

International trade, foreign direct investment and global value chains



2017

GUIDE

TO TRADE AND INVESTMENT STATISTICAL COUNTRY NOTES

This guide is designed to assist readers of the Trade and Investment Statistical Country Notes in their interpretation of the figures and data included in the country notes. It also specifies the data sources used and explains the calculations and assumptions made to create the charts and figures. These notes combine data from a number of different OECD databases, which are supplemented by national data sources in some cases. The variable codes from the OECD databases are shown in parentheses. Further information and country notes are available at www.oecd.org/investment/trade-investment-gvc.htm.

▶ **Figure 1: Growth rates of trade and GDP for the OECD and country of interest**

Data sources and calculations. The growth rates of export (P6), imports (P7) and GDP (B1_GE) are sourced from the National Accounts, annual data, Table 1.

▶ **Figure 2: Trade in value added terms, imports as a share of domestic final demand and exports as a share of GDP**

Imports and exports measured in value added terms give a better indication of the impact of trade on an economy than gross measures of imports and exports. Foreign value added embodied in domestic final demand reveals the amount of foreign value added present in the goods and services purchased for either final consumption or as investment by residents of the economy, either households, government or non-profit institutions serving households. It can be interpreted as the economy's 'imports of value-added'. Domestic value added embodied in foreign final demand captures the value added by domestic industries that reach foreign final consumers (i.e., households, government, and as investment); it includes both domestic value-added in direct exports of final goods and services as well as in exports of intermediates that reach foreign final consumers indirectly through other countries. It can be interpreted as 'exports of value added'.

Data sources and calculations. GDP is measured at basic prices and sourced from the National Accounts, annual, Table 1 (B1G_P119). The TiVA indicators used are: Foreign Value Added in Domestic Final Demand (-DFD_FVA) and Domestic Value Added in Foreign Final Demand (VALUX_FFDDVA), and are sourced from the OECD-WTO TiVA database.

▶ **Figure 3: FDI Stocks and income as a share of GDP**

Data sources and calculations. FDI statistics according to BMD4 are sourced from the FDI main aggregates summary tables of the OECD's FDI database. The total outward (inward) stock (LE_FA_F) and the FDI income receipts (payments) (T_D4P_F) are shown divided by the country's GDP. Statistics excluding the FDI to and from resident Special Purpose Entities (SPEs) are used when available.

▶ **Figure 4: FDI and GDP as a share of the OECD total, 2015**

Data sources and calculations. FDI statistics according to BMD4 are sourced from the OECD FDI database. The individual country's FDI outward (inward) stock are divided by total outward (inward) stock (LE_FA_F) for the OECD. . Statistics excluding the FDI to and from resident Special Purpose Entities (SPEs) are used when available.

▶ **Figure 5: Export and Import Intensity of domestic and foreign-owned enterprises**

The export intensity of a firm reflects the degree to which it sells to foreign customers, and the import intensity of a firm reflects the degree to which it uses foreign suppliers. Export (import) intensity for a firm is measured as exports (imports) divided by turnover (purchases). High trade intensity by foreign-owned firms suggests GVC integration, while low trade intensity by foreign-owned firms suggests market seeking by the MNE.

Data sources and calculations. Data are sourced from the OECD Trade by Enterprise Characteristics (TEC) database and the OECD's Activity of Multinational Enterprises (AMNE) database. Estimates of export (import) intensity of the firms in a country are derived by taking total exports (imports) by firm type (from TEC) and divide by total turnover (purchases) by firm type (from AMNE).

The TEC data by firm ownership are provided for only a subset of OECD members. These data are supplemented by data from national statistics offices of Canada and the United States and from the AMNE database for Japan. Included in the median are Austria, Canada, Denmark, Estonia, Finland, France, Hungary, Ireland, Italy, Japan, the Netherlands, Poland, Portugal, Slovakia, Slovenia, United Kingdom and the United States. To ensure representative samples are used in the calculations, only countries that report less than one third of exports as unknown by firm type are used in the calculations.

