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Value chain development for deeper integration of East Asia and Latin America

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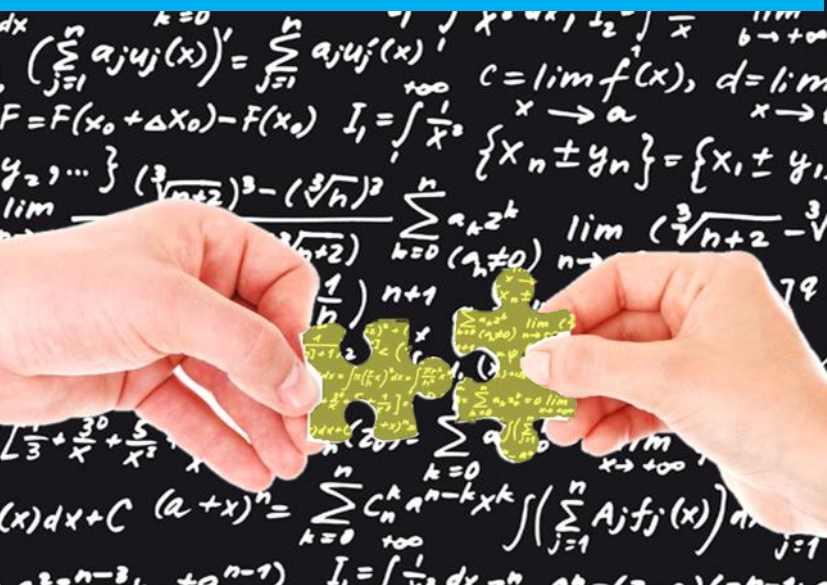
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Value chain development for deeper integration of East Asia and Latin America



Ben Shepherd

ASIA-PACIFIC RESEARCH AND TRAINING NETWORK ON TRADE

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Value chain development for deeper integration of East Asia and Latin America

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Abstract

This paper uses new data from the Asian Development Bank (ADB) and its partners, including the UN Economic Commission for Latin America and the Caribbean (ECLAC), to track the importance of trade within global value chains in East Asia and Latin America. The analysis shows that while value chain trade is important within the overall trade landscape, it takes place to a significant extent within a traditional paradigm in which Latin America most often supplies raw materials, and East Asia supplies manufactured goods. The pattern is not uniform, but there are important elements of this dynamic at play. While experiences differ significantly across countries and sectors, there is a generally a closer degree of GVC integration between East and South-East Asia than between East Asia and Latin America. Nonetheless, GVC integration between Latin America and South-East Asia in agriculture, mining and service sectors shows promise, with the former supplying inputs used in the latter's export production. Trade costs are likely an important part of the explanation, so further attention to policies like regulatory cooperation in services sectors, as well as trade facilitation, and standards and conformance, would be ways to help promote further integration even in the absence of a comprehensive and broad-based liberalization agreement.

Keywords: International trade; Trade policy; Global value chains; Trade costs, Value added exports, Asia; Latin America

JEL Codes: F13; F15; O24

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List of abbreviations

| | |
|------------|---|
| ADB | Asia Development Bank |
| APEC | Asia-Pacific Economic Cooperation |
| ARTNeT | Asia-Pacific Research and Training Network on Trade |
| CPTPP | Comprehensive and Progressive Agreement for Trans-Pacific Partnership |
| DVA | Domestic Value Added |
| DVA_INTrex | Domestic value added in exports, used by the importer for further export production |
| ECLAC | United Nations Economic Commission for Latin America and the Caribbean |
| ESCAP | United Nations Economic Social Commission for Asia and the Pacific |
| FEALAC | Forum of East Asia-Latin America Cooperation |
| FTAAP | Free Trade Area of the Asia-Pacific |
| FVA | Foreign Value Added |
| GVCs | Global Value Chains |
| ITC | International Trade Centre |
| MRIO | Multi-Region Input-Output table |
| PDC | Pure Double Counting |
| RCEP | Regional Comprehensive Economic Partnership |
| UNCTAD | United Nations Conference on Trade and Development |
| WTO | World Trade Organization |

1. Introduction

Analysis of Global Value Chains (GVCs) has grown markedly in academic and policy circles alike over the last ten years or so. Asia is the home of this development, with what are now called GVCs first identified as “production networks” in East and South-East Asia in sectors like automobiles and electronics (Ando and Kimura, 2005). Increasingly, however, it is the extra-regional nature of GVCs that is coming to the fore. ITC (2017) shows that although most GVCs have a distinctly regional character, there is also increasing evidence of linkages across regions, which generate genuinely global value chains.

A value chain “describes the full range of activities that firms and workers do to bring a product/good or service from its conception to its end use and beyond. This includes activities such as design, production, marketing, distribution, and support to the final consumer”.² By extension, a GVC arises when this set of activities is split across multiple countries. GVCs are therefore characterized by narrow patterns of specialization at a country level, accompanied by frequent movements of intermediate goods and services across borders during production.

What are the implications of GVCs from a development perspective? Baldwin (2011) puts forward a new model of industrialization and development based on value chain trade. Whereas countries like Republic of Korea industrialized by developing full supply chains in particular sectors, those countries currently undergoing rapid industrialization, like Viet Nam, are specializing in more narrowly defined tasks according to their comparative advantage, while other productive activities take place elsewhere through GVC linkages. Over time, as labour markets tighten and human capital builds up, countries can move up to higher value added activities within value chains. This process is expressed as increasing labour productivity over time, combined with more intense trade in intermediate goods and services, mostly taking place within value chains.

Recent developments in the international trade literature make it possible for analysts to describe some of these developments in detail. Traditional trade data do not

² <https://globalvaluechains.org/concept-tools>.

adequately describe trade flows within GVCs, in essence because they are recorded on a gross value rather than value added basis. As such, they do not correspond to the major economic aggregates recorded in the national accounts, which use value added as the relevant accounting concept. Intuitively, the difference between these two approaches is relevant when there is intensive trade in intermediate goods and services, which is effectively double counted in the statistics: when they are independently traded, and when they are traded again embodied in higher processing stages within value chains. Netting out the role of backward and forward movements of intermediates is a complex exercise that is demanding both in terms of methodology, and the types of data and processing that are required.

As such, the descriptive analysis of GVCs has tended to focus on countries and regions where data are well-developed, particularly the high-income countries of Europe, North America, and some parts of Asia. However, ADB has assembled the necessary data to better understand GVC linkages within a broader set of Asian countries, and has collaborated with ECLAC to expand coverage to selected Latin American countries. Thanks to work with partners, the ADB multi-region input-output table (MRIO), which is the basis for analyzing GVC trade, now covers 73 countries and 35 sectors. ADB has used current best practice (Wang et al., 2013) to decompose bilateral trade flows within the dataset into 16 elements that can be rearranged and reorganized to provide intuitively straightforward descriptions of different dimensions of value chain trade.

This paper uses the ADB data and decomposition to examine GVC integration between East Asia and Latin America. Given that there is an international instance, FEALAC, which brings the two regions together, I endeavor to cover as many FEALAC countries as possible, given availability of data in the ADB MRIO. Concretely, the analysis covers 26 countries plus an aggregate “rest of Latin America” region, compared with FEALAC’s membership of 32. To facilitate the analysis, I further sub-divide the groups by sub-region, namely East Asia, South-East Asia, Latin America, and Australia. Table 1 shows the mapping of countries to regions.

Table 1. Mapping of countries to subregions

| Country | Subregion |
|--------------------------------------|-----------|
| Argentina | LAC |
| Australia | Aust. |
| Bolivia | LAC |
| Brazil | LAC |
| Brunei Darussalam | S.E. Asia |
| Cambodia | S.E. Asia |
| Chile | LAC |
| Colombia | LAC |
| Ecuador | LAC |
| Hong Kong, China | E. Asia |
| Indonesia | S.E. Asia |
| Japan | E. Asia |
| Lao People's Democratic Republic | S.E. Asia |
| Malaysia | S.E. Asia |
| Mexico | LAC |
| Paraguay | LAC |
| China | E. Asia |
| Peru | LAC |
| Philippines | S.E. Asia |
| Republic of Korea | E. Asia |
| Rest of the Latin American Countries | LAC |
| Singapore | S.E. Asia |
| Taiwan Province of China | E. Asia |
| Thailand | S.E. Asia |
| Uruguay | LAC |
| Venezuela | LAC |
| Viet Nam | S.E. Asia |

Source: ADB MRIO; and author.

Using ADB's decomposition of bilateral trade flows based on Wang et al. (2013), I map GVC linkages among the various subregions. Concretely, I first look at the proportion of gross trade by pair of subregions that can be considered to be GVC trade, before

looking specifically at the proportion of country pair trade that is accounted for by exports of intermediates that are used in the production of the partner region's exports to third countries. Starting at the aggregate level, I then repeat the analysis at the level of four sector groupings, and individual countries with partner subregions.

Against this background, the paper proceeds as follows. Section 2 presents the methodology, focusing on intuition rather than technical detail. The following section then provides a high-level overview of GVC trade among the various subregions, by considering aggregate trade flows (all goods and services summed together; all countries summed into subregions). Section 4 then moves to a more detailed consideration in which individual sectors and countries are examined in more detail, and results are compared and contrasted. Section 5 concludes and discusses the policy implications of the paper's findings.

2. Methodology

The fragmentation of production across borders that is implied by the GVC business model, and in particular the large-scale flow of intermediate goods and services, means that traditional trade data are inadequate to properly describe the phenomenon, in particular in the case of services. Standard trade data are measured on a gross shipments basis. In other words, a cellular phone with an import value of \$500 is recorded as an import of that value, even though its component parts and embodied services have traveled across borders numerous times during the production process, and have also been counted independently in trade statistics. With fragmented production, gross shipments trade statistics tend to significantly overstate the value of trade, and are incompatible with the system of national accounts, which operates on a value added basis. This is the reason why some countries, like Malaysia, have a trade to GDP ratio in excess of 100%: trade values are measured inclusive of the value of intermediate inputs, but GDP is measured net of intermediate inputs.

A second limitation of standard gross shipments trade data is that they do not identify the sources of value added, whether goods or services, embodied in a final product. But from a GVC standpoint, this question is of great importance, as it enables analysts to map GVCs both geographically and in product (service) space. With this in mind,

applied international trade researchers have developed a variety of techniques to examine the nature and extent of GVCs in goods and services sectors alike. Shepherd (Forthcoming) provides an accessible review of the technical details, but we focus here on intuition and understanding.

