshoring of activities. Firms try to optimise their production processes by locating the various stages across different sites according to the most optimal location factors across countries. The past decades have witnessed a strong trend towards the international dispersion of value chain activities such as design, production, marketing, distribution etc.”
3. See also Ruth Lea, “The OECD-WTO “trade in value-added” research: a break-through in analysing world trade, *Arbuthnot Banking Group*, 17 February 2014.
4. OECD-WTO-UNCTAD report to G20, “Implications of Global Value Chains for trade, investment, development and jobs”, 6 September 2013. Report and press release.
5. OECD-WTO TiVA database, “FAQs: Background Note” defines “trade in value-added” as “...a statistical approach used to estimate the source(s) of value (by country and industry) that is added in producing goods and services for export (and import)”. Value-added “...reflects the value that is added by industries in producing goods and services. It follows the definition of value-added (in basic prices) used in the System of National Accounts (1993 SNA) and is equivalent to the difference between its output (in basic prices) and the sum of its intermediate inputs (in purchasers prices) of goods and services. It is equivalent to the compensation for labour (Compensation of Employees) and compensation for capital (Operating Surplus), and also includes a component for ‘Other taxes on Production’.”
6. Nick Bridge, “Transforming our Understanding of Trade”, January 2013”, <http://blogs.fco.gov.uk/nicholasbridge/2013/01/16/transforming-our-understanding-of-trade/>

Annex

Table 1 UK trade in goods & services, 2009

	Exports, share (%)		Imports, share (%)		Bilateral balances (\$bn)	
	Gross terms, conventional accounts	Value-added terms	Gross terms, conventional accounts	Value-added terms	Gross terms, conventional accounts	Value-added terms
EU28						
Austria	0.70	0.77	0.78	0.88	-0.8	-0.8
Belgium	2.49	2.02	3.05	2.52	-4.3	-3.3
Bulgaria	0.07	0.09	0.11	0.12	-0.3	-0.2
Croatia	Na	Na	Na	Na	Na	Na
Cyprus	0.11	0.12	0.14	0.13	-0.1	-0.1
Czech Republic	0.49	0.47	0.94	0.74	-2.9	-1.5
Denmark	1.35	1.13	1.25	1.20	0.1	-0.8
Estonia	0.03	0.04	0.06	0.07	-0.2	-0.1
Finland	0.67	0.58	0.65	0.55	-0.1	-0.1
France	6.54	6.74	7.27	6.88	-7.0	-3.4
Germany	10.61	8.89	12.78	11.93	-17.3	-18.6
Greece	0.81	0.95	0.62	0.60	0.8	1.3
Hungary	0.38	0.37	0.76	0.58	-2.4	-1.2
Ireland	5.52	3.36	4.09	2.72	6.4	1.8
Italy	3.85	4.40	4.41	4.75	-4.9	-3.5
Latvia	0.02	0.03	0.11	0.10	-0.5	-0.3
Lithuania	0.04	0.06	0.14	0.13	-0.6	-0.4
Luxembourg	1.11	0.23	0.87	0.43	1.0	-1.1
Malta	0.07	0.05	0.08	0.06	-0.1	-0.1
Netherlands	4.70	3.00	5.57	4.37	-7.1	-8.0
Poland	1.05	1.14	1.65	1.58	-4.0	-2.6
Portugal	0.59	0.63	0.68	0.59	-0.8	-0.1
Romania	0.26	0.32	0.27	0.31	-0.2	-0.1
Slovakia	0.29	0.19	0.53	0.40	-1.6	-1.1
Slovenia	0.06	0.09	0.10	0.11	-0.2	-0.1
Spain	4.00	4.16	5.09	5.07	-8.1	-6.2
Sweden	1.78	1.38	1.83	1.44	-1.1	-0.9
TOTAL	47.59	41.21	53.83	48.26	-56.4	-51.5
Other, selected						
US	16.2	19.1	13.0	14.7	13.2	14.1
China	2.4	2.6	6.6	6.1	-26.2	-18.3
Japan	2.3	2.8	2.0	3.0	0.9	-1.9
Canada	2.2	2.2	1.6	1.6	2.6	2.0
Switzerland	2.1	1.8	1.4	1.6	3.4	0.3
Australia	1.6	1.75	0.8	1.0	4.1	3.0
Saudi Arabia	1.55	1.8	0.2	0.5	7.5	5.5
Norway	1.5	1.4	4.8	4.1	-20.0	-13.6
India	1.4	1.75	1.3	1.4	-0.1	1.1
Singapore	1.4	0.7	0.7	0.6	3.5	0.5
Russia	1.1	1.5	1.4	2.1	-2.3	-3.9
Korea	1.0	1.0	0.7	1.0	1.5	-0.2
Turkey	0.9	0.9	1.4	1.4	-3.4	-2.4
South Africa	0.7	0.8	1.0	1.1	-1.9	-1.7
Brazil	0.6	0.9	0.7	1.0	-0.7	-1.0
Malaysia	0.6	0.5	0.4	0.5	0.8	-0.5
New Zealand	0.2	0.2	0.3	0.3	-0.6	-0.5

Table 2: UK economy: ratio of exports of goods and services to EU/GDP, 2009

	Conventional accounts (gross estimates), ONS data	OECD Trade in value-added (TiVA) data
Ratio of exports to GDP	402.171/1,417.359 (£bn) = 28.4% (ONS). This is low, usually 30-31%.	Foreign content of gross exports is 17.3% (chart 7); domestic content of exports is 82.7%. Ratio = 28.4% x 82.7% = 23.5%.
Ratio of exports of goods & services to EU28 (excluding Croatia) to total exports	£193.595bn/ £402.171bn = 48.1% (ONS). NB OECD calculated this as 47.6% (see table 1). There are frequently revisions in data.	Bilateral share = 41.2% (see table 1)
Ratio of exports to EU/GDP	28.4% x 48.1% = 13.7%	23.5% x 41.2% = 9.7%
Ratio of exports to EU/GDP	If share 31% of GDP = 31% x 48.1% = 14.9%	If allowing for unusually low exports in 2009, could be closer to 10.5%

Sources: (i) ONS database; (ii) ONS, "Balance of Payments Yearbook, 2103, Pink Book"; (iii) OECD, TiVA database.

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