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Multinational enterprises and global value chains: New Insights on the trade-investment nexus

Charles Cadestin,

Koen De Backer,

Isabelle Desnoyers-James,

Sébastien Miroudot,

Ming Ye,

Davide Rigo

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MULTINATIONAL ENTERPRISES AND GLOBAL VALUE CHAINS: NEW INSIGHTS ON THE TRADE–INVESTMENT NEXUS CUTIVE SUMMARY

Charles Cadestin, Koen De Backer, Isabelle Desnoyers-James, Sébastien Miroudot,
Ming Ye and Davide Rigo

ABSTRACT

Because of their numerous and large activities across different countries, Multinational Enterprises (MNEs) are believed to be central and dominant actors in the global economy. In addition, it has been argued that the growing fragmentation of production within global value chains (GVCs) in the past decades is largely driven by MNEs.

It is remarkable then that despite their acclaimed importance, empirical evidence on MNEs is not widely available and largely incomplete, with data only available for a subset of OECD economies. Based on the new OECD analytical AMNE database including information on MNEs across 43 industries and countries on a bilateral basis, this paper derives new insights on the importance of MNEs today. As the new database also allows the linking with the OECD TiVA database, the new evidence additionally discusses in detail the trade and investment nexus within GVCs and suggests that MNEs' role in GVCs goes beyond trade and investment policy.

EXECUTIVE SUMMARY

The strong growth of global value chains (GVCs) in the past decades has dramatically challenged existing economic insights and policy implications related to globalisation. The role of Multinational Enterprises (MNEs), in particular, has attracted increasing attention from policy makers because of the numerous and large activities of these firms in several countries. But despite their acclaimed importance in today's global economy, empirical evidence on MNEs is not widely available and largely incomplete.

Theories of MNEs traditionally distinguish between horizontal and vertical MNEs. Horizontal MNEs are motivated by the desire to place production close to customers and avoid trade costs (market-seeking MNEs). Vertical MNEs undertake different stages of production in different countries to produce where it is less costly and have become especially important in GVCs following the decreasing coordination/transaction costs of production across borders (efficiency-seeking MNEs). The reality of MNEs though has become more complex than this horizontal–vertical dichotomy: most MNEs are engaged both in horizontal and vertical investments and are attracted to countries for other motives than access to large markets or lower costs (e.g. access to knowledge and technologies, specific financial and tax legislation etc.). Also, in addition to having their own affiliates abroad, MNEs are increasingly making use of arms-length contracts with independent partners (e.g. contract manufacturing, franchising and licensing, etc.). In the global economy of today, MNEs increasingly function as networks within the international production networks of GVCs; sometimes the boundaries and structure of GVCs will overlap with these of MNEs, but in many cases, there will be no perfect match.

The current evidence base is not detailed enough to analyse the trade-investment nexus within GVCs. In response to the growing demand of member states and international fora like the G20, the OECD aims to extend empirical evidence to develop a new narrative on MNEs in GVCs. To contribute to this effort and capture the complexity of MNEs in global production, STI and TAD have developed an analytical AMNE database that includes new indicators and inter-country input-output tables split according to ownership. These data make it possible to trace activities of MNEs and their foreign affiliates across countries with a value-added perspective, similar to the one applied to trade statistics in the context of the TiVA project.

This paper discusses the first results of this exercise and introduces new insights on the role of MNEs in the global economy. The database is still work-in-progress and will be further developed during the 2017-18 PWB. A number of important observations emerge from the first results:

- Between 2000 and 2014, global gross output of foreign affiliates grew from 7 to 20 trillion USD. This continuous growth of foreign production came to a halt during the economic crisis with a sharp contraction in 2009. MNE production has since then bounced back to its pre-crisis level but the post-crisis (2010-14) average annual growth rate (5%) is less than half of the pre-crisis (2000-08) growth.

- MNEs occupy an important role in the global economy of today, roughly accounting for one-third of global output and world GDP, and half of global exports; foreign affiliates are particularly active in exporting (more than MNE headquarters and domestic plants).

- Trade still seems to be the preferred entry mode to serve foreign markets with trade larger than sales by foreign affiliates.

- Foreign affiliates in host countries occupy different roles, which cannot be described in terms of (pure) horizontal and/or vertical activities. Not all MNE affiliates are part of the (physical) supply chain of MNEs by providing inputs or selling products. Instead, they play an important role when it comes to value creation at the firm level (by providing supporting services, knowledge creation, etc.).

- MNEs have many ways to access foreign markets; in addition to trade and local sales by affiliates, they increasingly also use other modes such as franchising, licensing and other forms of partnerships.

- Foreign affiliates create a considerable amount of value in host countries which is used for the remuneration of domestic production factors; in addition, foreign affiliates are also found to source inputs and services from domestic suppliers.

Just like the development of TIVA statistics has changed our understanding of trade and challenged existing trade policies, the new data presented in this report suggest that the MNE role in GVCs goes beyond trade and investment policy. A broader set of policies has to be revisited in light of new insights on how MNEs are organised and the role played by foreign affiliates in global production.

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MULTINATIONAL ENTERPRISES AND GLOBAL VALUE CHAINS: NEW INSIGHTS ON THE TRADE–INVESTMENT NEXUS

1. Background

The strong growth of Global Value Chains (GVCs) in the past decades has dramatically challenged existing economic insights and policy implications related to globalisation. The organisation of production in international networks which stretch out across multiple borders has resulted in a growing interconnectedness between countries with important impacts on a broad range of – national and international - policies (OECD, 2013). The expanded evidence base following the development of trade statistics in value-added terms (TiVA) has allowed for a re-evaluation of existing wisdom, particularly in the domain of trade policy. The position and role of the different actors in GVCs has remained underexposed largely because of the limited availability of empirical evidence on this. The role of Multinational Enterprises (MNEs), in particular, has attracted increasing attention from policy makers because of the numerous and large activities of these firms in several countries.

MNEs are nowadays among the most important actors in the global economy. A growing number of companies has been setting up affiliates abroad in order to serve local markets and/or benefit from favourable locations factors (natural resources, low labour costs, specialised knowledge, etc.) in other countries[1] (see Box 1). But despite their acclaimed importance in today's global economy, empirical evidence on MNEs is not widely available and largely incomplete, with information on MNE activities only available in a subset of OECD economies. Illustrative of the lack of data is the comparison that is often made between sales figures – which is a gross measure and easily found in annual reports - of a small number of (large) MNEs with the GDP (i.e. a net value-added concept) of smaller economies to describe the importance of MNEs.

Box 1. A bit of history - Why do companies become multinational?

While the origins of MNEs go back a long time – the British East India Trading Company, founded in 1600, is often considered as the first MNE, but the strong growth of MNE activities is of a more recent date. The first MNEs in the 17th century were directly motivated by home countries' trading activities and/or territorial acquisitions in Asia, Africa and the Americas. The modern MNEs as we know today, started to emerge only in the late 19th century following the industrial revolution. The combination of industrial capitalism, more capital intensive production methods, better storage and transportation during the 19th and 20th has resulted in growing international investment by US and European firms particularly to satisfy the exploding demand for natural resources (e.g. petroleum, minerals, agro-food).

MNE activity grew especially strongly after the Second World War, first dominated by US investment abroad, later followed by Japanese and European international investment. More recently, outward investment by emerging economies has also taken off, although the majority of outward investment is still concentrated among OECD economies. The growth in international investment has been facilitated by increasing trade and investment liberalisation, but also by the rapid progress in Information and Communication Technologies (ICT). New communication technologies have made it feasible and much cheaper for companies to coordinate and manage activities across large distances. Global estimates indicate that roughly 7,000 parent MNEs were counted in 1970 while in 2000 this number had jumped to 38 000. The most recent figure on non-financial transnational corporations by UNCTAD was 82 000 in 2008 (UNCTAD, 2010).

The (academic) literature on MNEs and international investment/business is vast and still evolving, hence it is impossible to give a complete overview of all the reasons that have motivated firms to set up affiliates abroad. Reflecting the complexity and diversity between MNEs, the theory of the MNE has evolved along different lines, depending on the unit of analysis and the stated hypothesis. Most of the elements put forward by different theoretical

developments have been brought together and structured in the so-called Ownership-Location-Internalisation framework (Dunning, 1993). Because of the generality of its propositions, the OLI framework provides a good understanding of the necessary conditions for MNE activity, although more recent development increasingly challenge its boundaries.

The rationale of this framework is that MNE activity is linked to three types of advantages. In the first place, MNEs need to possess ownership advantages, found in proprietary technology and knowledge, specific design, brand names, production processes, etc. MNEs have to be good in something as they have to overcome their liability of foreignness abroad (i.e. their unfamiliarity with local conditions). This ownership advantages explains to a large extent why MNEs are concentrated in knowledge-intensive industries.

Second, MNEs search and go after location advantages tied to a specific location (city, region, country). At the supply side, these are typically linked to the abundance of natural resources, a vast and cheap labour supply, access to specific knowledge in universities, research organisations, suppliers, etc. At the demand side, it is especially the size and the growth of the market that attracts a lot of companies to specific locations. Demand factors are often found to be the most important location factor of international investment.

Thirdly, so-called internalisation advantages have to exist; companies must find it more beneficial to vertically integrate abroad instead of setting up arms-lengths contracts with external partners like e.g. suppliers. This is often related to the protection of their proprietary technology and knowledge because of problems in contract legislation and enforcement, weak intellectual property rights, etc. in countries.

However, this internalisation advantage may have become less important today as firms increasingly rely on third-parties for their operations. It is related to a new shift in the recent period where MNEs have become more 'global' than 'multinational' (Palmisano, 2006). Rather than a collection of subsidiaries operating specific business lines or products or serving specific countries, MNEs are now globally integrated enterprises with an array of specialised units working together and in charge of specific business functions (such as procurement, manufacturing, sales or distribution). Each unit takes advantage of external partners to build capabilities, increase skills and competences and provide the best expertise for the global operations of the MNE.

MNEs are believed to be an important driver behind the international fragmentation of production within GVCs and the second unbundling (Baldwin, 2016). Theories of MNEs traditionally distinguish between horizontal and vertical MNEs. Horizontal MNEs are motivated by the desire to place production close to customers and avoid trade costs while at the same time realising economies of scale. They are multi-plant firms that produce similar outputs in both home and host countries, thereby economising on the costs of exporting (market-seeking MNEs). Vertical MNEs undertake different stages of production in different countries and have become especially important in GVCs following the decreasing coordination/transaction costs of production across borders (efficiency-seeking MNEs). The production in one country serves as input for production activities in other countries and the location of the different stages depend on where the factors of production they use intensively are relatively less costly (the cost advantage being often derived from scale economies or access to knowledge).

The relationship between international trade and investment has traditionally been a heavily discussed policy topic and the growing importance of MNEs has only intensified this. Originally, before GVCs, trade and investment were generally regarded as substitutes directly related to the trade-off between proximity and concentration (Brainard, 1997): when trade barriers are high, it is more profitable for firms to directly produce in the consumers' market through FDI. But by doing so, firms lose the advantage of concentration, which is related to lower costs when producing in one location (scale economies) and exporting products to all consuming countries. With the focus shifting from horizontal towards more vertical MNE activities in GVCs, the idea has gained ground that trade and investment have become rather complements instead of substitutes. For example, affiliates created to manufacture or distribute products need to import intermediates or finished products.

The reality of MNEs though has become more complex than this horizontal – vertical dichotomy: most MNEs are engaged both in horizontal and vertical investments abroad (Alfaro and Charlton, 2009) and most MNE affiliates have both horizontal and vertical characteristics (Herger and McCorriston, 2013; Ray, 2016). MNEs are attracted to countries because of different reasons (access to large and growing

markets of consumers, access to natural resources or specific technologies/knowledge, specific financial and tax legislation etc., - see OECD (2009) for a discussion of different location factors) and MNE affiliates accordingly fulfil different roles. Furthermore, some of these MNE affiliates are set up as greenfield investments while other affiliates are the result of mergers or takeovers (e.g. in order to get access to technology). To make it even more complex, in addition to having their own affiliates abroad, MNEs are increasingly making use of arms-length contracts with independent partners (e.g. contract manufacturing, franchising and licensing, etc.; UNCTAD, 2011).