As noted in the introduction, gross value trade statistics can be seriously misleading as to the nature and extent of trade when backwards and forwards movements of intermediates are common within production processes. Consider a simple example. Thailand supplies a hard drive worth \$100 to China for use in cell phone production, and Viet Nam provides a screen worth \$20. For the sake of the example, the rest of the inputs come from other countries, and are valued at \$100. China then combines the various inputs, assembles the cell phone, and ships the finished product to Brazil with a customs value of \$300. In this hypothetical example, the value of world trade is \$520. At a bilateral level, China's exports to Brazil are worth \$300, even though Chinese origin value added is only \$80.

The first problem that is apparent is that standard trade data overstate the true level of world trade. Assuming each input was constructed using only value added from the country where it was made, there has in fact only been a total movement of \$300 in value added terms across all countries. Second, traditional trade data track transactions between the input suppliers and China, and between China and Brazil. But this is somewhat unrealistic from a value added standpoint, as a substantial part of the value added in the final product in fact originates elsewhere: the input producers have contributed value to the cell phone that ends up in Brazil, but there is no trace of an economic transaction between those countries and Brazil because origin of the cell phone is ascribed solely to China.

These types of issues are not mere nuances, but can be quantitatively important. For instance, in 2018, Hong Kong, China, recorded a ratio of exports to GDP of 188%, based on data from the World Development Indicators. From a national accounts standpoint, such a figure is impossible, as it implies that the value of goods exported was greater than the value of all production in the economy. The reason is exactly the one just highlighted: exports are valued on a gross shipments and single origin basis, whereas the national accounts are in value added terms. As a result, export values do

not net out intermediate input use, as would be necessary to accurately track value added by origin, rather than customs (shipment) value.

The value added approach to analyzing trade data manipulates the information in a MRIO to decompose trade in gross value terms into various elements of interest from a value added perspective. Current best practice in the form of Wang et al. (2013) identifies 16 elements into which exports can be decomposed, and which are consistent at disaggregated levels. For policy purposes, however, it is useful to group those 16 elements into three aggregates: domestic origin value added (DVA), foreign origin value added (FVA), and pure double counting (PDC). DVA refers to the value added content of gross exports that originates within the exporting country. In the cell phone example given above, it is the \$80 of Chinese value added related to assembly activities. FVA refers to the value added content of gross exports that originates outside the exporting country, namely foreign origin intermediates used in the production of exports. In the cell phone example, it is the \$220 worth of foreign inputs. Finally, PDC captures backwards and forwards movements of intermediates across borders, and which can be counted multiple times in conventional trade data. The example used above does not contain a PDC element. By definition, DVA, FVA, and PDC sum to the value of gross exports. All measures can be computed at an aggregate level (country totals) or disaggregated by exporter-importer country pair and sector.

Tracking these three quantities provides a first picture of the extent of GVC activity in countries, regions, bilateral pairs, or sectors. In comparative terms, higher levels of FVA and PDC as proportions of gross exports³ is consistent with a greater importance of GVC production. The reason is that they capture foreign origin value added embodied in a country's exports, as well as goods and services moving backwards and forwards between countries during production, as part of an internationalized network of production. Conversely, a higher proportion of DVA is consistent with a lesser degree of importance of GVC production, as it indicates that linkages are primarily formed within the domestic economy. Comparing relative proportions across bilateral pairs or

³ I use this convention for simplicity, and because it is applicable without difficulty to the data considered in this paper. In other contexts, notably when gross exports of a sector are zero, it is more appropriate to use value added, as suggested by Wang et al. (2013).

across sectors makes it possible to draw conclusion about the relative prevalence of GVC trade in those contexts.

In addition to this overall picture, I use one element of DVA from Wang et al. (2013), which they term DVA_INTrex, or domestic value added that is sent to the importing country and is then re-exported to third countries. This kind of linkage is a classic element of GVC participation, and so is worth delving into in further detail, particularly at a disaggregated level. I therefore present these data in addition to the basic breakdown into DVA, FVA, and PDC, so that export supply relationships can clearly be seen in the data.

The policy literature on GVCs uses concepts like backward and forward linkages (or participation) to describe these kinds of linkages. This paper avoids that terminology, as it is most easily applicable to the literature before Wang et al. (2013), and as such a strict application of these concepts can lead to inconsistencies at a disaggregated level. However, in behavioral terms, FVA is a measure of backward linkages, in the sense that it measures the use of imported intermediates to produce the exporting country's exports. Similarly, DVA_INTrex measures forward linkages, as it measures the use of the exporting country's exports of intermediate goods to produce the importing country's exports to third countries. The concepts are therefore closely related, although the Wang et al. (2013) approach has superior properties from a technical point of view, which is why it is used here.

3. Big picture: GVC integration in East Asia and Latin America

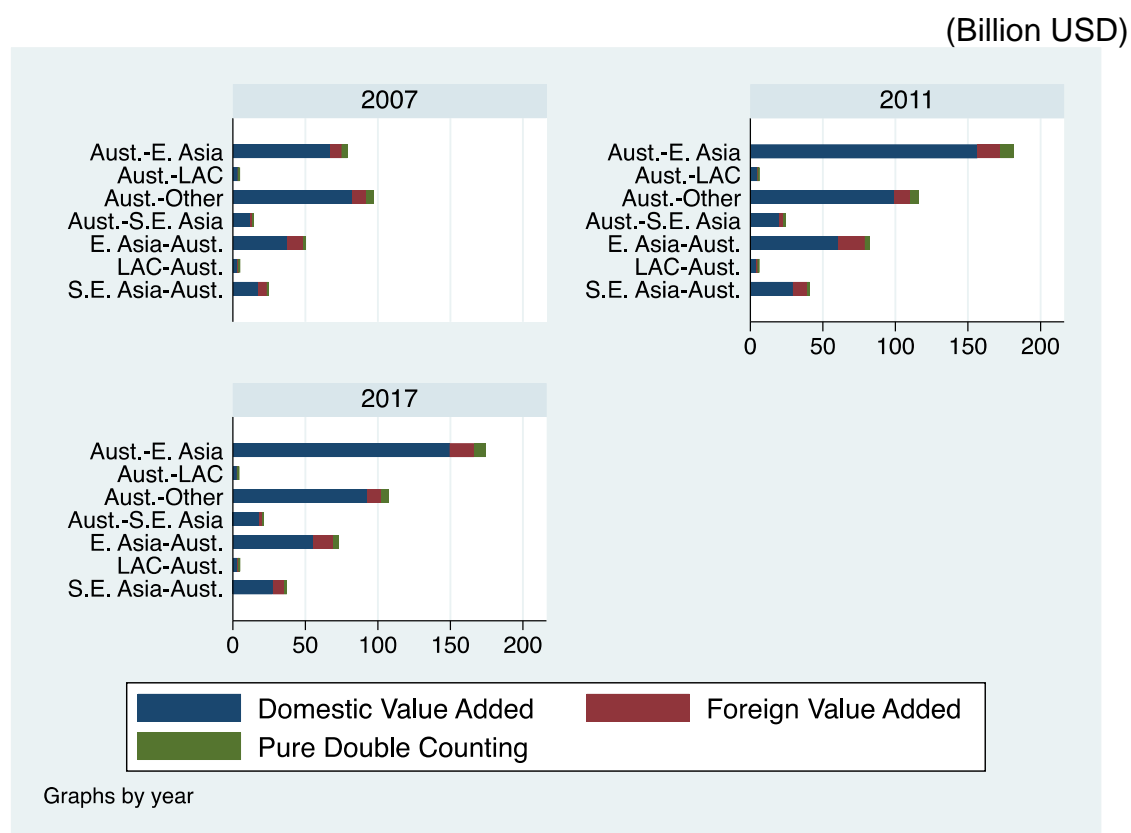
Having set out the methodology in the previous section, this one now moves to apply it to the ADB MRIO, focusing on FEALAC countries. As noted above, for comparative purposes it is useful to subdivide countries further into subregions, so the analysis examines, as appropriate, Australia, East Asia, South-East Asia, Latin America, and Others (grouped together).⁴ In this section, I take a dynamic point of view, considering the data at the three points in time where the ADB MRIO decomposition are available: 2007, 2011, and 2017. The fact that there are significant intervals between the three

⁴ The "others" group primarily consists of North America and Europe.

years is helpful from an analytical point of view, as year-on-year movements are typically small and often related to noise rather than changes in the trends of underlying economic fundamentals.

The first step is to decompose gross exports into the three aggregates: DVA, FVA, and PDC. Figures 1-4 present the data in levels (billion USD), so the height of each bar shows total gross exports for each regional pair across the three years, while the colors show the part of that total that is accounted for by the three value added aggregates. Taking Australia and its partners first (figure 1), there is a clear trend towards concentration of exports on the Australia – East Asia link, and similarly for imports. There is a clear dynamic over time, likely driven by Australia’s increasing reliance on the Chinese market. In absolute terms, links with Latin America are a small part of Australia’s export basket; links with South-East Asia are much stronger, through still considerably smaller than the East Asian link.