Caveats. The TEC data are for goods trade only. As a result, the trade intensity of foreign-owned firms is likely under estimated because the AMNE data on turnover (used in the denominator) covers both goods and services. Moreover, although there should be good coherence in coverage of firms (and sectors) within the TEC and AMNE datasets, there may be differences in practice in some countries.

▶ **Figure 6: Return on foreign investment, income receipts and payments as a share of inward and outward stocks, 2015**

A simple rate of return—total income over the total position—is shown for outward and inward FDI. The rate of return is an indication of the profitability of an investment. Rates of return on FDI can be compared to rates of return on other categories of investment or examined over time as an indication of whether investments are becoming more profitable. An insert chart is included reporting the countries return on inward and outward investment over time.

Data sources and calculations. Data are sourced from OECD FDI statistics according to BMD4. The rate of return is calculated as FDI income receipts as a percent of the outward FDI position.

Caveats. Comparing rates of return across countries can be problematic due to differences in the valuation of FDI positions and FDI income.

▶ **Figure 7: Goods exports by firm type, the role of foreign firms, domestic MNEs or domestic non-MNEs**

Data sources and calculations. Data are sourced from the OECD Trade by Enterprise Characteristics (TEC) database. The value of goods exports by firm type is divided by the total amount of goods exports recorded in TEC data (excluding unknown category). To ensure representative samples are used in the calculations, only countries that report less than one third of exports by firm type as unknown are used in the calculation.

▶ **Figure 8: Export Orientation, foreign affiliates' value added and import content of exports**

The domestic value added in foreign final demand as a share of total value added (blue bar) reflects a country's export orientation; countries with a higher share rely more on foreign markets to consume their production. The import content of exports (green triangle) reflects the contribution of foreign suppliers to the total value of a country's exports. Typically, a higher import content of exports indicates greater GVC integration. Larger economies, those with significant mineral resources, and those that are relatively far from foreign markets and suppliers, tend to have higher domestic (and lower foreign) value added content in their exports than other economies. The share of value added produced by foreign-owned firms (grey diamond) reflects the importance of foreign-owned firms in the production of the economy. (The AMNE database mainly reflects the private sector in the economy but excludes the agricultural industry.)

The positive correlation across these three indicators suggests countries with high inward investment tend to be more export orientated and have a higher import content of exports. This suggests that inward investment can be an important channel for GVC integration. The inserted chart reports the country's export orientation over time.

Data sources and calculations. This chart combines three indicators from the AMNE and TiVA databases: value added (VAC) by ownership from AMNE; and the domestic value added

in foreign final demand (VALUX_FFDDVA) and foreign value added content of exports (EXGR_FVASH) are taken from TiVA.

Caveats. The positive correlation between the three measures does not tell the complete story of GVC integration, particularly for larger economies. Larger OECD economies often rely less on foreign markets to consume their production as their producers focus more on serving the large domestic market. Second, larger OECD economies are more likely to receive foreign investment that is (home) market seeking. Finally, larger OECD economies are often home to MNEs that are investing in affiliates abroad, another channel for integration into GVCs.

▶ **Figure 9: Exports by ownership and their contribution to income, as a share of GDP**

An important question about GVCs is where the income is generated along the GVC and who receives that income. This chart explores the share of domestic value added in exports produced by domestic companies and by foreign-owned companies for those OECD economies where data are currently available, and further breaks down the portion produced by foreign-owned companies into labour compensation - which is most likely to remain in the host economy - and operating surplus - which can potentially be repatriated to parent companies abroad. As such, even trade measured in value added terms can overstate the real impacts of trade on an economy.