Recent evidence suggests that the use of third-party suppliers is more prevalent within MNEs than originally thought. For example, using firm-level data, Ramondo et al. (2015) confirm that US MNEs have affiliates in sectors located upstream or downstream in their value chain (based on input-output information), but most of the time they cannot find corresponding evidence of intra-firm trade flow of goods that would be present if these affiliates were supplying the headquarters of the MNE directly. This evidence supports other studies suggesting that affiliates are often used to transfer capabilities rather than to produce inputs (Atalay et al., 2014). Affiliates in this case are set up in industries upstream or downstream because they share the same set of intangible inputs with the parent company, and not in order to fragment production in a vertically integrated structure.

In the global economy of today, MNEs increasingly function as networks within the international production networks of GVCs (Forsgren, 2007; Dicken, 2015); sometimes the boundaries and structure of GVCs will overlap with these of MNEs, but in a lot of cases there will be no perfect match. The set-up as a network across multiple borders provides MNEs with a large degree of strategic and operational flexibility. Within the purely intra-firm networks between the headquarters in home countries and affiliates in different host countries, products (good and services), capital, people, activities, knowledge, etc. are extensively exchanged and transferred across borders. Some parts of the MNE network will focus on production activities (e.g. some affiliates produce inputs for other affiliates in the MNE network, i.e. vertical MNEs) while others will mainly undertake sales activities (e.g. horizontal affiliates). In addition, a number of affiliates will be less involved in the pure production or sales activities, but rather in innovation and R&D activities, financial and tax operations or other support activities.

The current evidence base is not detailed enough to analyse the trade – investment nexus within GVCs. In response to the growing demand of member states and international fora like the G20, the OECD aims to extend empirical evidence to develop a new narrative on MNEs in GVCs. But it is clear that the reality is very complex and that the existing statistics on MNEs, which are incomplete, do not capture this complexity. The following exercise has applied a number of assumptions to overcome some of the shortcomings of existing data. This paper discusses the first results of this exercise discussing new insights on the role of MNEs in the global economy and GVCs in particular, hence should be considered as a first result of a work-in-progress to be undertaken during the PWB for 2017-18.

A number of important issues cannot be addressed unless more and better data become available. For example, trade within MNE networks consists of intra-firm trade (i.e. trade between MNEs and their affiliates) and trade between MNE headquarters/affiliates and independent partners. With data only available for a small number of countries and at a rather aggregate level, the distinction between both types of trade cannot be made (Lanz and Miroudot, 2011). Likewise, there are important income transfers between affiliates and parent companies related to intangible assets. Some of these payments are recorded as trade in services in the balance of payments and included in GDP data but others are earnings and not part of the output of MNEs. Fiscal optimisation strategies have increased the share of such earnings kept in affiliates abroad, thus distorting the measurement of production of MNEs (Guvenen et al., 2017). In the absence of more detailed data on income flows involving MNEs, it is not possible to correct for this at this stage.

2. The OECD analytical AMNE database

In order to provide more and better insights on the role of MNEs, the OECD Science, Technology and Innovation Directorate (DSTI) and the Trade and Agriculture Directorate (TAD) have jointly developed an analytical AMNE (Activities of Multinational Enterprises) database at the global level. STI has a long tradition and interest in the analysis of MNEs because of the close links between MNEs and R&D, innovation and Knowledge-Based Capital (KBC). Much of this work has been summarised in the *OECD Handbook on Economic Globalisation Indicators* (2005) which has underpinned the statistical collection of MNE data in the OECD, but also for Eurostat and increasingly also in other countries. The motivation for TAD to undertake this joint work is related to the close links that exist between international trade and investment (substitutes versus complements) and their effect on trade and investment policies. In addition, MNEs largely represent Mode 3 trade in services (i.e. through commercial presence). Furthermore, both STI and TAD have been leading actors in the OECD work on GVCs and TiVA and aim to provide more answers on the trade-investment nexus in GVCs demanded by delegates and international fora like the G20 (Box 2).

Box 2. OECD work on MNEs and GVCs

Over the years, demand has increased to better understand the link between investment and trade within GVCs and the specific role of MNEs in GVCs. Different OECD activities are contributing to this better understanding:[2]

- work on bringing firm heterogeneity into the OECD Inter-Country Input-Output (ICIO) database

- collection of ownership information within the supply-use tables framework underlying the next generation of the ICIO database and TiVA statistics

- work linking of FDI and TiVA statistics

- work focusing on the provisions found in bilateral and regional agreements and how they address the needs of businesses operating in GVCs.

The analytical AMNE database builds further on the existing AMNE database which contains the official data collected and published by National Statistical Offices. The coverage of AMNE data has been increasing over time, with a particularly good coverage for the United States and most EU countries (as an EU regulation obliges countries to provide AMNE data to Eurostat). The OECD AMNE database contains data for 32 OECD countries plus Costa Rica and Lithuania, over more than 50 industries with the first year of reporting 1985. However, information is not equally available across countries, industries and years with data typically less available for earlier years and more disaggregated levels (e.g. bilateral at industry level). In the absence of AMNE data for OECD and especially non-OECD countries, Foreign Direct Investment (FDI) statistics have typically been used. While FDI data have the advantage of being largely available since they are collected in the Balance of Payments, there are a number of important shortcomings of these data to analyse (the economic activities of) MNEs (see Box 3).

Box 3. Differences between FDI and AMNE statistics

As MNEs are the result from a decision to invest abroad, FDI statistics have often been used to study MNEs across countries and industries. The concepts and statistics of MNE and FDI capture a different reality however:

- FDI reflects the objective of obtaining a lasting interest by a resident entity in one economy ("direct investor") in an entity resident in an economy other than that of the investor ("direct investment enterprise"). The 'lasting interest' is operationalised by 10% or more of the ordinary shares or voting power. FDI statistics track the value of financial transactions (flows and positions) between direct investors and the direct investment enterprises.

- Activities of multinational enterprises (AMNE) refer to economic transactions (sales, value added, R&D, etc.) reflecting the overall operations of MNEs whether or not financed by the direct investor. The concept of the multinational enterprise is based on the concept of control and refers to 50% or more of the ordinary shares or voting power.

Because of these differences in concepts and statistics, FDI data represent a biased measure of foreign affiliate activity (Beugelsdijk et al., 2010; Ali-Yrkko and Leino, 2014; Blanchard and Acalin, 2016). First, FDI statistics provide information on cross-border capital flows which may be eventually sent to other countries without contributing at all to the local economy. This is especially the case for so-called Special Vehicle Entities (SPE) which function as a sort of central bank with MNE groups. A large presence of these SPEs in a country typically results in high FDI flows reported for that country without the corresponding economic effects. These SPEs also explain why FDI inflows and outflows are strongly correlated for these countries; recent initiatives have been taken to collect and present FDI data without SPEs. Second, FDI only measures part of what foreign affiliates use to finance their activities and excludes the – often - substantial amount they raise from local sources. Third, as FDI is a financial input hence excluding the contribution of labour, FDI stocks underestimate MNE activity in countries where labour is relatively more productive.

A first step in constructing the analytical AMNE database consists of the development of a full matrix of the output of foreign affiliates and domestic companies in 43 countries plus the 'rest of the world', in 43 industries from 2000 to 2014. The information on the production of foreign affiliates has been developed on a bilateral (home country – host country) basis. This matrix is constructed starting from the OECD AMNE database and complemented with additional national sources when available. The missing information is estimated by various statistical methodologies similar to that used to create services trade data. For example, a number of missing values have been estimated using a gravity estimation based on a model according to Bergstrand and Egger (2007). A separate document, to be published later, will discuss the development of the database in more detail including a full description of the methodology.

A number of papers has assembled similar bilateral datasets on MNE production, but not at the same level of disaggregation of countries and industries (Fukui and Lakatos, 2012; Ramondo et al., 2015; Alviarez, 2016; Federico, 2016). Furthermore, a correct linking between AMNE and GVC data requires data beyond production because of the differences in production technology between MNEs and non-MNEs. Academic research has indeed largely documented the significant difference between MNEs and non-MNEs – also within individual industries – with MNEs observed to be larger, more productive, more R&D intensive, paying higher wages, etc. Basically, this means that MNEs use a different production technology from domestic firms, with a different mix of inputs used and a different share of value-added. Not appropriately taking these differences into account in the Input-Output framework – which has been the case in previous work, will result in biased outcomes.

Similar matrices have also been developed for exports and value added across the same number of countries, industries and years, using the AMNE database, the Trade by Enterprise Characteristics (TEC)

database and a number of national sources. Based on these three matrices (output, exports and value-added ratios by country, industry and ownership), the WIOD tables[3] have been split according to domestic and foreign ownership within each country and industry. All three matrices on production, value added and exports have been made consistent with these measures in WIOD. Methods developed in the context of the creation of regional input-output tables allow recreating transactions between domestic-owned and foreign-owned firms.

3. The role of MNEs in the global economy

3.1 Growing production by foreign affiliates abroad

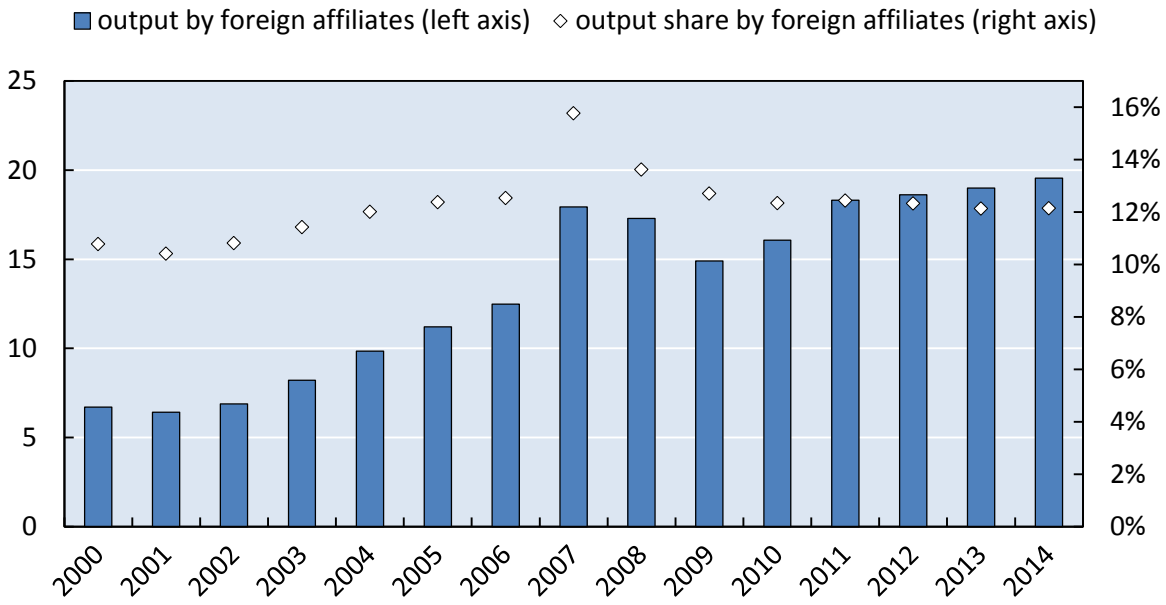
Between 2000 and 2014, global gross output of foreign affiliates grew from 7 to 20 trillion USD (Figure 1). This continuous growth of foreign production came to a halt during the economic crisis with a sharp contraction in 2009, just like global trade and FDI dramatically decreased in this period. MNE production abroad rebounded back to its pre-crisis 2007 level but the post-crisis (2010-14) average annual growth rate of 5% is less than half of the pre-crisis (2000-08) growth at 13 %. Many possible causes for this sharp slowdown have been discussed, but a general consensus has not been reached yet. The different voices of the debate can be roughly divided into two groups: those who argue that the slowdown is cyclical, reflecting weak aggregate demand; and, those supporting the claim that some structural change is at work and global trade has reached a "new normal".[4]

The smaller increase in MNEs' output as well as the sluggish growth in foreign direct investment (FDI) in recent years, is also interpreted by some as the retreat of the global company (The Economist, 2017). MNE activities seem indeed to have stagnated somewhat in most recent years, but it is unclear if this is enough to talk already about a structural shift in the global economy.