Figure 1. The value-added exports between Australia and its FEALAC partners, 2007-2017



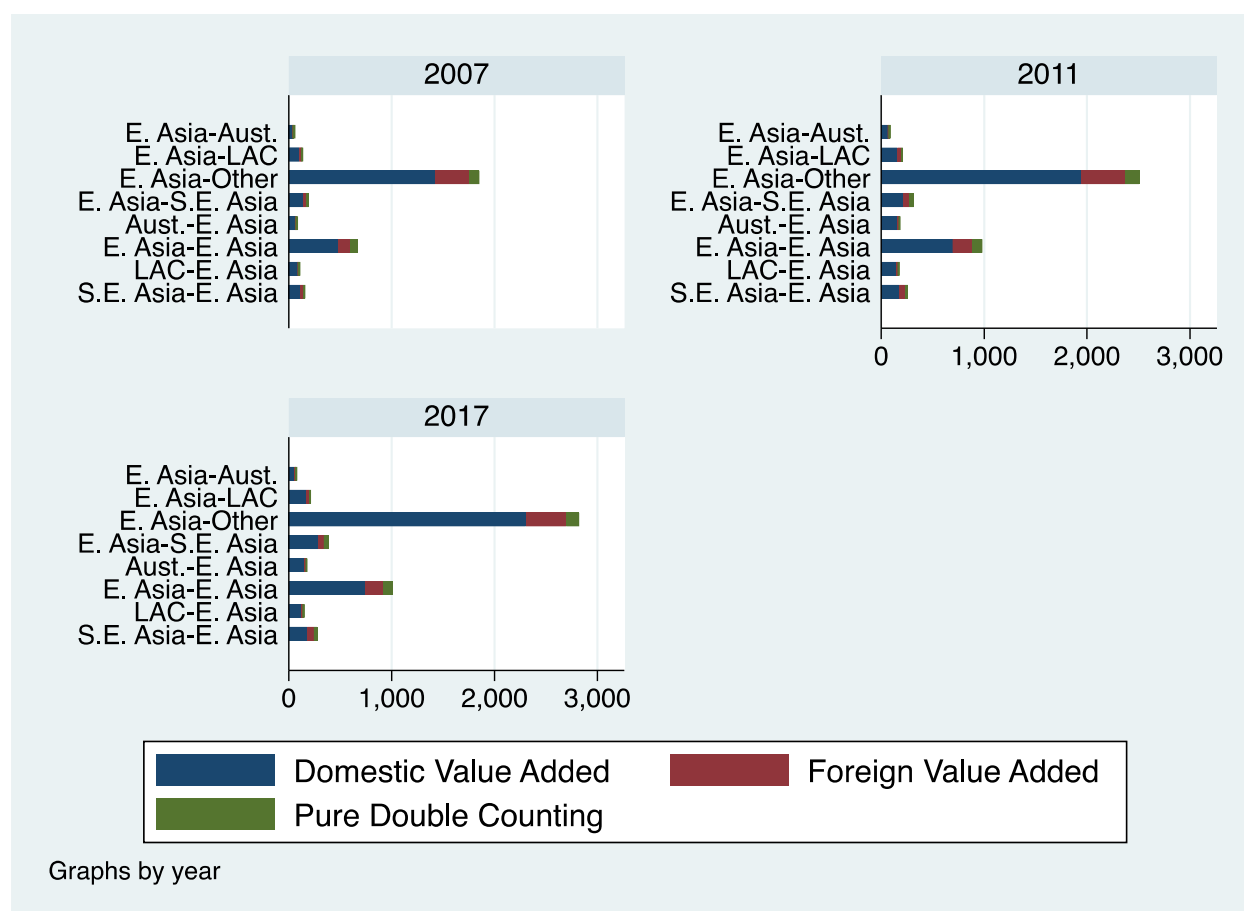
Source: ADB MRIO; and author’s calculations.

Note: In this and all following figures, the first named region is the exporter, and the second named region is the importer.

East Asia (figure 2) shows a different pattern. Intra-regional exports have been growing in importance over time, as have linkages with other countries (those outside the regions considered in this analysis). Linkages with South-East Asia, Latin America, and Australia are much smaller in absolute terms than either of these other trade relationships.

Figure 2. The value-added exports between East Asia and its FEALAC partners, 2007-2017

(Billion USD)

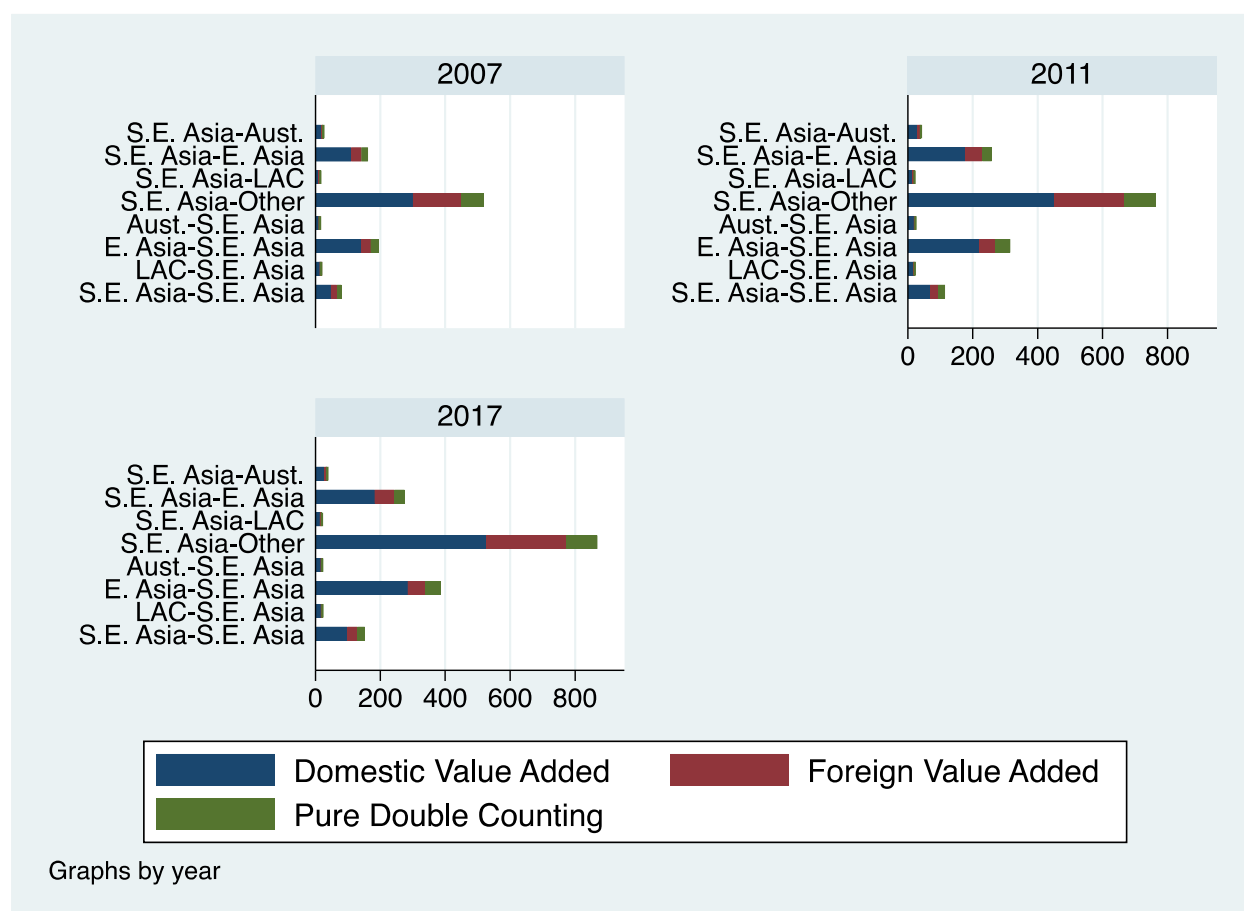


Source: ADB MRIO; and author's calculations.

Figure 3 shows that South-East Asia has important trade relationships with East Asia, the other group, and intra-regionally. Linkages with Latin America and Australia are relatively small compared with these other directions of trade. Over time, it is particularly the connections with East Asia and the other group that are growing, although there is also some development of intra-ASEAN trade as well.

Figure 3. The value-added exports between South-East Asia and its FEALAC partners, 2007-2017

(Billion USD)

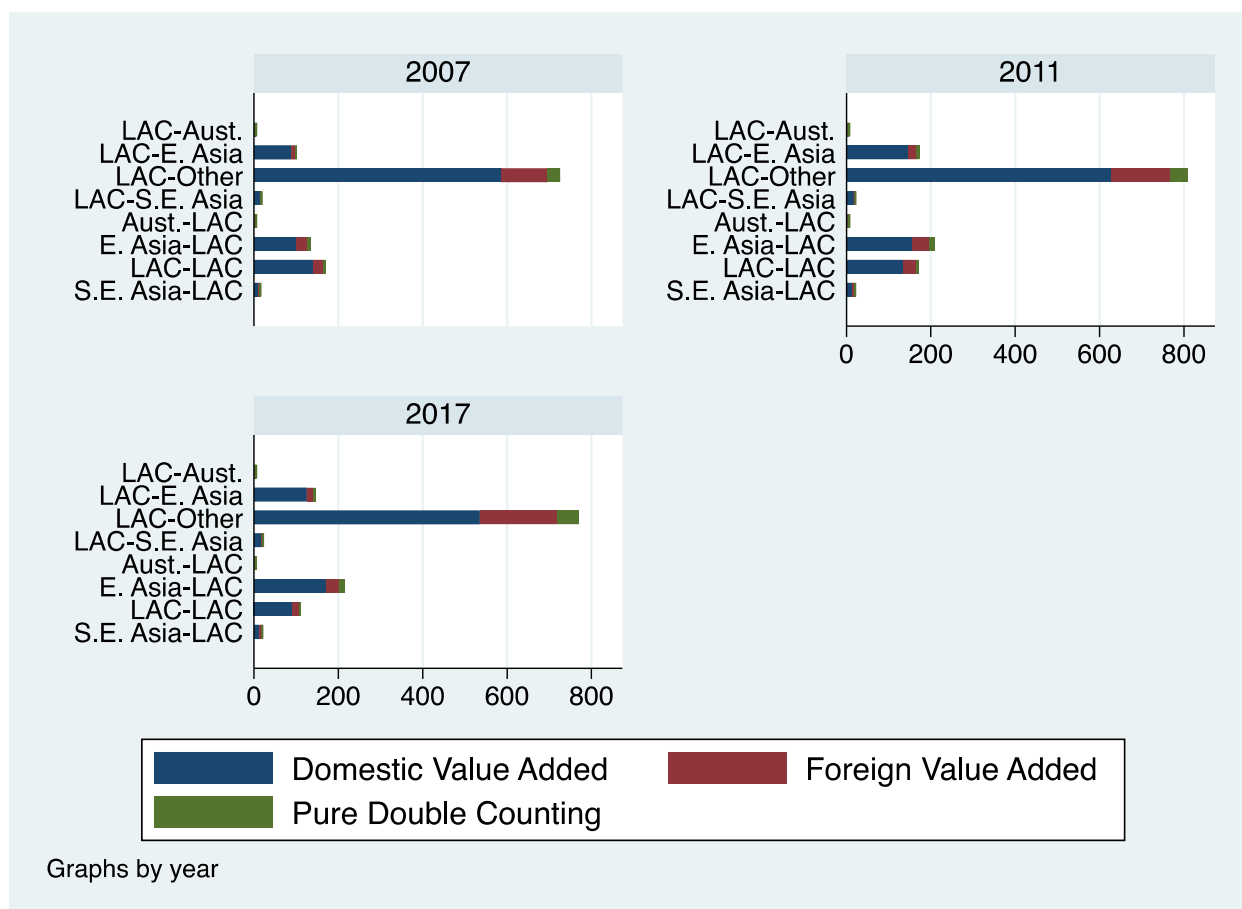


Source: ADB MRIO; and author's calculations.