The chart is sorted according to the domestic value added in exports that remains in the economy, and illustrates that the wages paid by foreign-owned firms often make a significant contribution to the domestic value added in exports of countries. Nevertheless, countries where foreign-owned firms play a larger role also have a higher share of domestic value added in exports that can be repatriated. Other factors that affect the amount that can be repatriated include the export intensity of foreign-owned firms and the share of profits in the value added of foreign-owned firms. (The inserted chart reports the values for that country over time.)

Data sources and calculations. Data are sourced from the OECD AMNE database: value added by foreign owned firms (VAC), labour and personnel costs of foreign-owned firms (PEC) and gross operating surplus (GOS); and TiVA: domestic value added in foreign final demand (DVA_FFD).

AMNE data provides data on the share of value-added generated in a sector split between domestic and foreign owned firms. This share is applied to TiVA estimates of domestic value added in foreign final demand (by sector) to determine the value added of domestic-owned firms (blue bar in the chart). The remaining value-added produced by foreign owned firms is split using AMNE operating surplus and labour cost shares to estimate value added associated with labour and personnel costs (green bar) and the gross operating surplus or profits (grey striped bar).

Caveats. The share of domestic value added in foreign final demand accounted for by foreign-owned firms is likely understated because foreign-owned firms are likely more export-intensive than domestic firms.

▶ **Figure 10: Supplying markets through trade and investment: a broader perspective**

This chart provides a broader perspective on a country's 'export' orientation by recognizing that sales through foreign affiliates should be considered in conjunction with exports to obtain a complete picture of the global business activity of a country and of the role MNEs play in delivering goods and services to international markets. Specifically, it recognises that FDI income results from MNEs' active role in producing goods and services. This distinguishes it from other, more passive types of investment income, such as portfolio investment income.

For trade, the chart includes the value added by domestic-owned firms that serve foreign final demand and the labour costs of foreign-owned firms associated with exports; this is the domestic value added from exports that likely remains in the economy (see also above). To this it adds FDI income receipts. These receipts represent the 'repatriated' income that is earned by parent resident companies from the sales of their foreign affiliates--these are the profits of foreign affiliates that can be repatriated. For information, the chart also shows the FDI income payments that foreign-owned firms in the economy paid to their foreign investors. These are the profits of foreign-owned firms in the economy that can be repatriated.

Hence, when an economy is a net recipient of FDI, this measure will generally be lower than the measure of export orientation from TiVA (and shown in figure 8), but it will generally be higher when an economy is a net outward investor. As a result, this broader measure can provide a more complete picture of the international orientation of the economy and should better reflect the international integration of countries that are home to MNEs or are at the start of GVCs. Looking at this broader measure rather than the trade only measure reduces the range across OECD countries as many of the countries with high export orientations are net recipients of FDI while many of those with low export orientations are home to large MNEs with significant investments abroad.

This broader measure moves towards a national income, or ownership, perspective, by focusing not on the income generated within the boundary of the economy but on the income earned by citizens and companies of the country whether they are operating in the economy or overseas. It can serve to illustrate the role that trade and investment have played in the evolution of national income over time. It also serves to illustrate that some countries with traditionally high export orientation may not receive as much income from the global economy.

Furthermore, this broader notion of trade is important from a statistical point of view as the distinction between conventional "cross border trade" and investment income is increasingly blurred. For example, transactions in intellectual property within an MNE can be recorded as either trade in services or implicitly as direct investment income. (The inserted chart reports the values for the country over time.)

Data sources and calculations. Data are sourced from the OECD AMNE database: value added by foreign owned firms (VAC), labour and personnel costs of foreign-owned firms (PEC) and gross operating surplus (GOS); FDI statistics: income receipts and payments (T_D4P_F); and TiVA: domestic value added in foreign final demand (DVA_FFD).