Production by foreign affiliates accounted for 12 % of global output in 2014, which is probably lower than expected (Figure 2). However, it should be taken into account that the production by affiliates abroad represents only one part of the MNE activity in the global economy (see below). As a result of the crisis the production share of foreign affiliates decreased by 4 percentage points between 2007 and 2010, suggesting that foreign affiliates were more affected by the global crisis than domestic-owned companies. This may be explained by the fact that foreign affiliates are highly engaged in GVCs, and, as a consequence their production is highly sensitive to shocks in final demand (Altomonte et al., 2012).

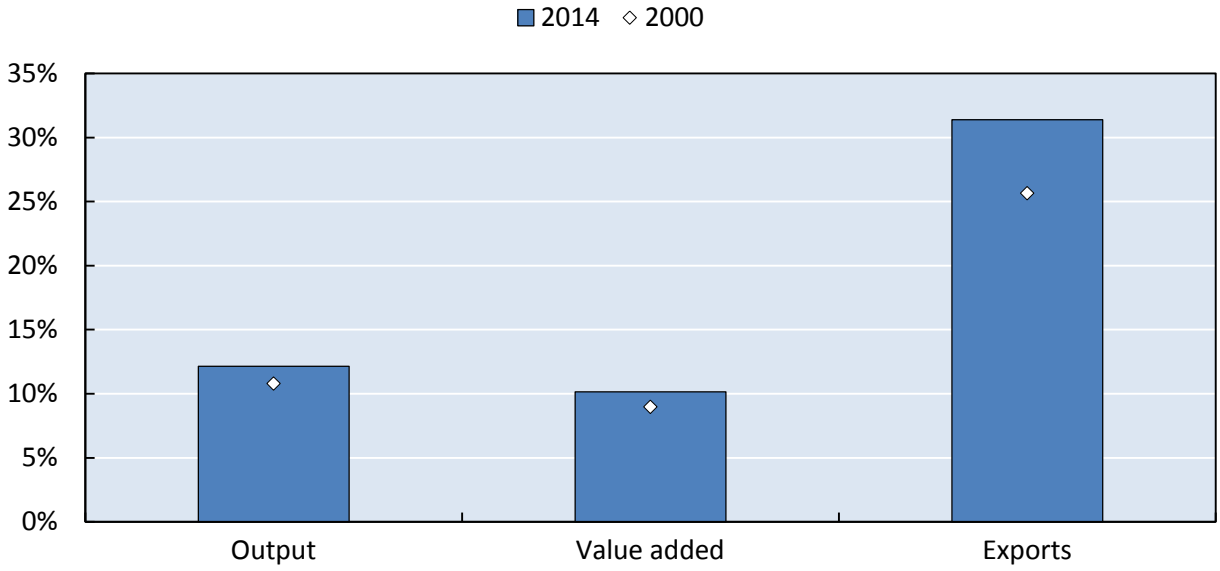
The importance of foreign affiliates in their host economies has overall remained quite stable since the year 2000 with only small increases in production, value added and exports between 2000 and 2014. The contribution of foreign affiliates is particularly high for exports accounting for one-third of total exports, underlining the importance of foreign affiliates in exports and imports of (some) countries. In addition to its share of 12% in global production, foreign affiliates also contributed around 10 % of global value added. In interpreting these figures, it should be taken into account that only a (very) small number of foreign affiliates are responsible for these substantial shares in production, value added and exports. For instance, in the European Union, foreign-owned firms account for around 1 % of the total population of firms.

Figure 1. Foreign affiliates' gross output and their share in global output, 2000 – 2014



Note: The left axis measuring foreign affiliates' output is in trillion of USD. Statistical offices mainly report turnover or sales in their official AMNE statistics and differ from production/output because of changes in inventories, work in progress and purchase of goods for resale (see Eurostat, 2012). The later has a particular importance for the distribution sector where most of the revenue constitutes of resales of purchased goods. The Eurostat Inward FATS database provides both variables and this has been used to derive output from official statistics on sales/turnover.

Figure 2. The share of foreign affiliates in global output, value added and exports, 2000 and 2014

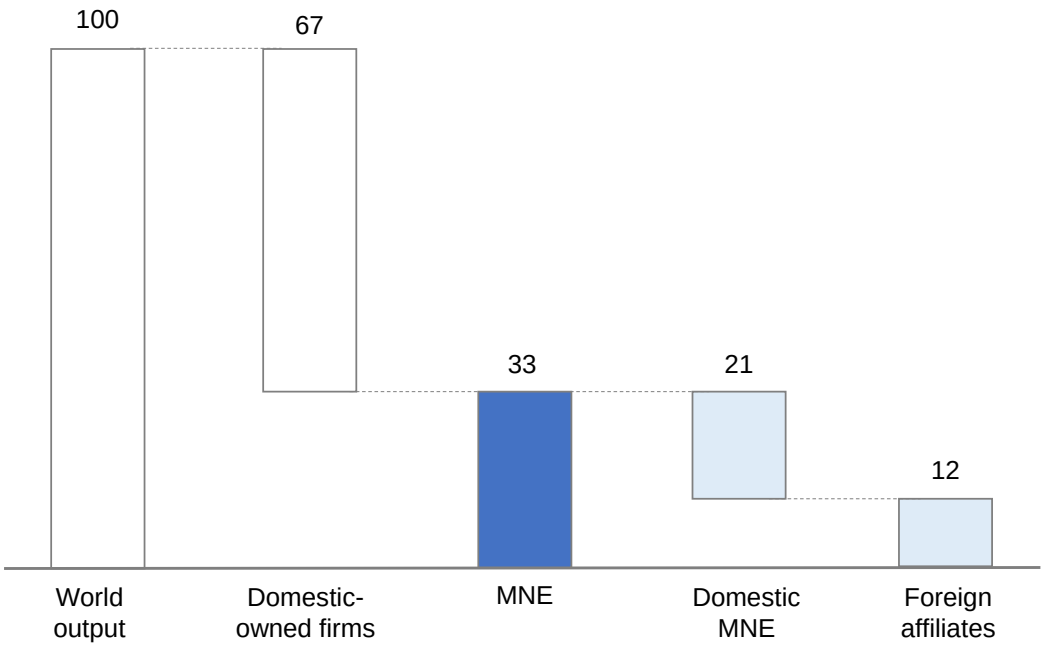


3.2 Importance of MNEs: foreign affiliates and headquarters

As noted above, foreign affiliates, i.e. the affiliates established in other countries by MNEs, represent only part of MNE activities in the global economy, and hence a review of their activities does not provide a complete picture of the role and importance of MNEs in the global economy. MNE headquarters and domestic plants in the home country of the MNE account for another large part of MNE activities. The information on home country activities is however more limited than for foreign affiliates abroad with only some countries collecting (consistent) data on MNE headquarters and domestic plants.[5] In order to get more complete insights on the importance of MNEs in the global economy, a back-of-the-envelope calculation[6] has been undertaken to provide an aggregate figure of total MNE production in 2014.

At the global level, MNEs and their foreign affiliates are estimated to produce 33 % of global output (Figure 3). While foreign affiliates account for 12 % of gross output, the MNE headquarters and domestic plants in the home country make up another 21 % of global output. When looking particularly at the business sector (thus excluding public administration and defence), the MNE share in global output rises to 38%. These estimates – the first global figure based on official AMNE data – demonstrate the importance of MNEs and their networks in today's global economy.

Figure 3. Decomposition of global gross output by ownership status, 2014

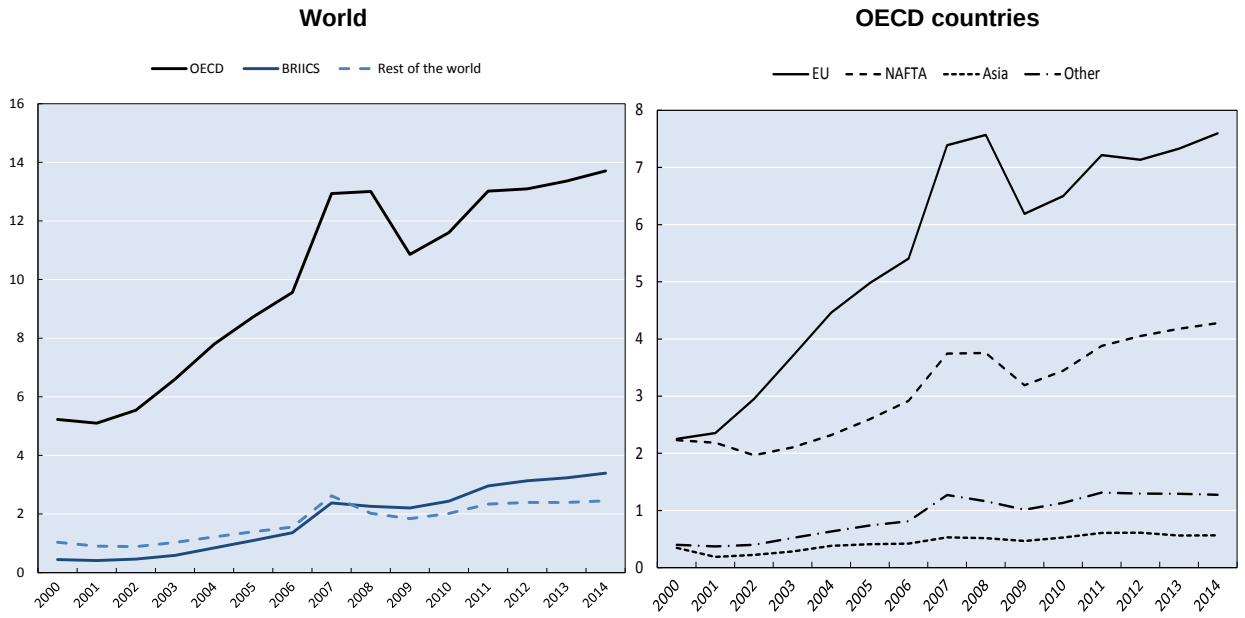


3.3 A host and home country perspective: OECD and emerging economies

OECD countries host the bulk of global foreign affiliates' output: about 70 % of foreign affiliates' output is produced in OECD countries, which amounted to roughly 14 trillion USD in 2014 (Figure 4). The European Union is by far the largest recipient of foreign affiliate activity, accounting for USD 7.5 trillion of output.[7] Foreign affiliates' activity has grown however the strongest in the BRIICS economies particularly after the economic crisis, with a 9 % average annual growth rate in the 2010-14 period. This trend is mainly driven by the expansion of foreign-owned companies in the People's Republic of China (hereafter "China").

Foreign affiliate activity in OECD countries has been severely affected by the global crisis. Especially, foreign-owned firms in the European Union have recovered to their pre-crisis level only in 2014 (Figure 4), this was mainly due to the recessionary environment in the Eurozone. In contrast, foreign affiliates in the United States already recovered (in 2011) to their pre-crisis level and have been rapidly growing after the crisis.