Finally, figure 4 shows Latin America's trade relationships. On the export side, it is the other group that is the most important market for these countries. However, intra-regional trade is also important, as is the connection with East Asia. By contrast, links with South-East Asia and Australia are very small in the context of the region's overall trade relations.

Figure 4. The value-added exports between Latin America and its FEALAC partners, 2007-2017

(Billion USD)



Source: ADB MRIO; and author's calculations.

This first analysis shows that, in line with ITC (2017), intra-regional trade is typically important in each of the subregions under study. In addition, the pattern of inter-regional connections varies substantially from one case to another, in line with determinants like geography and trade complementarity. However, from the perspective of links between East Asia and Latin America, it is fair to conclude that within the FEALAC framework, the linkage is more important as a percentage of total trade for Latin America than it is for East Asia. In more specific terms, the relationships of most interest are clearly between Latin America and the East Asian subregion as defined here, as opposed to Australia and South-East Asia. Namely, although all subregions are included in the FEALAC group, it is primarily links between Latin America and the East Asian countries that are most significant economically, at least

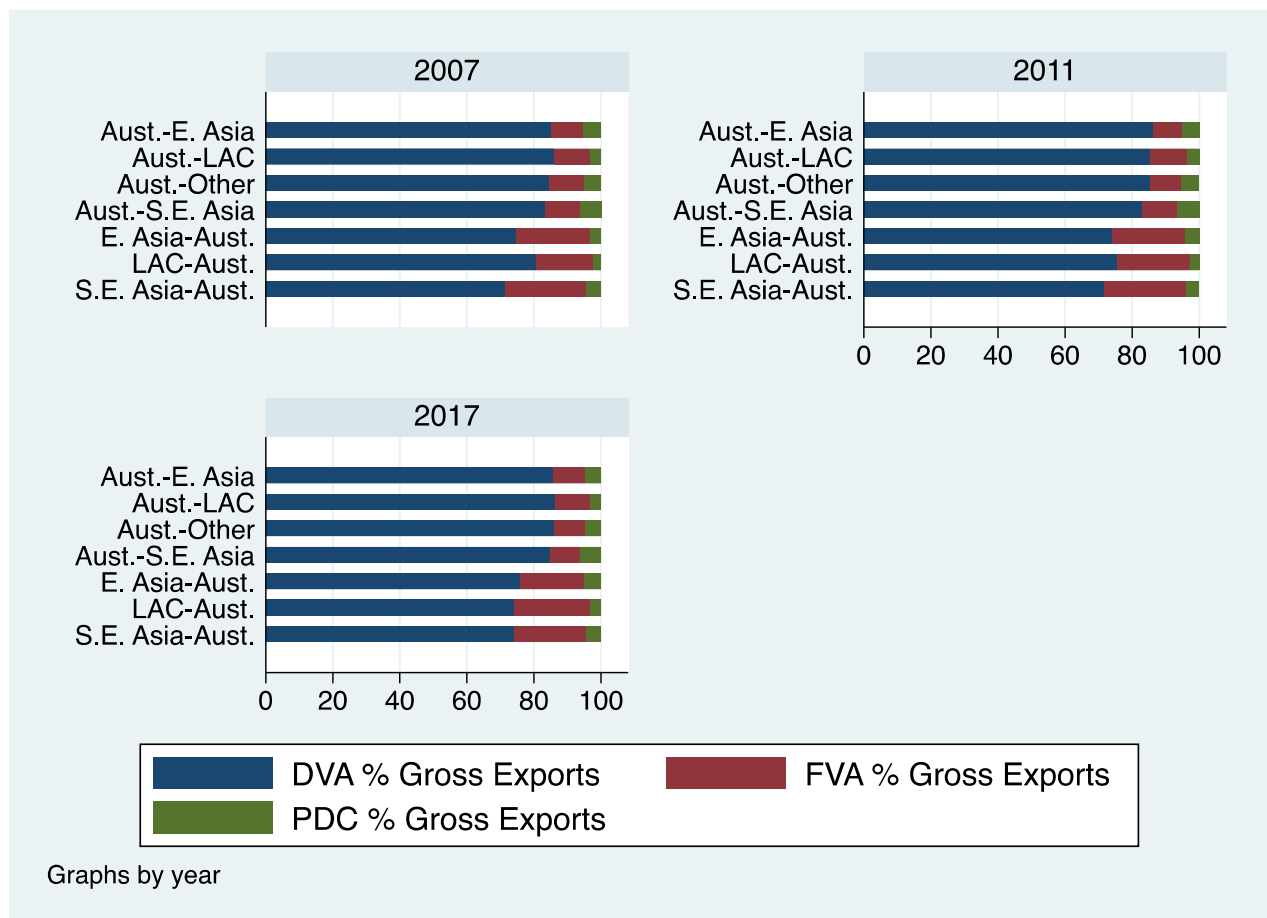
in terms of this simple metric, that is, the total value of bilateral trade relative to other directions of trade.

A more informative picture of the importance of GVC trade within the above context comes from converting the above figures (expressed in levels) to percentage terms. So instead of seeing absolute dollar amounts of trade, the following figures show the percentage of gross exports accounted for by each value added aggregate. In interpreting these graphs, it is important to keep in mind the different totals in dollar terms. In proportional terms, however, larger bars for FVA and PDC are indicative of a greater relative prevalence of GVC trade on a particular bilateral link.

Taking Australia first (figure 5), the relative pattern of GVC trade is quite stable over time. GVC trade is noticeably more prevalent on the import side than the export side. In other words, the exports of other subregions to Australia display a higher proportion of GVC trade than do Australia's exports to those other subregions. For all three partner regions, around 30% of their exports to Australia are related to GVCs, in the sense that they embody value added originating outside the country of origin. In the other direction, Australia's exports to those regions only include around half as much GVC trade. In terms of the relative composition of trade, as opposed to its total level, there is little difference across sub regional partners from Australia's point of view.

Figure 5. The value-added structure of exports between Australia and its FEALAC partners, 2007-2017

(Percent)

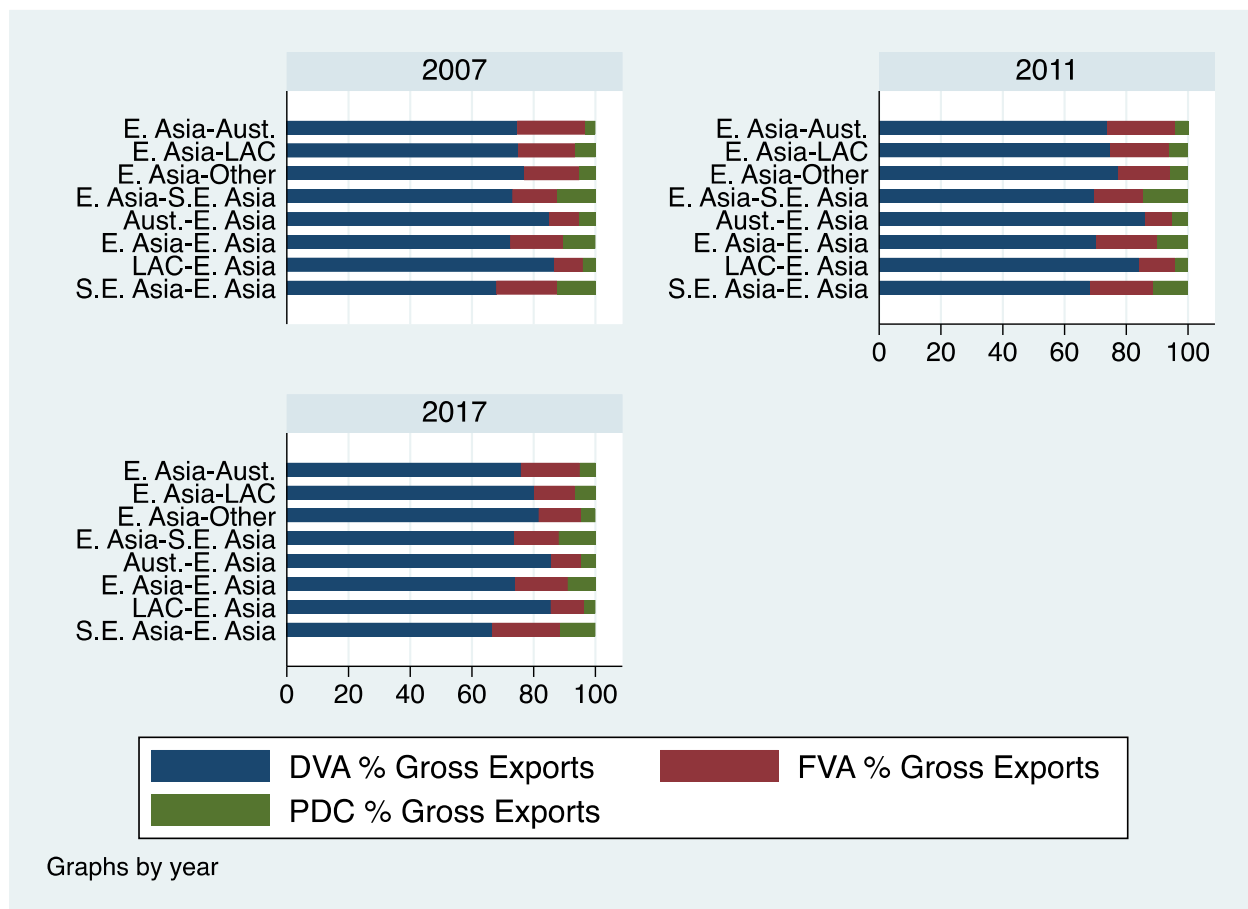


Source: ADB MRIO; and author's calculations.

Results for East Asia are in figure 6. The overall pattern of the different value added aggregates is again relatively stable over time. However, the situation is different from the one described for Australia, in that most bilateral relationships involve a substantial amount of GVC trade. Exports from South-East Asia to East Asia are close to 40% GVC trade, the largest proportion. Within that conclusion, the contribution of PDC is important: it contributes more towards vertical specialization (the sum of FVA and PDC) than in other direction so trade examined in this report. But East Asia's exports to other regions are consistently 20% or more GVC trade. However, exports from Latin America and Australia to East Asia have a noticeably lower proportion of GVC trade, closer to 15%.