AMNE data provides data on the share of value-added generated in a sector split between domestic and foreign owned firms. This share is applied to TiVA estimates of domestic value added in foreign final demand (by sector) to determine the value added of domestic-owned firms (blue bar in the chart). The remaining value-added produced by foreign owned firms is split using AMNE operating surplus and labour cost shares to estimate value added associated with labour and personnel costs (grey bar) and the gross operating surplus or profits (green bar below the line). To incorporate the income that a country receives due to its affiliates' activity overseas, FDI income receipts are added (light blue bar). This represents the profits repatriated to MNEs by their affiliates operating overseas, i.e., the profit that they earn from serving foreign markets. Each of these values is shown as shares of GDP measured at basic prices (B1G_P119).

Caveats. The share of domestic value added in foreign final demand accounted for by foreign-owned firms is likely understated because foreign-owned firms are likely more export-intensive than domestic firms.

The amount of FDI income receipts is overstated for countries that have significant amounts of pass-through capital as some of their income receipts represent income passing through the economy along the ownership chain and, thus, this measure would overstate the international orientation of such economies.

The measure is not a full move towards GNI because it does not include all forms of international investment income. However, by focusing on FDI income, it does capture the income from companies actively involved in the producing of goods and services for sale in international markets.

Not all FDI income receipts are from serving foreign markets as some sales of foreign affiliates return to the home country. Data from the United States indicate that this is likely relatively small as the United States was the destination of just 10% of sales of foreign affiliates in 2014.

It is assumed that FDI income receipts in a given year approximate the profits (that can be repatriated) generated by foreign affiliates abroad in the same year.

Figure 11: How foreign firms serve your market--a value added perspective

Foreign firms can serve a market through two channels: trade and sales by foreign affiliates. This chart shows the importance of these two channels to different economies and is measured in value added terms. The chart further splits the value added of foreign-owned firms that is sold domestically into labour costs and gross operating surplus, or profits.

Data sources and calculations. Data are sourced from the OECD AMNE database: value added by foreign owned firms (VAC), labour and personnel costs of foreign-owned firms (PEC) and gross operating surplus (GOS); TEC: goods exports by foreign-owned firms (F); and TiVA: foreign value added in domestic final demand (FVA_DFD). The variables are scaled by GDP measured at basic prices (B1G_P119).

The foreign value added in domestic final demand (blue bar) is the country's imports of value added; it is scaled by GDP to indicate the extent to which foreign firms serve the market through trade.

AMNE data provides data on the share of value-added generated in a sector split between domestic and foreign owned firms. To measure the sales by foreign affiliates that serve the domestic market, the value added by foreign-owned firms (VAC) is multiplied by (1-export intensity* of foreign-owned firms). This gives an estimate of the value added produced by foreign-owned firms that is not exported, i.e., that is sold domestically.

To split the sales by foreign affiliates that are sold domestically into “profits and wages”, the shares of the labour and personnel costs and the gross operating surplus in the total value added by foreign-owned firms are applied to the estimates of value added by foreign-owned firms that is sold domestically to create the values for “wages” or the share of labour costs in VA by foreign owned firms – sold domestically” (green bar) and “share of profits in VA of foreign-owned firms – sold domestically” (grey striped bar).

Caveats. The share of value added of foreign-owned firms that is sold domestically is an upper bound because domestic sales can include intermediate products that are exported indirectly.

Typically relative to GDP, foreign supply will account for a larger share in smaller economies than in larger.

▶ **Figure 12 and 13: Outward (inward) trade, a value added and gross comparison**

Gross bilateral trade figures can disguise the true nature of trade interdependencies, particularly in relation to final consumers in one country and producers at upstream parts of the value chain. This chart compares the gross and value added trade values for main trading partners.

Data sources and calculations. Data are sourced from the TiVA database, gross exports and imports (EXGR and IMGR), domestic value added in foreign final demand (DVA_FFD), and foreign value added in domestic final demand (FVA_DFD). These charts report the top ten export (import) partners on a gross and value added basis.

▶ **Figure 14: Supplying the market via trade and investment.**

Foreign firms can serve an economy through trade or by sales of foreign affiliates; bringing these trade and investment perspectives together can shed a different light on who a country's most important partners are.