Figure 4. Gross output of foreign affiliates, world and OECD region, 2000-2014

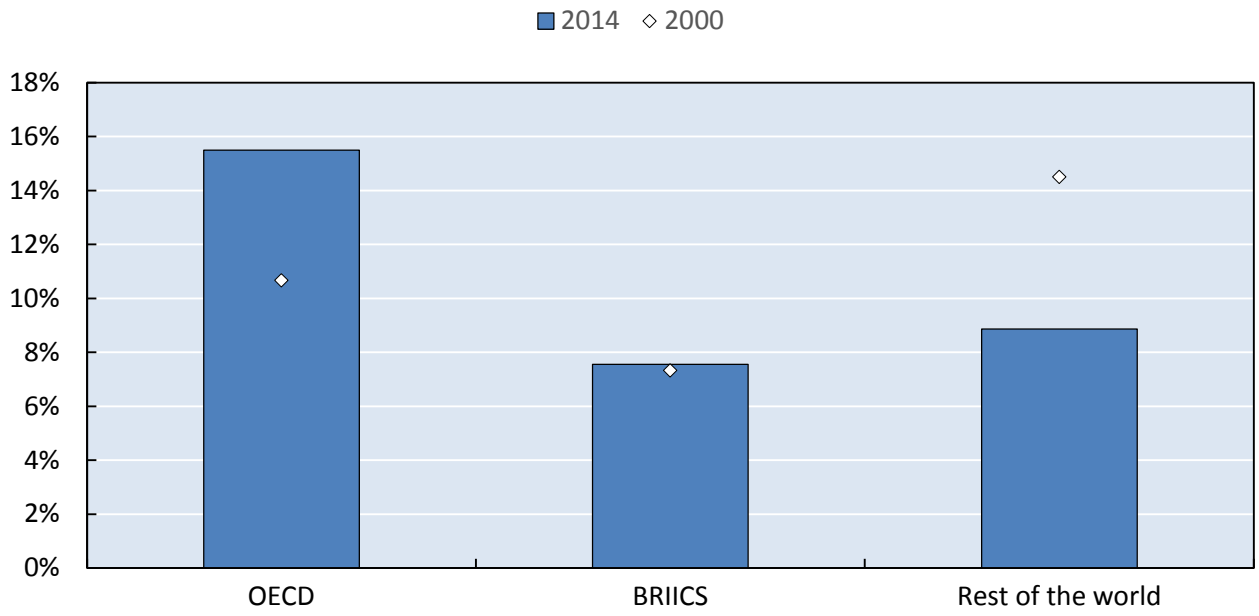


Note: Foreign affiliates' output expressed in trillion of USD. BRIICS includes Brazil, China, India, Indonesia and Russia.

The position and role foreign affiliates occupy in host economies differs across countries/regions (Figure 5). Foreign affiliates make up 15 % of gross output in OECD countries. In the European Union, foreign-owned firms account for almost one-fifth of output, as compared to 12 % of foreign affiliates in the NAFTA region. As a consequence of the creation of the single market, foreign affiliate production in Europe has grown by 9 % annually in the 2000-14 period, i.e. double the growth rate of foreign-owned companies in the United States. In the BRIICS countries, foreign affiliates contributed 8 % of production reflecting the large domestic markets in these countries. The importance of foreign affiliates has decreased in the Rest of the World, mainly reflecting the strong growth of (some) national economies in this group of countries.

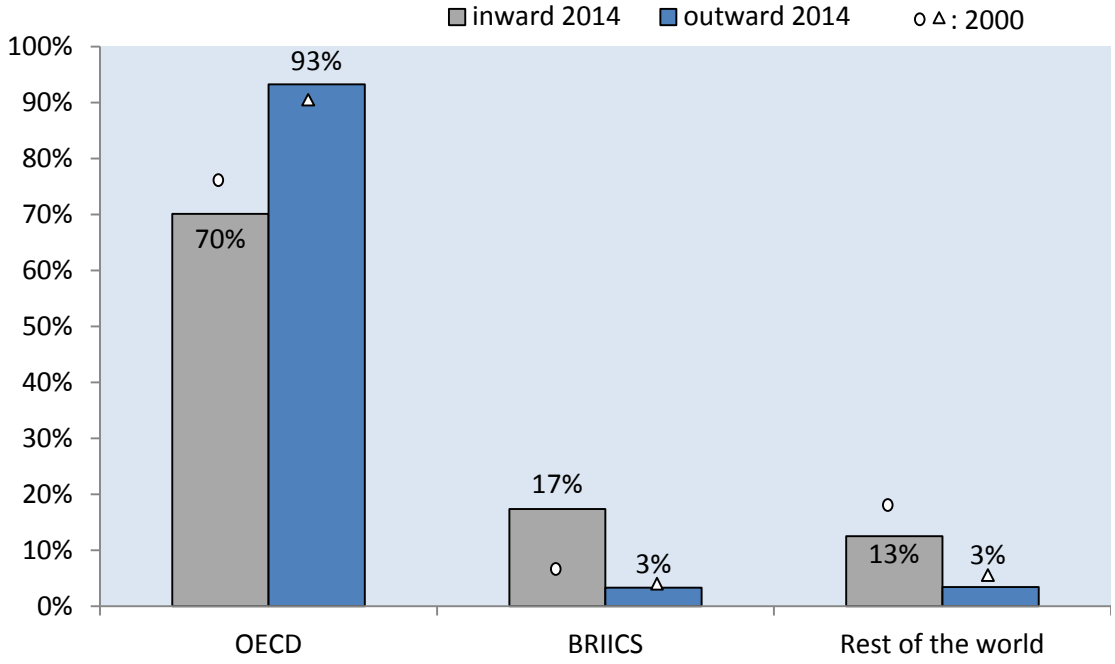
The geographical location of production (host country – inward investment) differs widely from the ownership of production (home country – outward investment) as illustrated when comparing foreign affiliate output according to the location of the activity on the one hand and the nationality of the ultimate owner of the foreign affiliate on the other (Baldwin and Kimura, 1998). OECD countries make up a large part of the world output by foreign affiliates, in terms of inward activities (70 %) and especially in outward activities (93 %).[8] However, the share of OECD countries, both in inward and outward production by foreign affiliates, is slowly declining in favour of the BRIICS economies, whose MNE more than doubled their outward activity from 1 to 3 % in the 2000-14 period (Figure 6). Also (some) countries in the Rest of the World have become more important investors abroad. Overall, these changes reflect the growing globalisation of economic activity and the change in patterns of MNE investment flows.

Figure 5. The share of foreign affiliates in gross output, by region, 2014 and 2000



Note: BRIICS includes Brazil, China, India, Indonesia and Russia.

Figure 6. Share of regions in the global output by foreign affiliates (inward and outward), 2014 and 2000



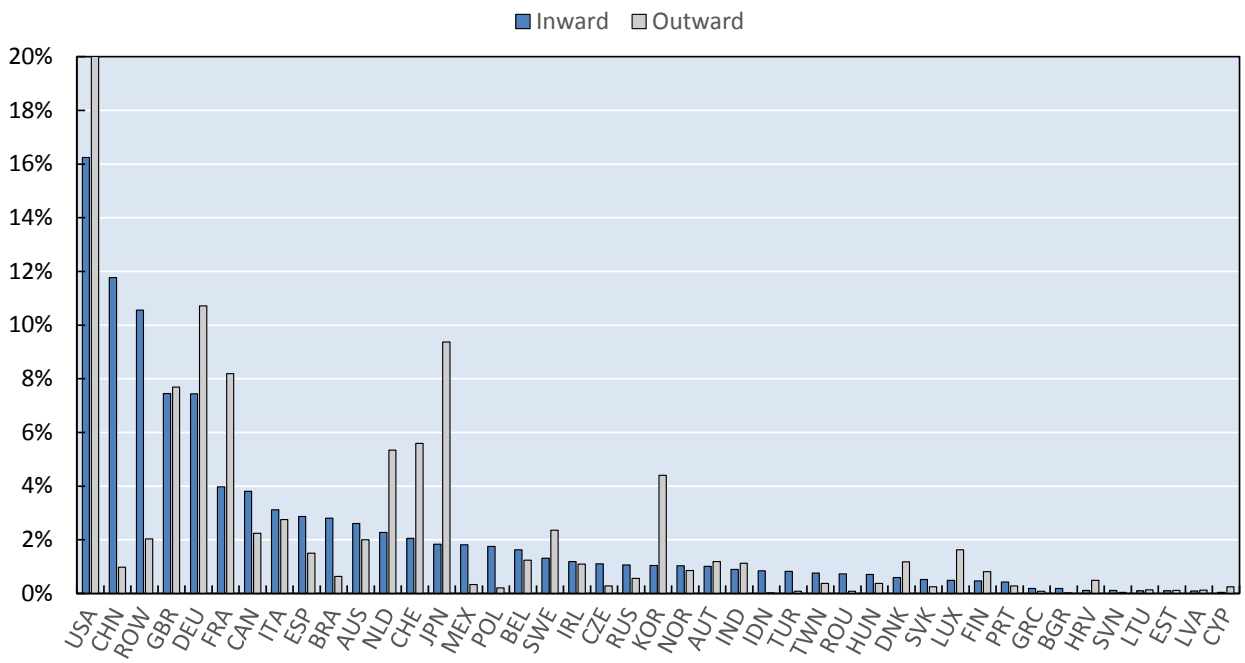
Note: BRIICS includes Brazil, China, India, Indonesia and Russia.

3.4 A country and industry perspective

At the country level, the majority of outward production is controlled by a small group of advanced economies (the United States, Germany, Japan, France, the United Kingdom, Netherlands and Switzerland), controlling almost 70 % of global foreign affiliate production. In particular, US-owned foreign affiliates make up a large portion of output in most countries. Just as on the level of large regions, inward and outward foreign affiliates' activity is significantly asymmetric in a number of countries. For instance, the share of Japanese MNEs in the global output by outward foreign affiliates is four times higher than their share in inward activity. The opposite is true for China, where the share of inward FA activity is 10 times higher. Looking at the inward side, the location of foreign affiliate activity is more in line with the weight of the country size in the global economy, with China and the United States hosting almost 30 % of inward FA production (Figure 7).

Overall, the presence of foreign affiliates has increased in most countries, with the exception of some emerging economies, such as Brazil, India, Indonesia and Russia, and some high-income countries, such as Australia, Canada, Ireland and South Korea. At the country level, the presence of foreign-owned companies can be significant relative to the size of the host economy.