Figure 6. The value-added structure of exports between East Asia and its FEALAC partners, 2007-2017

(Percent)

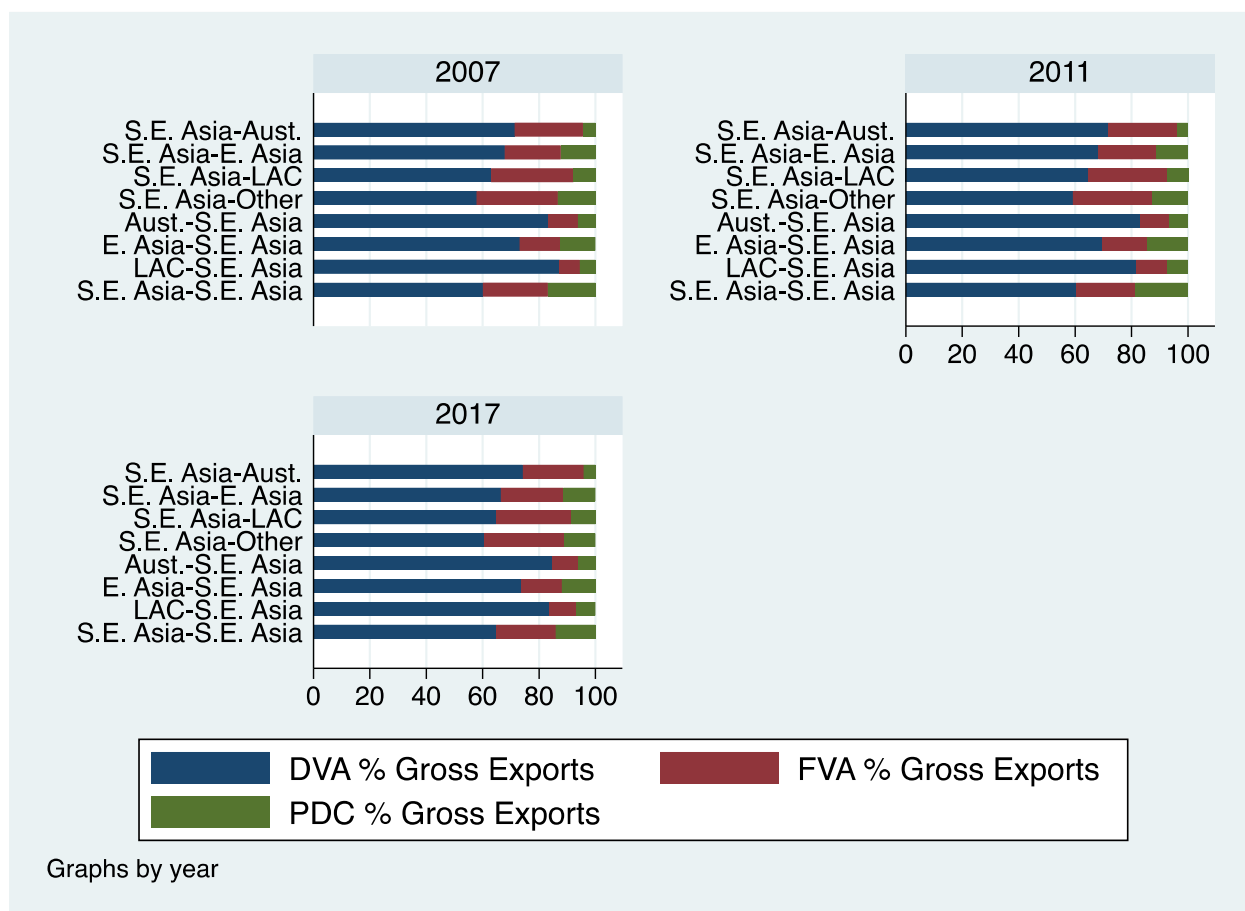


Source: ADB MRIO; and author's calculations.

Figure 7 shows comparable results for South-East Asia. As for the other subregions, the relative pattern of value added trade is quite stable over time. Focusing then on 2017, it is noticeable that South-East Asia has a generally high proportion of GVC trade in its exports, as high as 40%, and that this level is reasonably consistent across the subregions considered except Australia, where the proportion is lower. A relatively high proportion of PDC is also notable. On the import side, the proportion of GVC trade is noticeably lower, particular for Latin America as the origin subregion. Finally, intra-regional trade in South_East Asia has a strong proportion of GVC trade, noticeably higher than for the other subregions examined so far.

Figure 7. The value-added structure of exports between South-East Asia and its FEALAC partners, 2007-2017

(Percent)

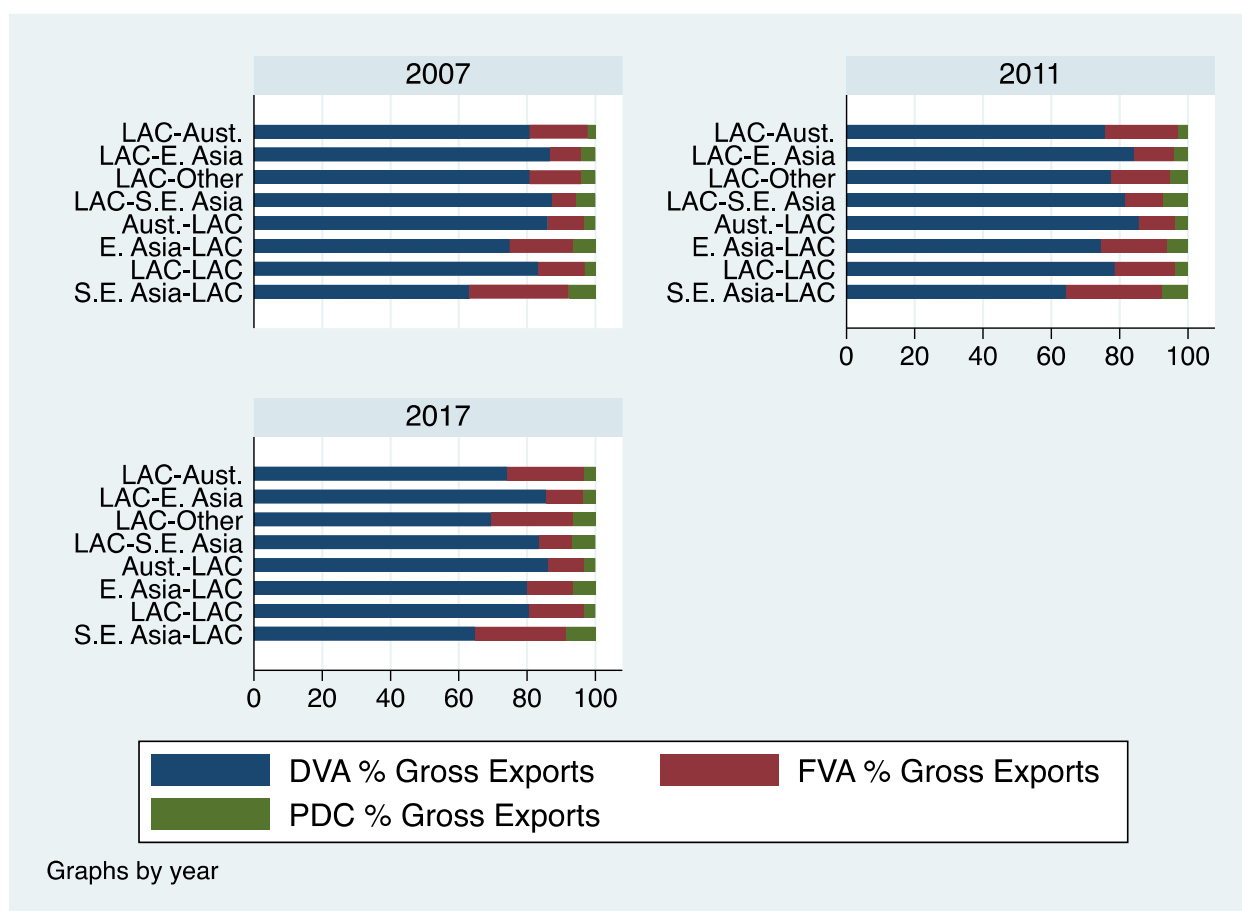


Source: ADB MRIO; and author's calculations.

Finally, figure 8 considers Latin America. While the pattern of value added trade in relative terms is again quite stable over time, the proportion of GVC trade is generally lower than what is seen in other regions, typically 20% or less. The exception is exports from South-East Asia to Latin America, which are accounted for to the extent of nearly 40% by GVC trade. Even the proportion of GVC trade in intra-regional trade is relatively small compared with some of the other subregions considered.

Figure 8. The value-added structure of exports between Latin America and its FEALAC partners, 2007-2017

(Percent)



Source: ADB MRIO; and author's calculations.

Taking these results together, the key conclusion is that GVC trade is generally better developed in Asia, particularly East and South-East Asia, than in Latin America, as evidenced by a greater proportion of FVA in gross exports. This finding means that firms in the Asian subregions tend to use more intermediate inputs sourced from other countries in the production of their exports than do firms in Latin America. With the exception of exports from South-East Asia to Latin America, which have a strong GVC component, trade relationships between the latter and other subregions generally exhibit only low to moderate levels of GVC participation.