Data sources and calculations. Data are sourced from AMNE: value added by foreign owned firms (VAC); TEC: goods exports by foreign-owned firms (F); and TiVA: foreign value added in domestic final demand (FVA_DFD).

The foreign value added in domestic final demand, (blue bar) is scaled by GDP measured at basic prices. This value represents how foreign firms serve your market through trade.

* See details on Figure 6 for calculations of export intensity.

To measure the sales by foreign affiliates; take the value added by foreign-owned firms VAC, and multiply it by $(1 - \text{export intensity}^\dagger)$ of foreign-owned firms). This gives an estimate of the value added produced by foreign-owned firms that is not exported onwards, or that is sold domestically. The latest available value for export intensity is used due to limitations of TEC data availability.

Caveats. The domestic sales of foreign affiliates can include intermediate products that are exported indirectly; hence, this estimate should be considered an upper bound.

Note on industry level estimates: The TiVA ICIO 34 industry breakdown is used; the conversion tables at the end of this document are used when converting differing ISIC classifications to this breakdown. The chemicals industry includes pharmaceuticals.

▶ **Figure 15: Top exporting manufacturing industries in the country**

As in figure 8, this chart shows the generally positive relationship between exporting, importing, and the presence of foreign-owned firms for the top export manufacturing industries in the country.

Data sources and calculations. Data are sourced from AMNE: value added of foreign-owned firms (VAC) and TiVA: the foreign value added of exports (EXGR_FVASH), exports (EXGR), and imports (IMGR).

Exports by each industry are measured as the share of total exports for all manufacturing industries; the equivalent calculations are performed for imports and the value added by foreign-owned firms. The import content of exports is reported as the industry share and shown on the right hand axis. The chart is sorted on the industry share of exports in total manufacturing exports. The share of value added by foreign-owned firms reflects the relative presence of foreign ownership in that industry compared to other manufacturing industries.

▶ **Figure 16: Import content of exports and export orientation by industry**

Imports and exports often go hand in hand; those industries that export more of their value added are also often those that have a higher import content in their exports.

Data sources and calculations. Data are sourced from the TiVA database: the import content of exports (EXGR_FVASH) and the domestic value added in foreign final demand (DVA_FFD). The chart plots the two TiVA indicators against each other.

▶ **Figure 17: Foreign-owned firms and import content of exports, by industry**

The import content of exports can be an indicator of GVC integration, and foreign firm presence can also be a vehicle for GVC integration; a positive relationship in this chart illustrates those industries where inward investment contributes to GVC participation. A high import content of exports and low importance of foreign-owned firms suggests domestic firms are driving the GVC integration and possibly located at the start of the GVC.

[†] See details on Figure 6 for calculations of export intensity.

Data sources and calculations. Data are sourced from the AMNE database: the share of value added by foreign-owned firms in the value added of an industry; TiVA (EXGR_FVASH). The chart plots the share of value added of foreign-owned firms against the import content of exports.

► **Figure 18: Gross trade in goods by enterprise ownership and industry**

This chart presents the top five import and export manufacturing industries. It splits the trade by firm type into foreign-owned enterprises, domestic MNEs, and domestic non-MNEs. Higher shares of domestic MNEs in trade suggests that that industry (country) is at the start of the GVC.

Data sources and calculations. Data are sourced from the Trade by Enterprise Characteristics (TEC) survey (Table 7) trade by ownership for exports and imports of goods. Trade by foreign-owned enterprises corresponds to (F), domestic MNEs (DM) and domestic non-MNEs (DI). The value of goods exports by firm type is divided into the total amount of goods exports recorded by TEC data (excluding unknown category).

► **Figure 19: Services content of gross exports for OECD countries**

Data sources and calculations. Data are sourced from the TiVA database of the overall services content of exports, split between the domestic and foreign value added (EXGR_SERV_DVASH EXGR_SERV_FVASH).