Figure 7. The share of countries in the global output by foreign affiliates (inward and outward), 2014



Note: Note by Turkey

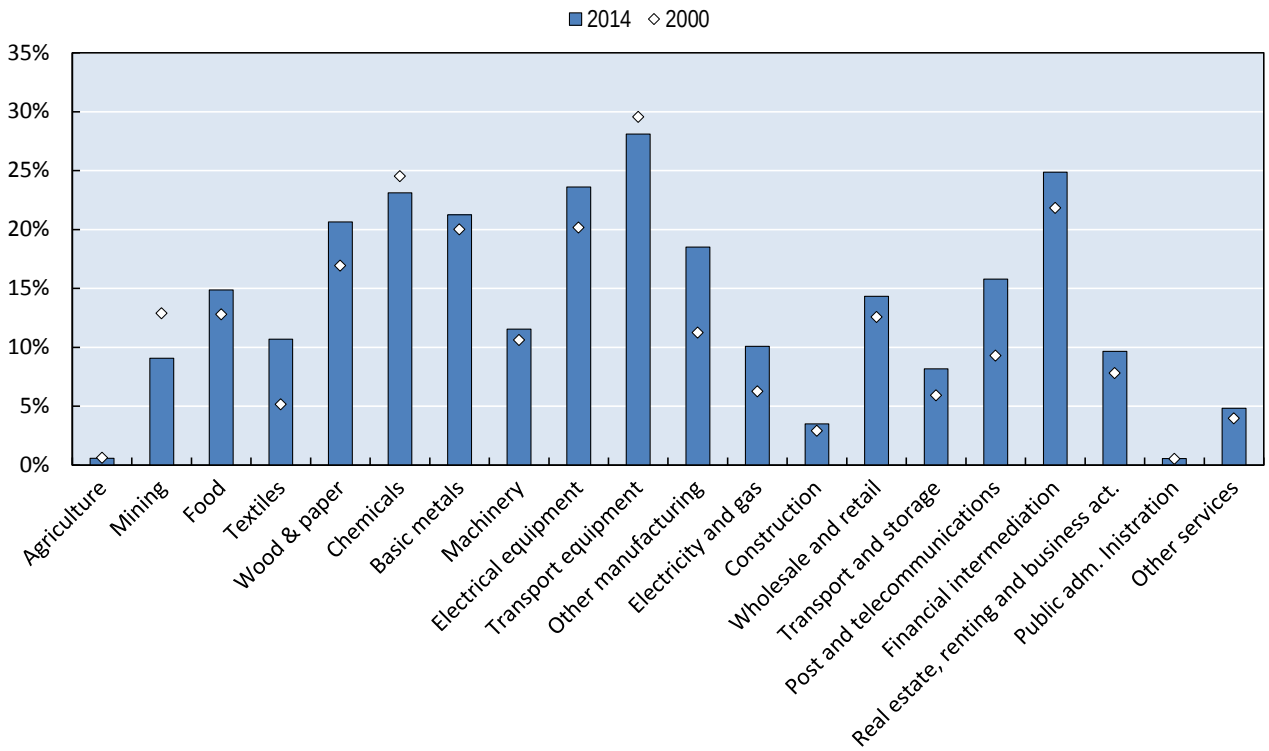
The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

Note by all the European Union Member States of the OECD and the European Union

The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

Not surprisingly, foreign affiliates' production varies not only across (home and host) countries but also by industry (Figure 8). In the primary sector, foreign affiliate activity accounts for less than 1 % in total agricultural output while in "construction", the presence of foreign affiliates is about 3%. On the other hand, the foreign affiliate share in output is high (between 20 and 30 %) in the production of "chemicals", "basic metals", "electrical equipment", "transport equipment" and "financial intermediation". The general trend is that foreign affiliates increased their presence in manufacturing and services sectors, with the exception of "mining and quarrying", "chemicals" and "transport equipment".

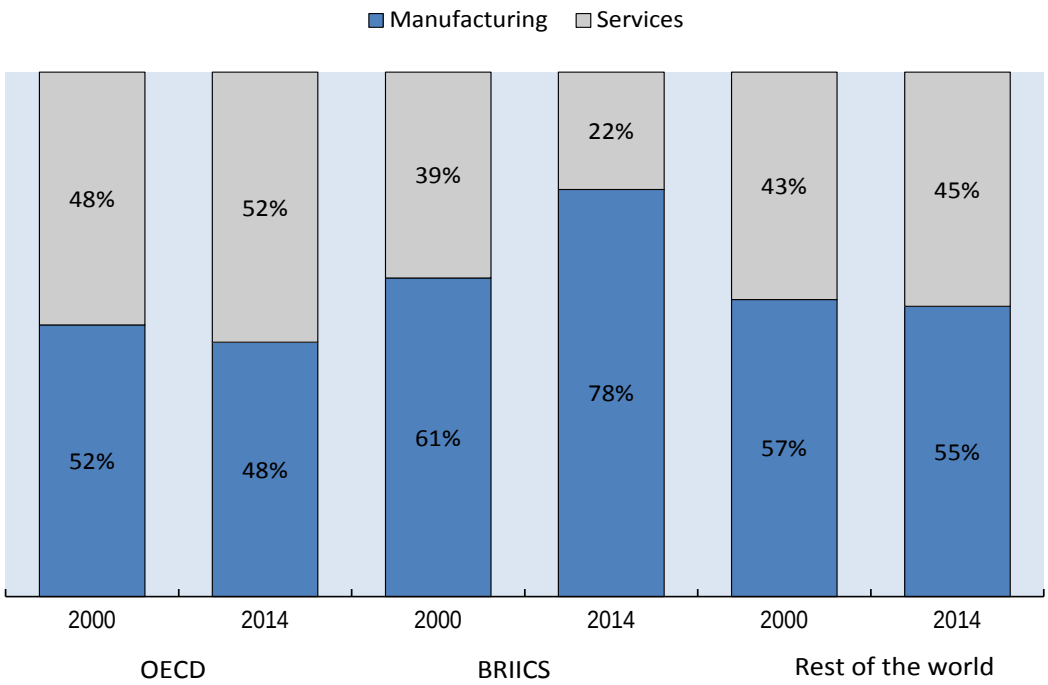
Figure 8. Foreign affiliates' share in global output, by industry, 2014 and 2000



Overall, foreign-owned firms produced one-fifth of goods and 12 % of services in 2014. Foreign affiliates' production in the manufacturing sector showed a substantial drop in 2009 in the depth of the financial crisis but also a quick rebound to its pre-crisis level – in contrast to the services sector where foreign affiliates' output showed a continuous growth pattern although with some slowdown in 2009.

Foreign affiliates in the BRIICS economies are specialised in manufacturing, accounting for one-fifth of global foreign affiliate output in the manufacturing sector (Figure 9). In particular, more than fifty % of foreign affiliate production in "textile and apparel" and "electrical equipment" is located in emerging economies. Looking at the country level, China is the major recipient of foreign affiliates in manufacturing and accounted for 20 % of global output by foreign affiliates in 2014. At the other hand, OECD countries hosted almost 80 % of foreign affiliate activity in the services sector in 2014, of which 50 % is located in the European Union.

Figure 9. Manufacturing and services share in the output by foreign affiliates, by region, 2014 and 2000



Note: BRIICS includes Brazil, China, India, Indonesia and Russia.

3.5 From gross output to value added

About 60 % of the global output by foreign affiliates consists of intermediate goods and services – often sourced from other countries within their MNE network - whose value count only once as a GDP contribution in the original country. In contrast, the value of these intermediates is included in the gross output statistics in different countries. For instance, when a foreign affiliate sources inputs from its headquarters to be incorporated into a final product, the value of the inputs is counted twice: in the output of the home country and of the host country of the affiliate, while only once in the GDP of the home country. Roughly USD 8 trillion of the USD 20 trillion of the global output value of foreign affiliates, was actual value added created by foreign affiliates in the global economy in 2014 (Figure 10).

The share of intermediate consumption in gross output differs significantly between domestic- and foreign-owned firms with these last ones using more intermediate inputs. This reflects the large amount of inputs sourced by foreign affiliates from their multinational group or independent suppliers. Given the high degree of vertical integration of foreign affiliates, gross terms measures such as sales or output are thus not the first-best proxy of foreign affiliate activity. In line with the recent literature on global value chains (Johnson and Noguera, 2012; Koopman, Wang and Wei, 2014; Los, Timmer and de Vries, 2016), looking at the value-added in output of foreign affiliates gives a somewhat different picture.[9] This also explains why the share of foreign affiliates in world GDP is smaller than in global production: 10% versus 12%.[10]

Figure 10. From gross output to value added, foreign- versus domestic-owned companies, 2014

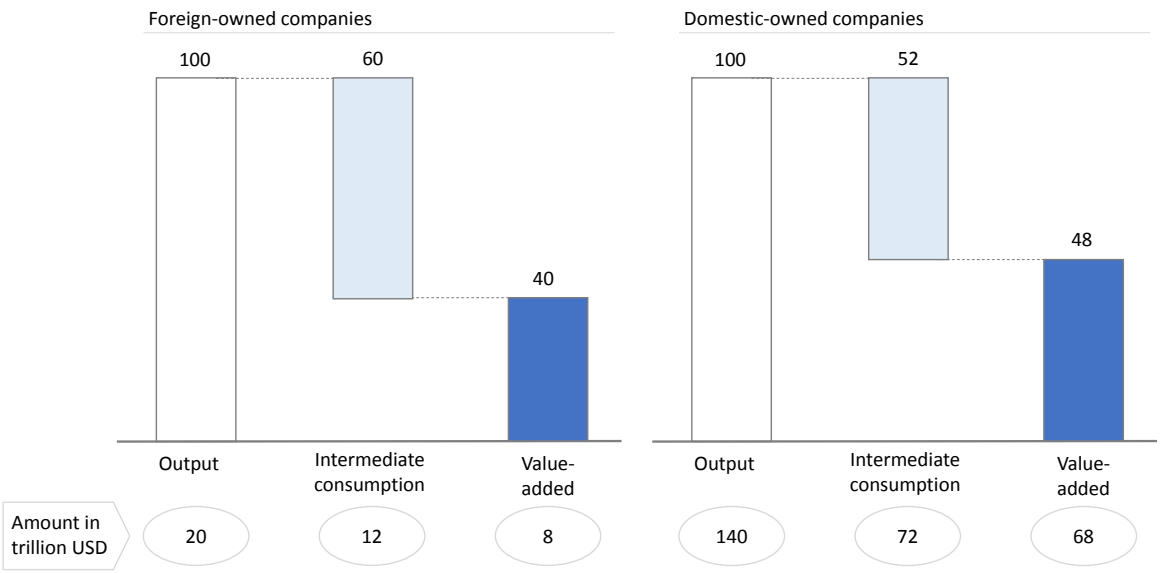
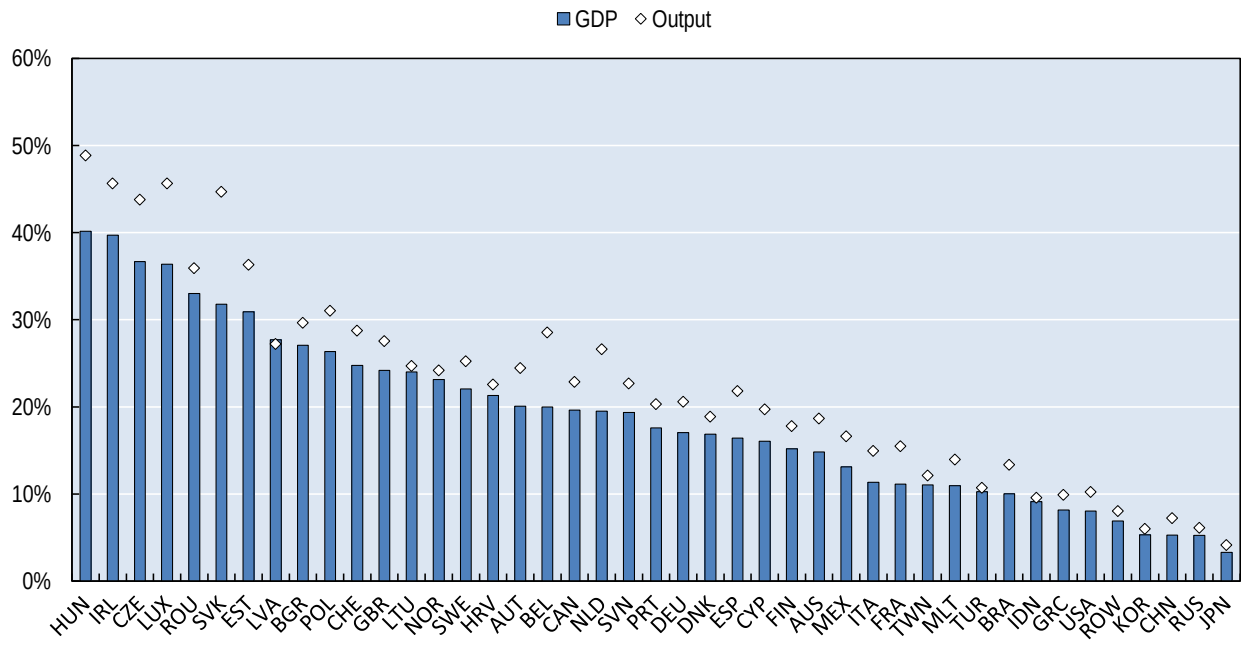


Figure 11. The share of foreign affiliates in GDP and gross output, by country, 2014



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Because of intermediate consumption, gross output statistics may thus systematically overestimate the importance of foreign-owned companies, especially in countries where the presence of foreign affiliates is higher (Figure 11). The largest differences are observed in small open economies which have a large presence of MNEs such as Belgium, the Czech Republic, Estonia, Hungary, Luxembourg and the Slovak Republic.