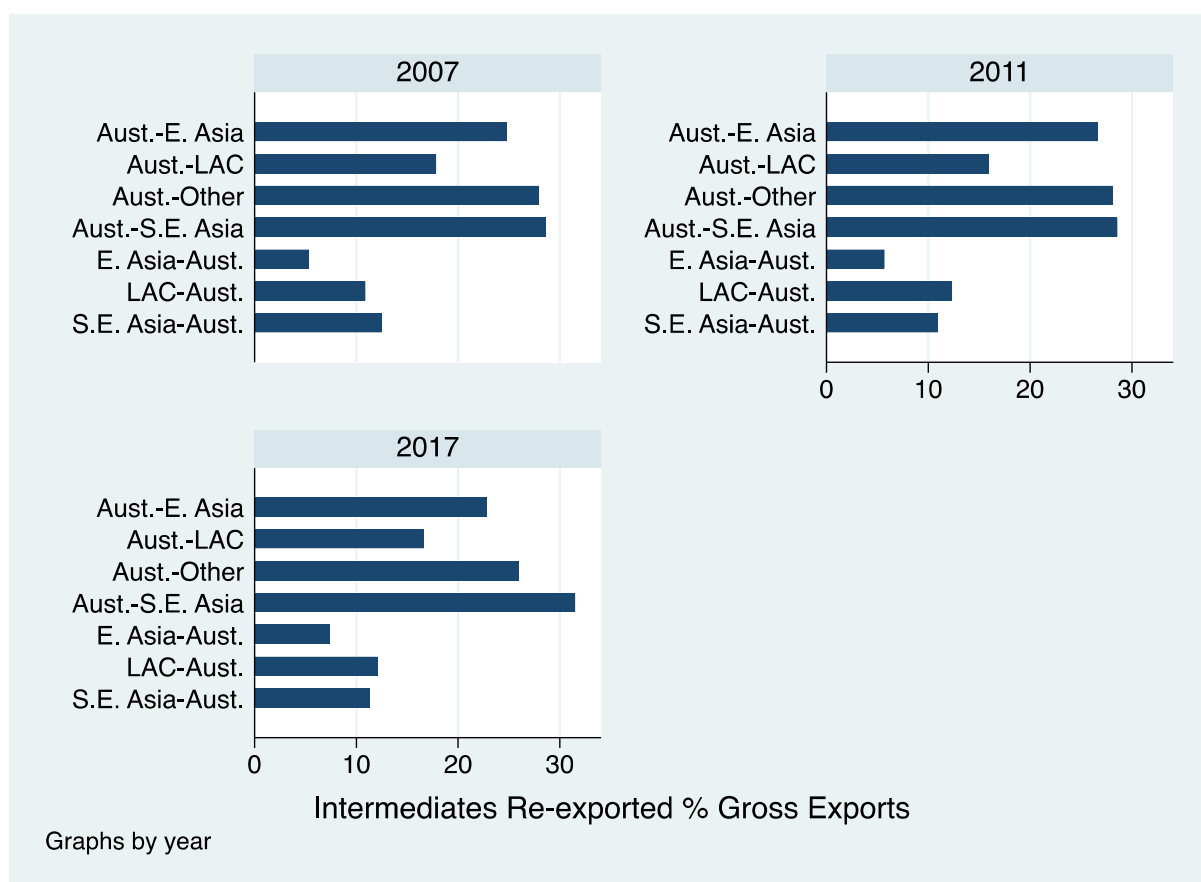
Thus far, the analysis has taken a backward linkage (inputs) approach to analyzing the prevalence of GVC trade along different bilateral routes. But as discussed in the methodology section, it is also possible to take a forward linkage (re-exports) approach, by analyzing DVA_INTrex, or the proportion of gross exports that is accounted for by

intermediates used by other countries in the production of their own exports. This element is part of the DVA aggregate in the previous figures, but it is useful to consider it separately, because it is in some ways the flipside of the above analysis, which focused on FVA and PDC, and can display different patterns and dynamics.

Figure 9 shows the relevant data for Australia. The overall pattern is reasonably stable over time. Australia's exports include between 20% to 30% intermediates that other countries use in the production of their own exports. This is a substantial level of GVC integration, but the level is noticeably lower with Latin America than with the Asian subregions. On the import side, this proportion is small, around 10% or less. The picture that emerges from figure 9 is that Australia plays an important role in supplying inputs to other countries that they then use in the production of exports, but engages in relatively little such trade in the opposite direction. The data are consistent with Australia being a supplier of intermediates, likely raw materials given the country's pattern of specialization, rather than an assembly location that brings intermediates together from other countries.

Figure 9. The share of forward linkages in exports between Australia and its FEALAC partners, 2007-2017

(Percent)

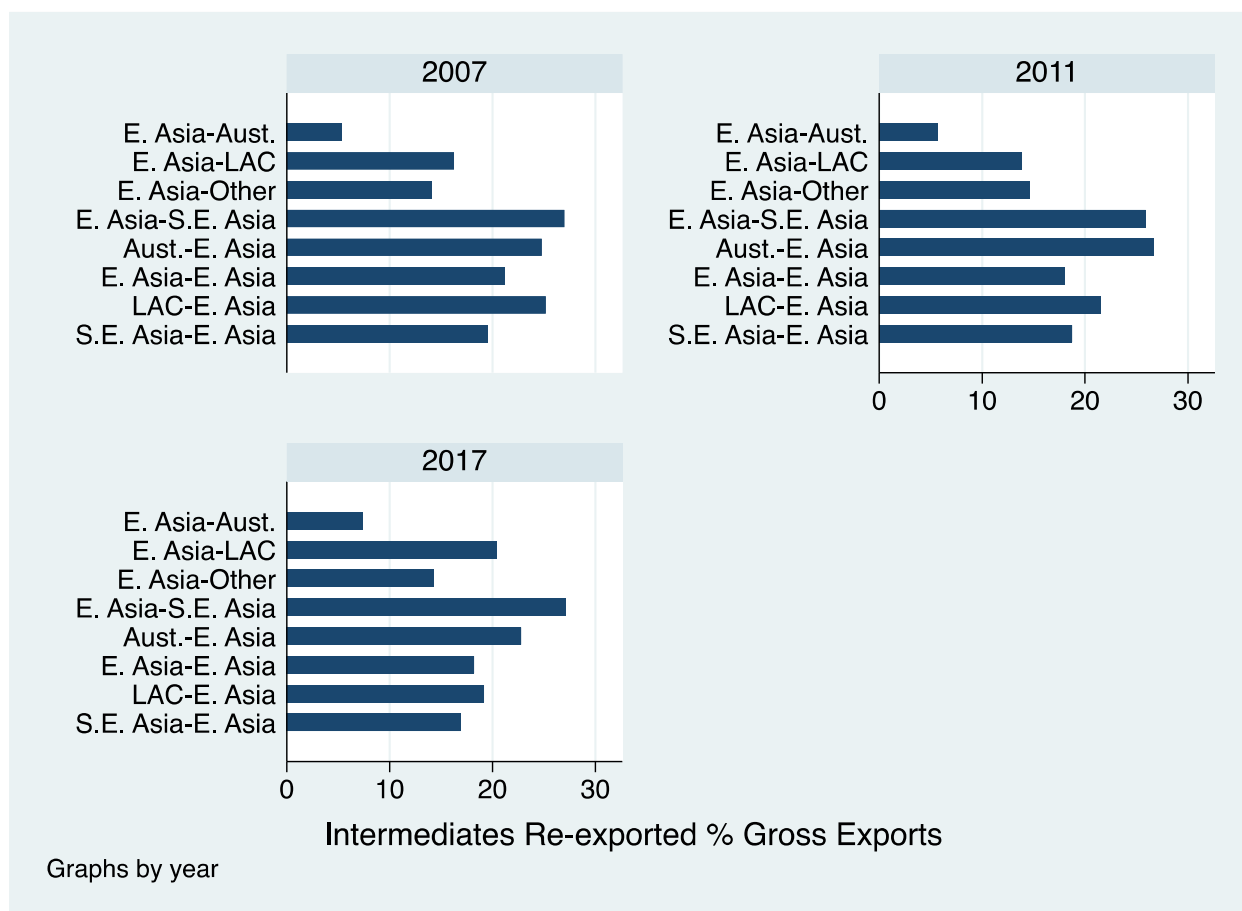


Source: ADB MRIO; and author's calculations.

Results for East Asia are in figure 10, and as in previous figures, there is reasonable stability of the numbers over time. Zooming in on 2017, it is clear that the export link with South-East Asia is the one where the highest proportion of forward GVC trade takes place, close to 30%. Intra-regional trade and exports to Latin America still have substantial, albeit lesser, proportions of forward GVC trade, at around 20%. The relationship with Australia, as noted above, is more one way: Australia's trade has a strong proportion of inputs used in East Asia's exports, but the latter's exports back to Australia seem to be focused on value added that then stays in Australia.

Figure 10. The share of forward linkages in exports between East Asia and its FEALAC partners, 2007-2017

(Percent)

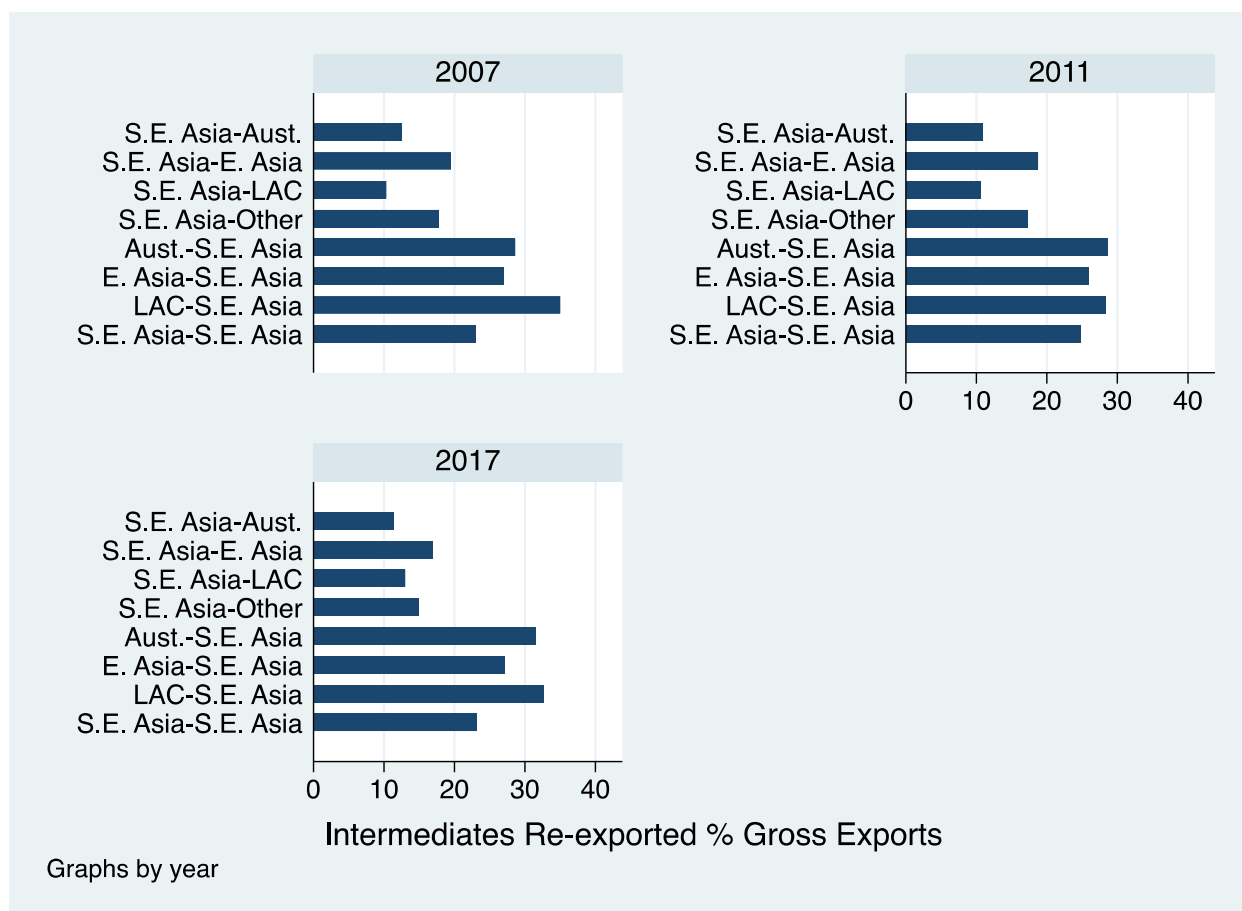


Source: ADB MRIO; and author's calculations.