► **Figure 20: Value added of foreign-owned firms in services sectors and DVA of services in exports**

The positive relationship between the two series indicates that countries where foreign firms are concentrated in the services sectors typically have a higher share of domestic services in exports.

Data sources and calculations. Data are sourced from the AMNE database: the value added by foreign-owned firms in total value added by foreign owned firms (VAC); TiVA: the domestic services value added content of exports, (EXGR_SERV_DVASH).

Industry breakdown for the 2015 Trade in Value Added (TiVA) indicators¹

Aggregate 18 industry list		ICIO 34 industry list		ISIC Rev.3 ²	approx. ISIC Rev.4 ³
Agriculture, hunting, forestry and fishing	1	1	Agriculture, hunting, forestry and fishing	01, 02, 05	01, 02, 03
Mining and quarrying	2	2	Mining and quarrying	10, 11, 12, 13, 14	05, 06, 07, 08, 09
Food products, beverages and tobacco	3	3	Food products, beverages and tobacco	15, 16	10, 11, 12
Textiles, textile products, leather and footwear	4	4	Textiles, textile products, leather and footwear	17, 18, 19	13, 14, 15
Wood, paper, paper products, printing and publishing	5	5	Wood and products of wood and cork	20	16
Chemicals and non-metallic mineral products	6	6	Pulp, paper, paper products, printing and publishing	21, 22	17, 18, 58
		7	Coke, refined petroleum products and nuclear fuel	23	19
Basic metals and fabricated metal products	7	8	Chemicals and chemical products	24	20, 21
		9	Rubber and plastics products	25	22
Machinery and equipment n.e.c	8	10	Other non-metallic mineral products	26	23
		11	Basic metals	27	24
Electrical and Optical Equipment	9	12	Fabricated metal products except machinery and equipment	28	25
		13	Machinery and equipment n.e.c	29	28
Transport equipment	10	14	Computer, electronic and optical products	30, 32, 33	26
		15	Electrical machinery and apparatus n.e.c	31	27
Manufacturing n.e.c; recycling	11	16	Motor vehicles, trailers and semi-trailers	34	29
		17	Other transport equipment	35	30
Electricity, gas and water supply	12	18	Manufacturing n.e.c; recycling	36, 37	31, 32, 33
Construction	13	19	Electricity, gas and water supply	40, 41	35, 36
Wholesale and retail trade; Hotels and restaurants	14	20	Construction	45	41, 42, 43
		21	Wholesale and retail trade; repairs	50, 51, 52	45, 46, 47, 95
Transport and storage, post and telecommunication	15	22	Hotels and restaurants	55	55, 56
		23	Transport and storage	60, 61, 62, 63	49, 50, 51, 52, 79
Finance and insurance	16	24	Post and telecommunications	64	53, 61
		25	Finance and insurance	65, 66, 67	64, 65, 66
Real estate, renting and business activities	17	26	Real estate activities	70	68
		27	Renting of machinery and equipment	71	77
		28	Computer and related activities	72	62, 63
		29	Research and development	73	72
Community, social and personal services	18	29	Other Business Activities	74	69, 70, 71, 73, 74, 75, 78, 80, 81, 82
		30	Public admin. and defence; compulsory social security	75	84
		31	Education	80	85
		32	Health and social work	85	86, 87, 88
		33	Other community, social and personal services	90, 91, 92, 93	37, 38, 39, 59, 60, 90, 91, 92, 93, 94, 96
34	Private households with employed persons	95	97, 98		

1. While the 2015 version of OECD's Inter-Country Input-Output (ICIO) database is constructed with 34 unique industries, the 2015 TiVA indicators are presented using a hierarchical list combining the 18 aggregate industries, used for 2013 TiVA, with the new detail. Indicators for aggregates such as *Total manufactures* and *Total services* are also provided.