4. New insights on MNEs' role in GVCs

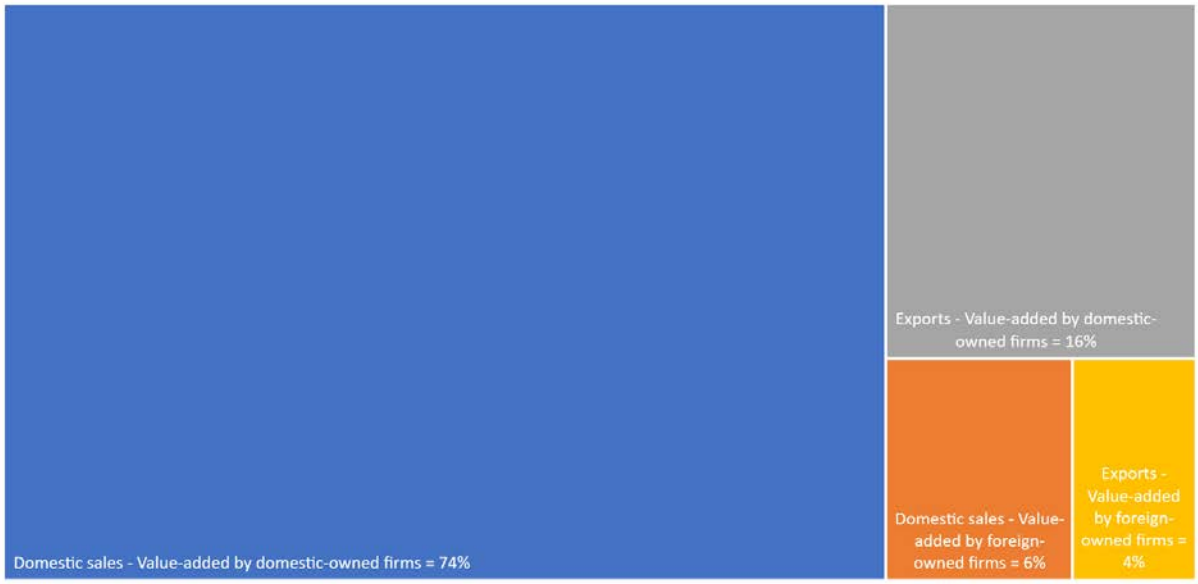
4.1 The relative importance of trade and sales by foreign affiliates at the global level

Just like trade in value-added terms has provided new insights on global trade, analysing the role and importance of foreign affiliates in value added terms provides a number of new insights. Previous reports on MNEs have traditionally focused on gross output and sales and have underlined the importance of foreign affiliates. The analytical AMNE database provides a somewhat different picture of the relative importance of trade and investment in GVCs when looking in value-added terms. This new picture seems to be more in line with the business literature that stresses the importance of third parties in the operations of MNEs, as well as the empirical analysis looking at firm-level data and theories on global sourcing. For example, the model developed by Antràs and Helpman (2004) suggests that only the most productive firms engage in both trade and FDI, while less productive firms only export or only serve the domestic market.

A number of different calculations and indicators based on the analytical AMNE database allows us to better understand the trade-investment nexus in GVCs and the business strategies MNEs use in GVCs. First, Figure 12 provides a full decomposition of world GDP indicating whether value-added is derived from domestic sales or from exports and then whether this value-added is generated by domestic-owned firms or foreign-owned firms. It shows first that more value-added is created through trade than through the sales of foreign affiliates. The value-added in exports by domestic-owned firms and foreign-owned firms (16%+4%=20%) is considerably larger than the value-added in domestic sales by foreign-owned firms (6%). The overlap between trade and investment is relatively small – i.e. 4% of world GDP - which corresponds to the value added in exports by foreign-owned firms. This figure of 4% seems to suggest that at the world level foreign affiliates account for a rather small share of trade in value added terms, an indication that GVCs operate with many arm's length trade transactions and maybe less within pure MNE networks (e.g. inputs transferred between affiliates).[11]

Second, Figure 12 also highlights that 74% of world GDP is value-added created by domestic-owned firms in domestic sales. For most products and particularly for services, a high share of value-added is domestic. And even when products are imported, trade margins create domestic value added if the wholesaler and retailer are domestic firms (and possibly domestic-owned). But MNEs can and do still play a role in this domestic value that was added by domestic-owned firms. First, there are domestic MNEs and their operations also create domestic value-added. Second, with the analysis in value-added terms, the origin of value-added is identified, independently of how it has further transited through foreign firms. For example, domestic inputs can be used by foreign firms, exported and then come back embodied in intermediate imports that are then incorporated in domestic sales by domestic-owned companies. These inputs are also contributing in this case to the domestic value-added in domestic sales. Figure 12 should therefore not be interpreted as the share of GDP under the control of MNEs. More evidence on this will be provided below.

Figure 12. Decomposition of world GDP, 2014



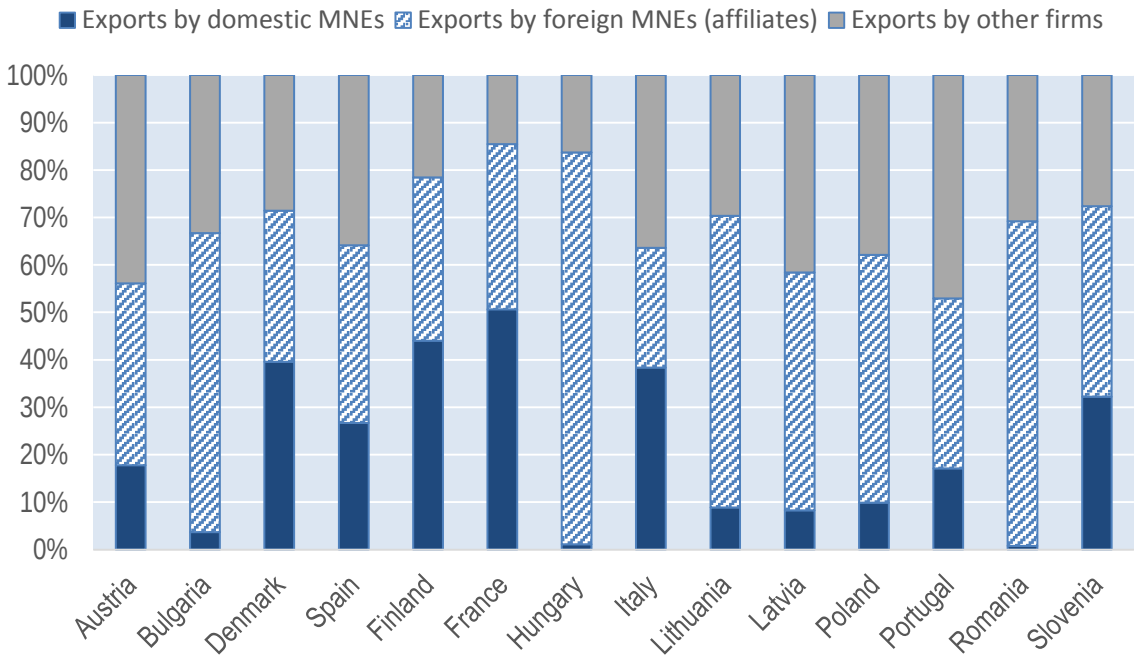
4.2 The share of MNEs in world trade

There is a general perception that a large share of world trade takes place within MNE networks which seems to go back to UNCTAD's estimate that "80% of global trade is coordinated by MNEs" (UNCTAD, 2013). This very high estimate was obtained by adding MNEs' arm-length trade (i.e. trade between MNEs and final consumers or non-MNE firms), intra-firm trade (i.e. trade within MNEs between affiliates or with the parent company) and trade related to 'non-equity modes' of production (i.e. trade between companies that have no ownership link but are associated through contract manufacturing, franchising, licensing or other forms of contractual relationships).

The data in Figure 12 only refer to exports by foreign affiliates, but as mentioned earlier in this document, MNEs include activities of foreign affiliates abroad as well as headquarters (and plants in the home country of the MNE). The problem is that data on the 'domestic' part of MNEs are only available for a limited number of countries; Figure 13 provides estimates for those countries for which the data is available on the composition of gross exports by type of firm (domestic non-MNE, domestic MNE and foreign affiliate). Gross exports of MNEs correspond to both arm's length transactions and intra-firm trade (something that cannot be distinguished in our data).

The results show that a large variation exists across countries. For countries like France or Hungary, more than 80% of exports are by MNEs, mainly foreign MNEs in the case of Hungary while domestic MNEs play a more important role in France. For Austria or Portugal, exports by MNEs are below 60%. It is expected that EU countries show relatively higher shares reflecting the strong economic integration within the EU - companies from other EU countries are part of the "foreign MNEs" in the chart. Based on this, an estimate of the global share of MNEs in international trade can be derived out of the analytical AMNE database: MNEs were in 2014 responsible for 50% of world exports with about 19% by domestic MNEs (headquarters and domestic plants in the home country) and 31%by foreign affiliates abroad.

Figure 13. Gross exports decomposition, latest year available



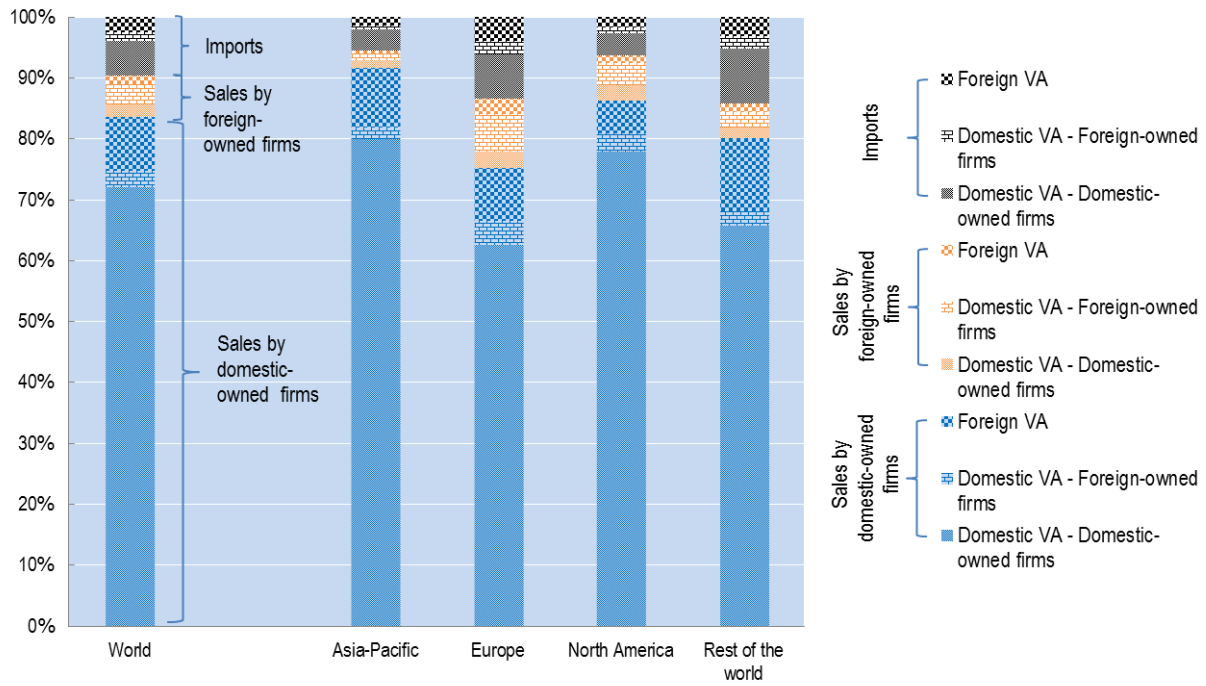
4.3 Activities of MNEs in final demand by region and for specific GVCs

The final demand in each region can be decomposed according to the type of firm selling the products consumed. Figure 14 shows for the world and for four regions the allocation of final sales between domestic-owned firms, foreign-owned firms and foreign firms (i.e. imported products). These three categories are further decomposed on a value-added basis to identify the origin of value-added (domestic-owned firms, foreign-owned firms and foreign value-added). In this last decomposition, the value-added by domestic owned-firms and foreign-owned firms combines to domestic value-added (i.e. the remuneration of domestic factors of production) while foreign value added is the value that was created abroad (and has remunerated foreign factors of production). In general, imported products consist mainly of foreign value added although there is also some domestic value-added when production relied on domestic inputs imported by the exporter.