Figure 11 considers South-East Asia, where in 2017, it was primarily on the import side that there were forward GVC linkages. South-East Asia's own exports to the other subregions typically only had around 10% DVA_INTrex, or a little more, with the exception of intra-regional trade, where the figure is over 20%. Interestingly, Latin America's exports to South-East Asia have the highest proportion of intermediates used in the production of exports of any of the subregions under consideration, slightly ahead of Australia.

Figure 11. The share of forward linkages in exports between South-East Asia and its FEALAC partners, 2007-2017

(percent)

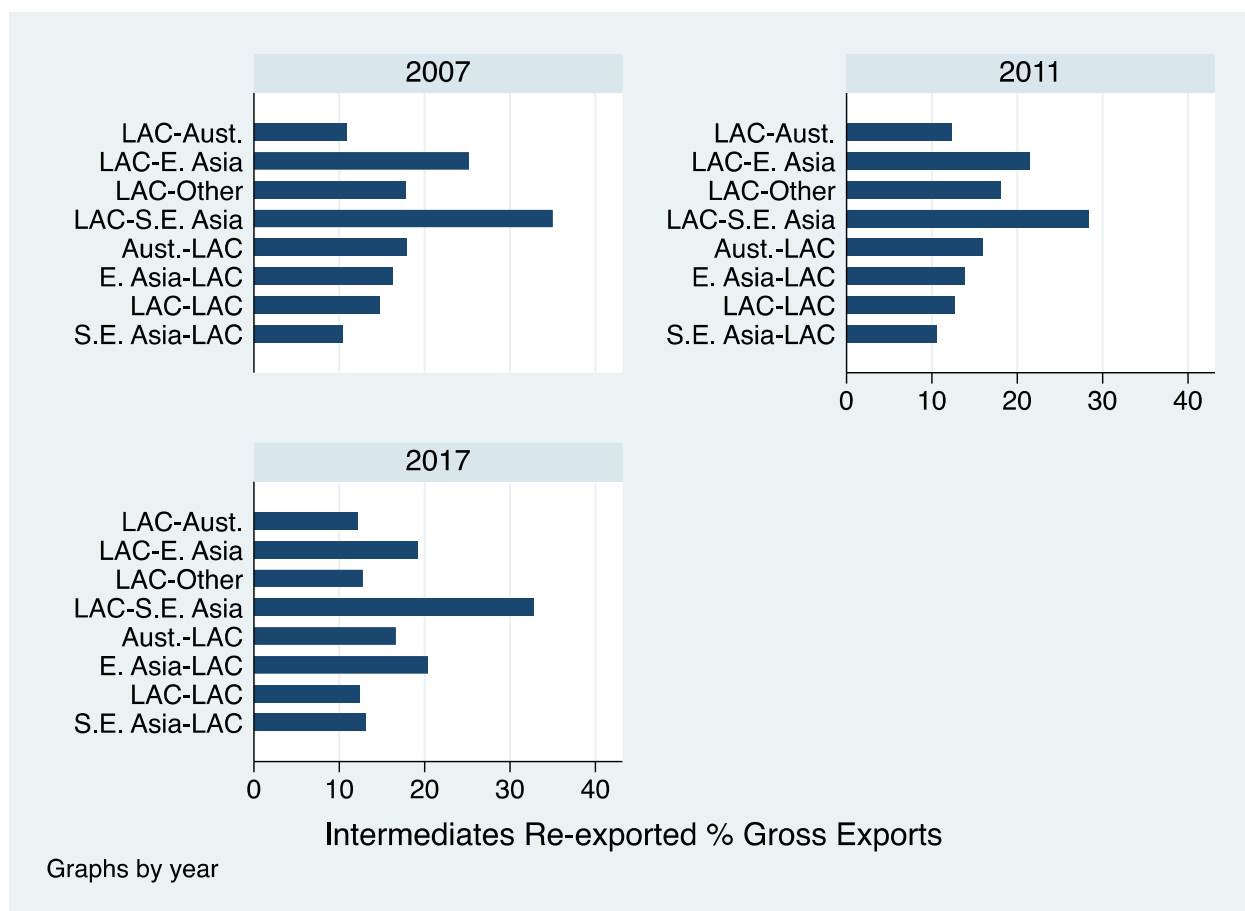


Source: ADB MRIO; and author's calculations.

Finally, figure 12 examines Latin America. It is unsurprising from the above analysis that the crucial linkage is with South-East Asia: over 30% of Latin America's gross exports to South-East Asia are accounted for by intermediates subsequently used in the production of exports. Figures for other sub regional linkages are considerably lower, below 20% in all cases. There is also more consistency than is evident for the other regions, and intra-regional trade has a relatively low level of forward GVC trade. In a dynamic sense, there is a notable decline in forward GVC trade with East Asia between 2007 and 2017, which would be consistent with relatively less involvement in one type of GVC trade between the two regions.

Figure 12. The share of forward linkages in exports between Latin America and its FEALAC partners, 2007-2017

(percent)



Source: ADB MRIO; and author's calculations.

Combining all of the pieces of analysis from this section, it is clear that GVC trade is more important for the relationship between Latin America and Asia than a simple backwards analysis would suggest. Latin America, like Australia, is an important supplier of intermediate inputs to Asia, in particular South-East Asia. However, more generally speaking, combining the backward and forward analysis, it can be seen that GVC trade is less prevalent between Latin America and East Asia, as defined in this paper, than it is within East Asia itself.

Of course, the composition of trade and the pattern of sectoral specialization in the different regions can have a major impact on the type of aggregate analysis just presented. The next section therefore goes into more detail, focusing on individual sectors and countries.

4. Detailed analysis: Countries and sectors

Given the relative stability over time shown in the previous section, I limit detailed consideration by country and by sector to 2017 only. This limitation is without great loss of generality, as the general value added trade relationships examined above do not change too much over time, so it is possible to be confident that the sectoral and country analysis is applicable to more than just a single year.

The following subsections use the same metrics as above, but disaggregate the data in different ways. I first consider sectors, then countries.

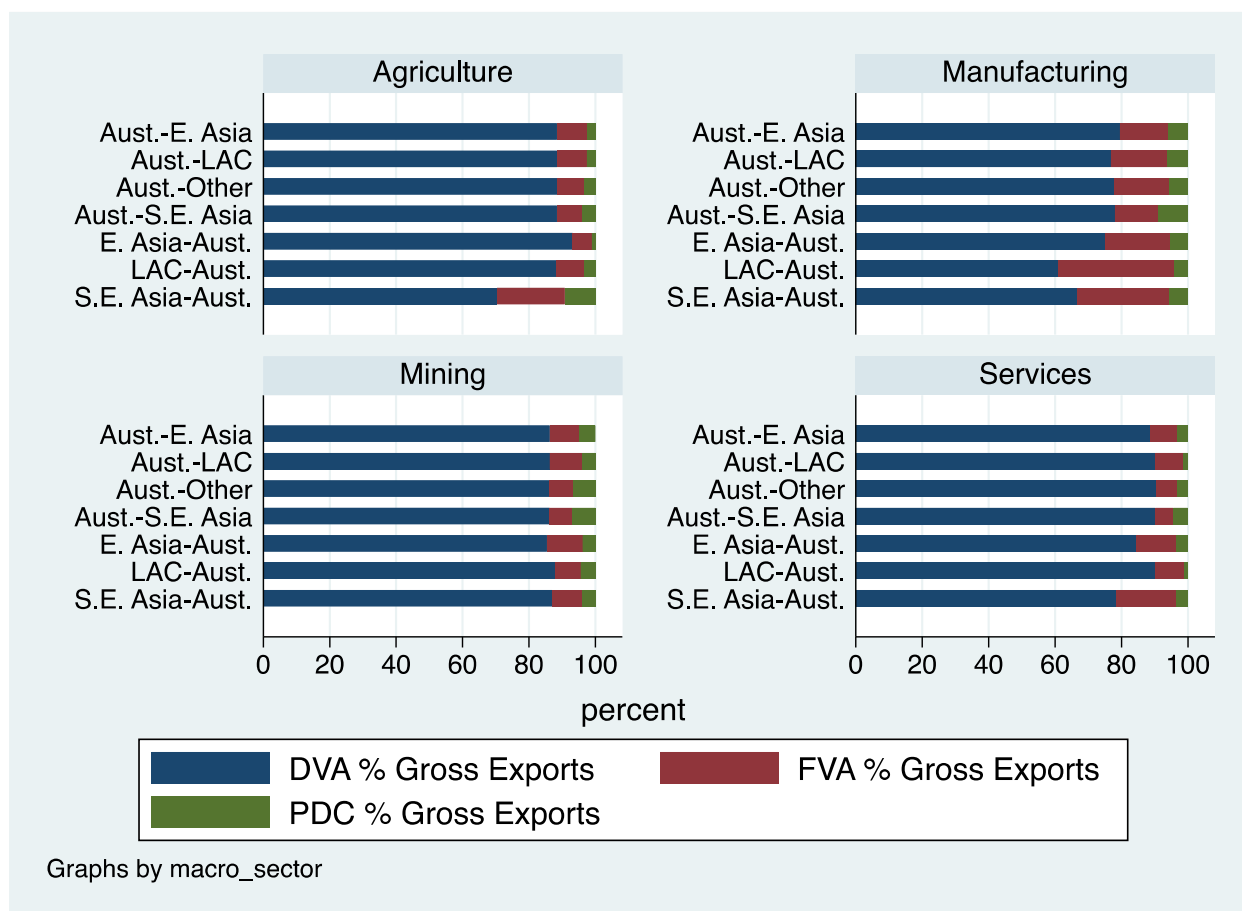
4.1 Sectoral analysis

The ADB MRIO identifies 35 individual sectors. However, zooming down to the maximum possible level of disaggregation would be uninformative on a policy level, because it would be impossible to identify general tendencies. I therefore group the 35 sectors into four “macro-sectors”: agriculture, mining, manufacturing, and services. These classifications correspond to major aggregates in the national accounts, and so are of immediate policy relevance. I drop sectors that are outside the commercial sector, such as government and private households with employees. Given the difficulty of classifying power generation, as well as the substantial government component in many countries, I exclude that sector from consideration.