Aggregating across all sectors (including all services industries), most of the sales are made by domestic-owned firms (84%) and reflect domestic-owned firms value-added. Imported products account for 10% of final demand while the sales of foreign affiliates only account for 6% of total sales. Foreign-owned firms mostly rely on their own value-added or the value-added by other domestic firms – i.e. both domestic value-added - rather than on imported value-added. Important differences exist across regions with Europe relying more on imports and sales by foreign-owned firms. The rest of the world (which in this case includes BRIICS, with the exception of China) has a similar share of imports but as compared to the EU a much smaller share of sales by foreign-owned firms. In the Asia-Pacific region and in North America, more than 85% of sales are by domestic-owned firms.

Taken together, the results demonstrate the complex business strategies of MNEs going beyond the 'old' distinction between horizontal and vertical activities. For example, export strategies are found to be larger than pure strategies of horizontal FDI in trying to get access to foreign markets. In addition, the final sales of foreign affiliates do not rely heavily on imported inputs, which qualify the strategy of vertical investment.

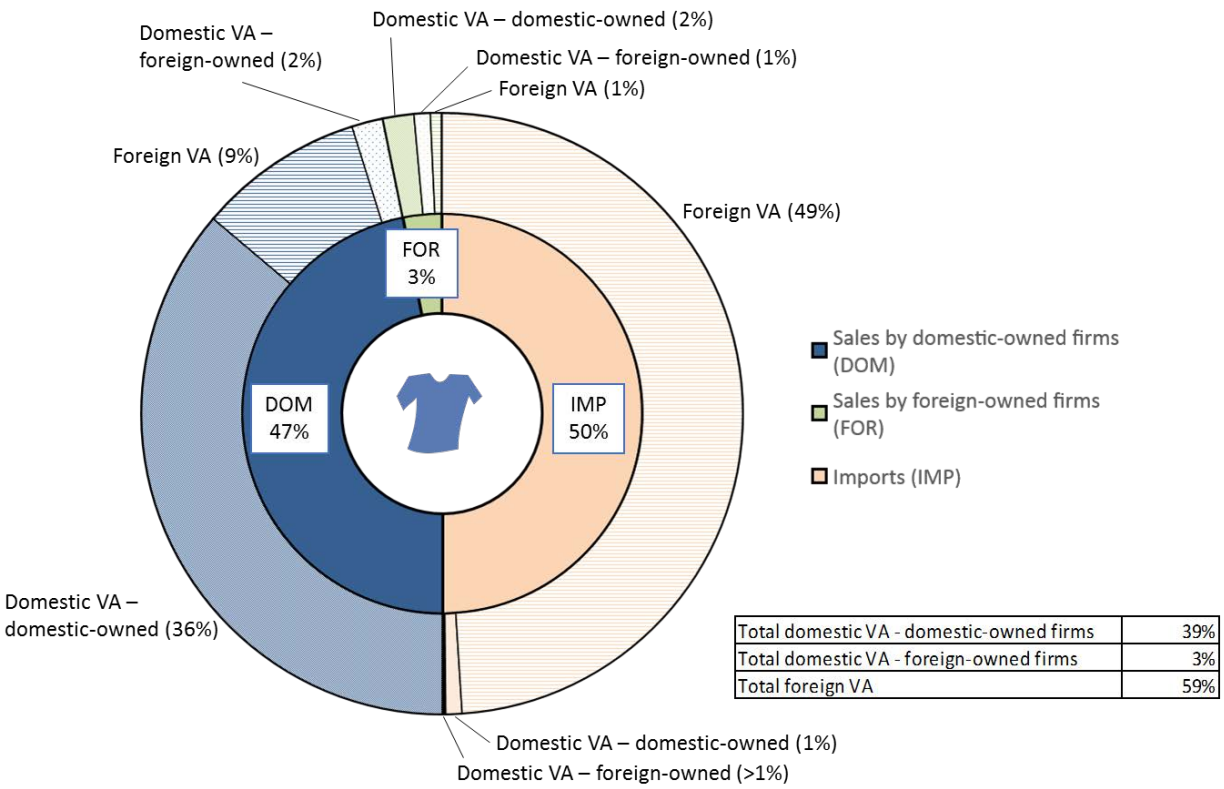
Figure 14. Decomposition of final demand, all sectors, by region, 2014



The analysis becomes more revealing when looking at specific value chains, such as the textile industry (Fig. 15) and motor vehicles industry (Fig. 16). The same legend as in Figure 14 is used but this time with a "sunburst chart". In the case of the textile industry, sales by foreign-owned firms are almost non-existent. The products that are not sold by domestic-owned firms are imported from abroad. Moreover, in terms of value-added, both the sales of domestic-owned firms and imported products rely on domestic-owned firms (in their respective countries). But in both cases, there is nonetheless a contribution of foreign-owned firms as suppliers of inputs.

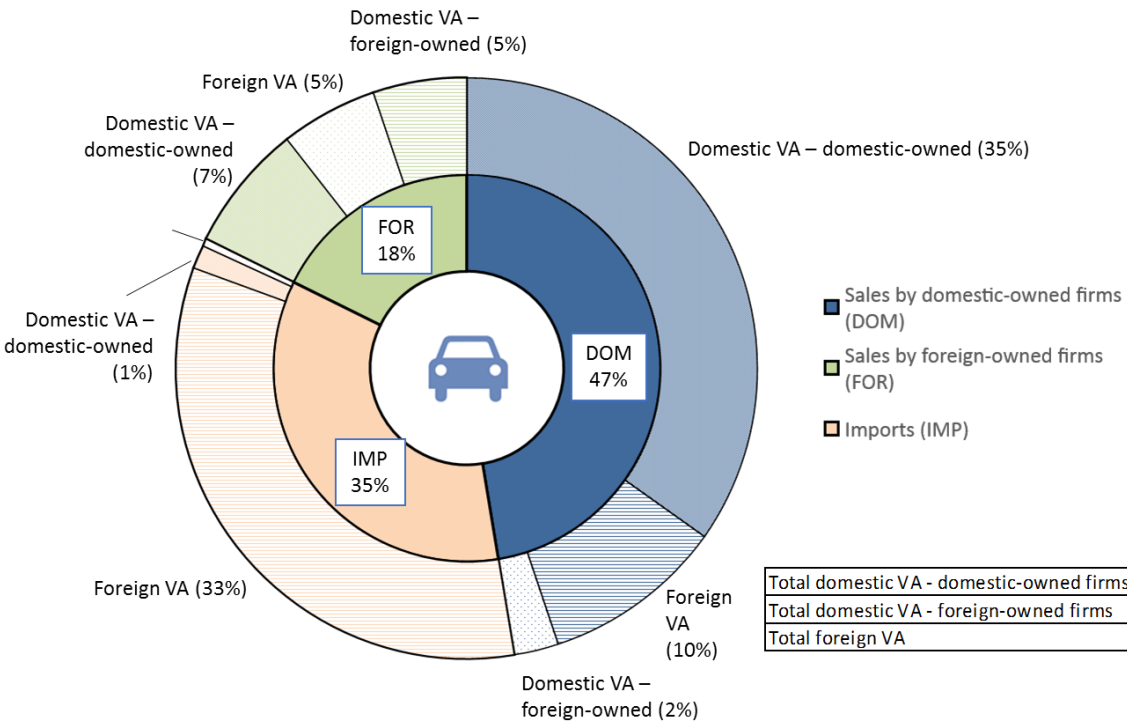
The profile is different in the motor vehicles industry on Figure 16. Sales by foreign affiliates represent a higher share of total sales. On the one hand, cars are costlier to trade cross-border and heavy mechanical parts are more easily assembled near consumers. On the other hand, there are several types of policies encouraging local production in the automotive industry. Interestingly, imported cars rely more on inputs provided by foreign-owned firms and on imported inputs as compared to cars sold by domestic-owned companies. It suggests another type of production closer to consumers (in the same region) but through export platforms.

Figure 15. Decomposition of final demand, textile industry, 2014



Total domestic VA - domestic-owned firms	39%
Total domestic VA - foreign-owned firms	3%
Total foreign VA	59%

Figure 16. Decomposition of final demand, motor vehicles industry, 2014



Total domestic VA - domestic-owned firms	43%
Total domestic VA - foreign-owned firms	8%
Total foreign VA	49%

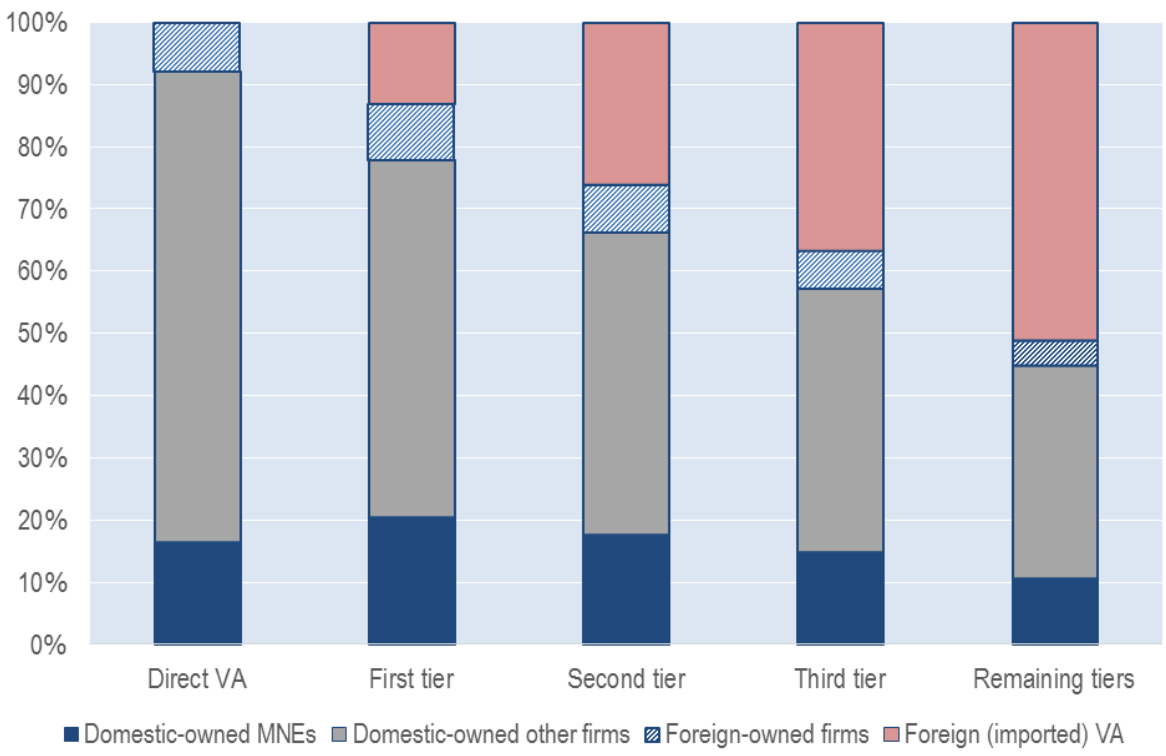
4.4 Activities of MNEs upstream in the value chain

Another interesting insight from the analytical AMNE database is presented in Figure 17, which looks at where and by whom value is created along the different stages of production when moving upstream in the value chain.

On the left of the chart is the direct value-added, i.e. the value-added provided by the domestic firms selling the product. The direct value-added is further decomposed into value-added by domestic-owned firms and foreign-owned firms depending on which type of firm has sold the product. Then moving to the right shows the value added by the first tier of suppliers of inputs (Tier 1). This value can be added by domestic-owned or foreign-owned firms but also by foreign firms (i.e. imported inputs). To produce these inputs, other inputs are needed upstream (Tier 2) and so on, revealing who is adding value along the value chain. In all industries, the same pattern is observed. The more upstream we look at the value chain, the more prevalent is foreign (imported) value-added. Foreign-owned firms play either a role in the direct value-added or in the more directly upstream industries. The share of value added from foreign-owned firms goes down when moving more upstream.

This evidence further confirms that MNEs are not fully vertically integrated structures that would organise the supply of inputs all along the value chain. The foreign affiliates are either directly involved in final sales or in activities immediately before the final stage of production, consistent with their role of supporting activities in specific business functions.

Figure 17. Decomposition of value-added by production stage, selected industries, 2014

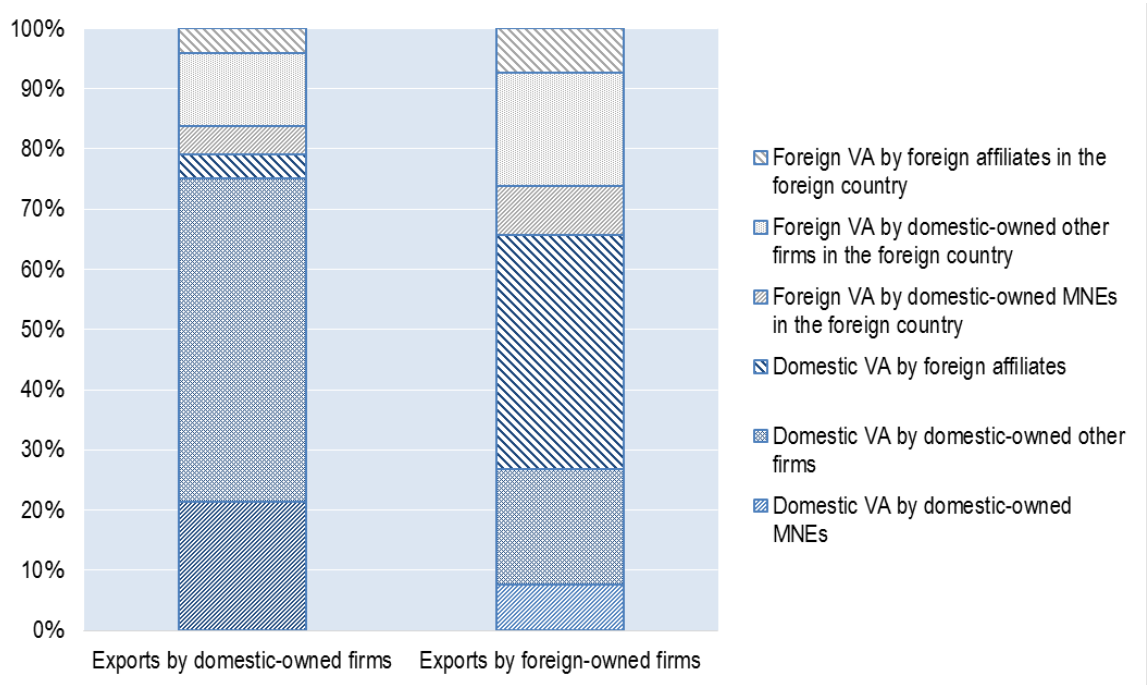


4.5 A closer look at exports of foreign affiliates

Lastly, the question is to what extent exports of foreign affiliates are different from exports of domestic-owned firms. Figure 18 provides additional evidence on the nexus between trade and investment by decomposing manufacturing exports (for the world). Gross exports are decomposed into domestic value-added (the remuneration of domestic factors of production) and foreign value-added (the remuneration of foreign factors of production through imports of intermediate products used in exports). Then, the value-added is further decomposed according to the type of firm where this value was generated in the domestic economy (for the domestic VA) or abroad (for the foreign VA): a domestic-owned MNE, a domestic-owned company which is not an MNE ('other domestic-owned firms') or a foreign-owned firm (i.e. a foreign affiliate). When decomposing the foreign value-added, the 'domestic-owned MNE' refers to a MNE in the foreign economy.

Figure 18 highlights that for manufacturing exports there is an important difference between domestic-owned and foreign-owned firms. The value-added structure of their exports is different. As expected, foreign-owned firms use a higher share of foreign (imported) inputs in their exports (34% as opposed to 21% for domestic-owned firms). But there is also a difference when it comes to domestic value-added (i.e. the use of domestic inputs) as foreign-owned firms produce exports with a high share of inputs coming from other foreign affiliates in the domestic economy (39%). It suggests that within the host economy, foreign affiliates rely on their own network of suppliers that are also foreign-owned. But foreign affiliates also rely on domestic-owned suppliers as well for a share which is also quite high (26% when adding domestic MNEs and other domestic-owned suppliers of inputs). This result highlights that foreign affiliates create a significant amount of value in host countries.

Figure 18. Decomposition of manufacturing exports by domestic-owned firms and foreign-owned firms



Looking this time at the decomposition of foreign value-added, another very interesting result is that the foreign affiliates rely mostly on inputs provided by non-MNEs (in the foreign country). This category excludes any intra-firm trade. If there is intra-firm trade, it is captured on Figure 18 as part of the foreign VA supplied by MNEs in the foreign country but without any possibility in the data to distinguish the

parent MNE of the affiliate from other MNEs. The relatively high share of foreign VA coming from non-MNEs (and therefore not intra-firm) confirms that few MNEs follow the 'pure model' of vertical FDI and vertical integration where a final product is produced by inputs successively added and transformed within the boundaries of the same MNE. Figure 18 is consistent with firm-level analysis putting the emphasis on arm's length trade and the role of third-parties in the operations of MNEs (Ramondo et al., 2015).

5. Concluding remarks and policy implications

This paper has presented the first results of a large exercise to account more directly for the activities of MNEs into the GVC reality, stemming from the general perception that MNEs are actually driving GVCs. While this is still largely work-in-progress, a number of important observations emerge from the first analyses:

- MNEs occupy an important role in the global economy of today, roughly accounting for one-third of global output and half of global exports.

- Trade still seems to be the preferred entry mode to serve foreign markets with trade larger than sales by foreign affiliates.

- Foreign affiliates in host countries occupy different roles, which cannot be described in terms of (pure) horizontal and/or vertical activities. Not all MNE affiliates are part of the (physical) supply chain of MNEs by providing inputs or selling products. Instead, they play an important role when it comes to value creation at the firm level (by providing supporting services, knowledge creation, etc.).

- MNEs have many ways to access foreign markets; in addition to trade and local sales by affiliates, they increasingly also use other modes such as franchising, licensing and other forms of partnerships.

- Foreign affiliates create a considerable amount of value in host countries which is used for the remuneration of domestic production factors; in addition, foreign affiliates are also found to source inputs and services from domestic suppliers.

Just like the development of TIVA statistics has changed our understanding of trade and challenged existing trade policies, the new data presented in this report suggest that the MNE role in GVCs goes beyond trade and investment policy. A broader set of policies has to be revisited in light of new insights on how MNEs are organised and the role played by foreign affiliates in global production.

While often described as “two sides of the same coin”, trade and investment seem to be intertwined in a more complex manner within GVCs. MNEs are best described as networks within networks. A network of affiliates serving different purposes within the MNE, inserted in a broader production network described as the “global value chain”. Previous policy implications with respect to the complementarity between trade and investment remain relevant, but have to be extended to other forms of market access such as franchising, licensing and other forms of partnerships. Instead of promoting exclusively trade or investment, policy should try to provide the best environment for the right foreign market entry decisions.

To be effective such policies should be comprehensive in terms of addressing all the potential relevant policy areas, thus not only trade and investment, but also the movement of people, contractual relationships, intellectual property, etc. They should also seek some kind of neutrality between firm types and the strategies that they adopt in order for the decisions of firms to be based on economic efficiency rather than regulatory distortions. The fact that foreign affiliates in MNEs serve a variety of purposes and belong to different industries upstream or downstream suggests that market access in ‘related’ industries might be as important as market access in the products in which firms are specialised.

There is still a need for adequate investment policy but it should be kept in mind that equity-based modes of foreign market entry are not the only available option. Looking at MNEs only through an investment policy angle abstracts from the complex structures of MNEs. Investment is not the variable that

should be primarily used by policymakers to assess the outcome of their policies; instead, successful strategies should focus on job creation value added by foreign activities of firms and how this value-added relates to the inputs used to generate it (i.e. productivity).

Beyond market access, policies related to access to capital, skills, R&D incentives, intellectual property, contract enforcement, movement of people and the simplification of administrative procedures, as well as the development of physical and virtual infrastructure, seem key to facilitate the deployment of affiliates. Again, the diversity of affiliates and the fact that their role goes beyond horizontal and vertical production purposes puts the emphasis on policies facilitating global co-operation rather than just the smooth movement of inputs along the value chain.

In this context, there is no contradiction in promoting MNEs and helping domestic firms including SMEs, because of the linkages between both types of firms. MNEs and domestic firms often rely on each other to build their competitive advantage and start to operate in foreign markets. Focusing exclusively on one type of firm neglects the large ecosystems between MNEs and domestic firms and risks thus to become counterproductive. Furthermore, policy has an important role to play in helping (domestic) firms to access foreign markets and internationalise their activities. Digitalisation is argued to lower some of the barriers of firm internationalisation, as the growing emergence of so-called born-global firms seems to demonstrate.

Finally, the evidence gathered in this report suggests that developing countries are not yet fully integrated in MNEs as much as they are in global trade. Specific policies might be necessary to address the specific challenges they face. Accession to WTO and global rules on trade have played an important role for some emerging economies to increase their participation in GVCs. The fact that global rules are less developed in other areas and particularly for investment might be a factor explaining the relatively lower involvement of these countries in MNEs.

NOTES

1 While multiple definitions of MNE have been used in economic and statistical research, central in these definitions is that MNEs organise and coordinate multiple value-adding activities across national boundaries by internalising the cross-border markets for the intermediate products accompanying these activities.

2 A first methodology was developed in 2014 thereby offering preliminary estimates based on available data from the OECD AMNE database.

3 Because of their more recent time horizon, WIOD tables instead of TiVA tables have been used in this analysis to guarantee the timeliness of the insights on MNEs in GVCs. Future analysis however will link AMNE data with the OECD ICIO database, allowing for a better geographical coverage.

4 For a review of the literature on the "trade slowdown", see Hoekman (2015).

5 These so-called 'domestic MNEs' are included in the 'domestic part' of the production, value added and export matrices.

6 The production of parent companies is only available for 16 reporting countries from the OECD AMNE database; econometric analysis on a number of variables including the level of development of countries has provided estimates for the remaining countries.

7 This is related to the European single market and the fact that more than in other regions foreign affiliates (when they come from other EU countries) can operate in the same conditions as domestic-owned companies.

8 In general, outward investment is strongly correlated with countries' level of development. Emerging economies and low-income countries have a lower share of outward investment relative to inward FA investment.

9 The methodology used to decompose output and identify the value added by domestic-owned and foreign-owned firms (while taking care of double counting) is explained in Miroudot and Ye (2017).

10 The share of MNEs in world GDP is the same in as in global output (31%) given the higher value added content of production by MNE headquarters (21%) and domestic plants (10%).

11 This 4% does however not account for exports of parent companies to their affiliates (these are included in domestic value added of exports).

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