Figure 13 presents results for Australia and partners. Of the four macro-sectors, it is clearly manufacturing where there is the highest proportion of GVC trade, focusing on the importance of FVA and PDC. Latin America and South-East Asia are both sources of intermediate inputs for Australia, but Australia itself uses relatively few internationally-sourced inputs in the production of its own exports. Generally, however, it is exports from South-East Asia where the proportion of GVC trade is highest; however it is also very significant for Latin American exports of manufactured goods to Australia, where the figure is in fact higher than for South-East Asia.

Figure 13. The value-added structure of exports between Australia and its FEALAC partners, by sector, 2007-2017

(Percent)

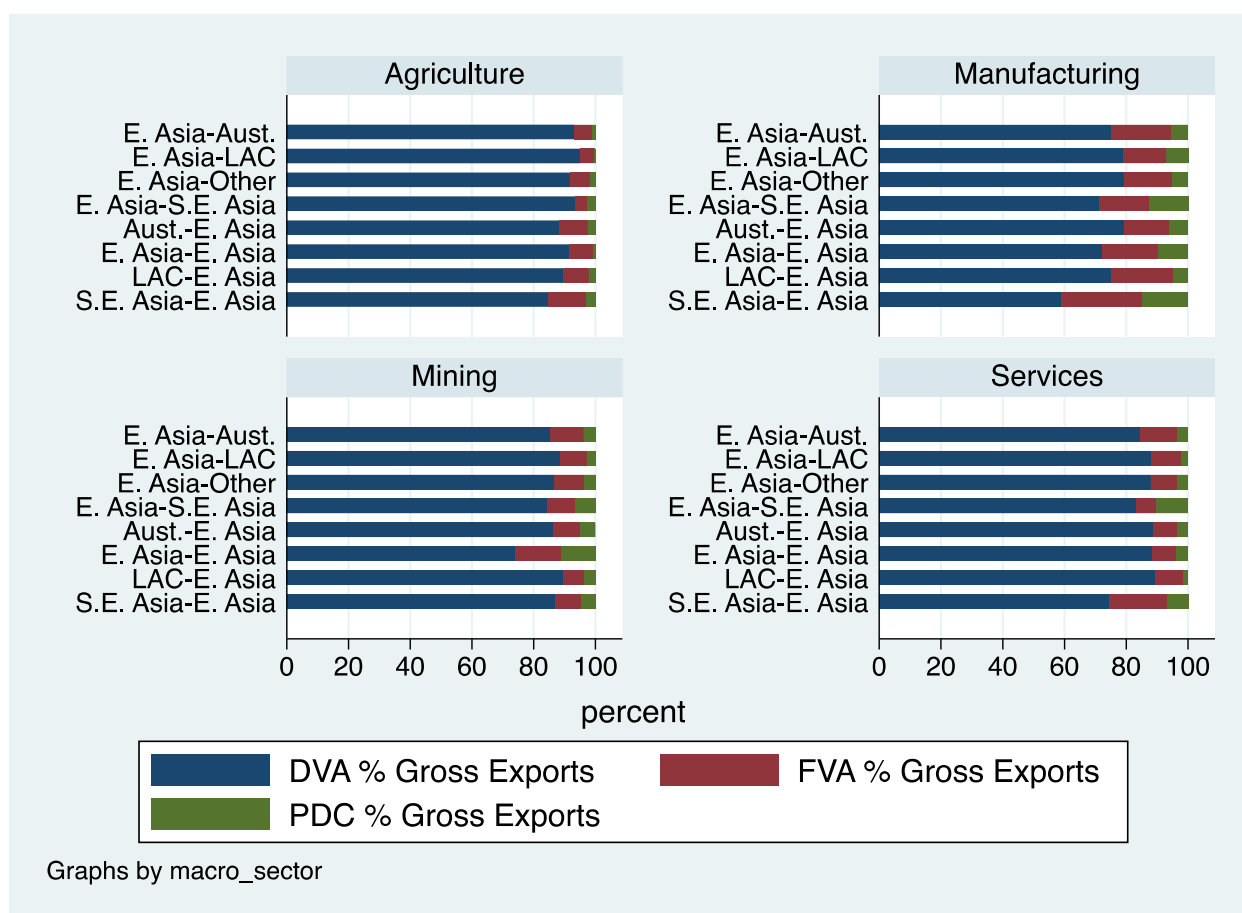


Source: ADB MRIO; and author's calculations.

Figure 14 provides the same analysis for East Asia. The outcome is the same in a key dimension: it is again the manufacturing sector where there is the highest proportion of GVC trade, as evidenced by the use of foreign-sourced intermediates. In all four macro-sectors, linkages are strongest intra-regionally, as well as with South-East Asia. In general, bilateral linkages with Latin America exhibit a relatively low level of GVC trade compared with other directions of trade.

Figure 14. The value-added structure of exports between East Asia and its FEALAC partners, by sector, 2007-2017

(Percent)

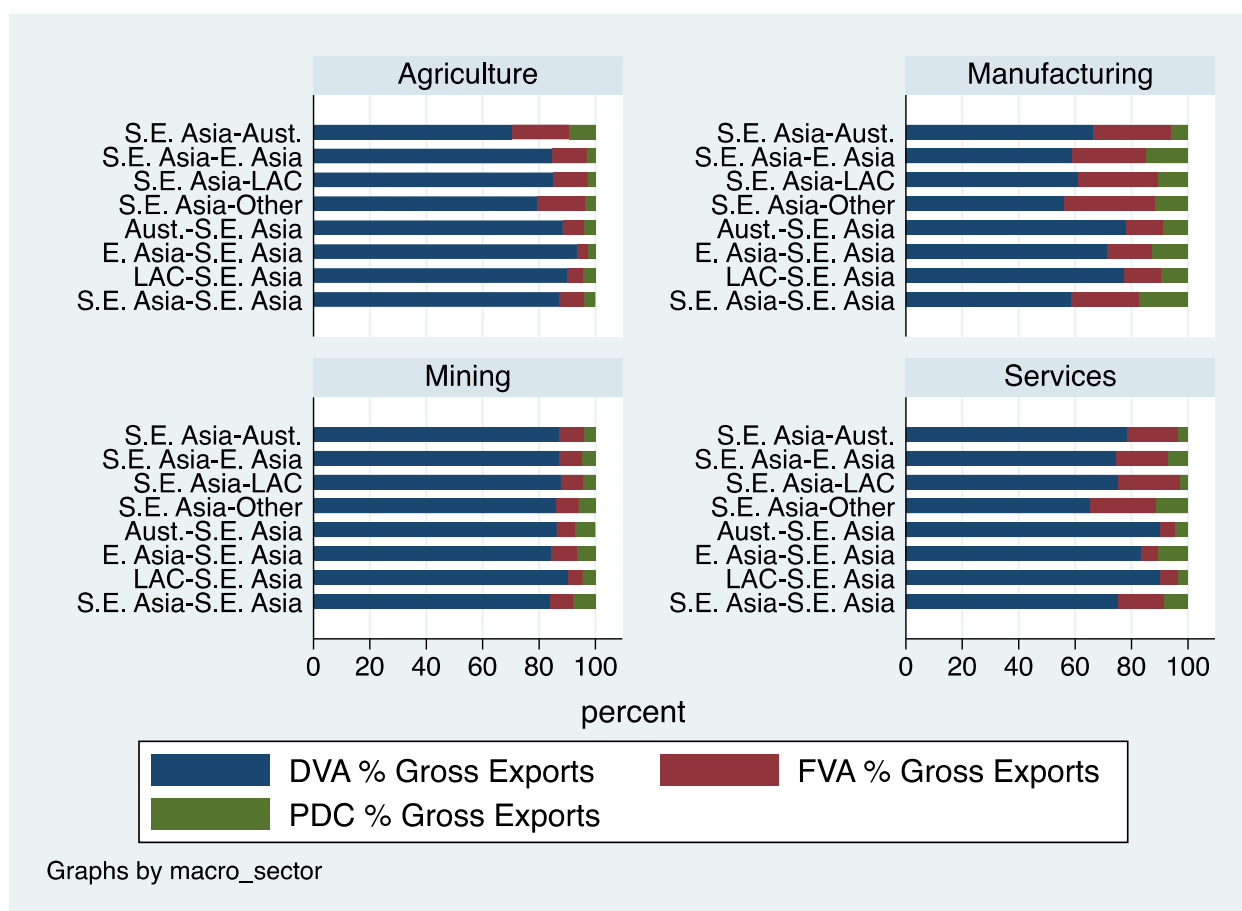


Source: ADB MRIO; and author's calculations.

South-East Asia is presented in figure 15. Manufacturing and to some extent services exhibit significant amounts of GVC trade, in the range of 20% to 30%. There is also more GVC trade for this subregion in agriculture than for the other subregions, particularly in terms of exports to Australia. In manufacturing exports from South-East Asia to Latin America are around 40% FVA and PDC, which indicates substantial GVC participation, while the figure is over 20% in services. However, in other sectors, bilateral trade with Latin America is typically more limited in terms of GVC participation, being one of the less intensive relations for South-East Asia.

Figure 15. The value-added structure of exports between South-East Asia and its FEALAC partners, by sector, 2007-2017

(Percent)

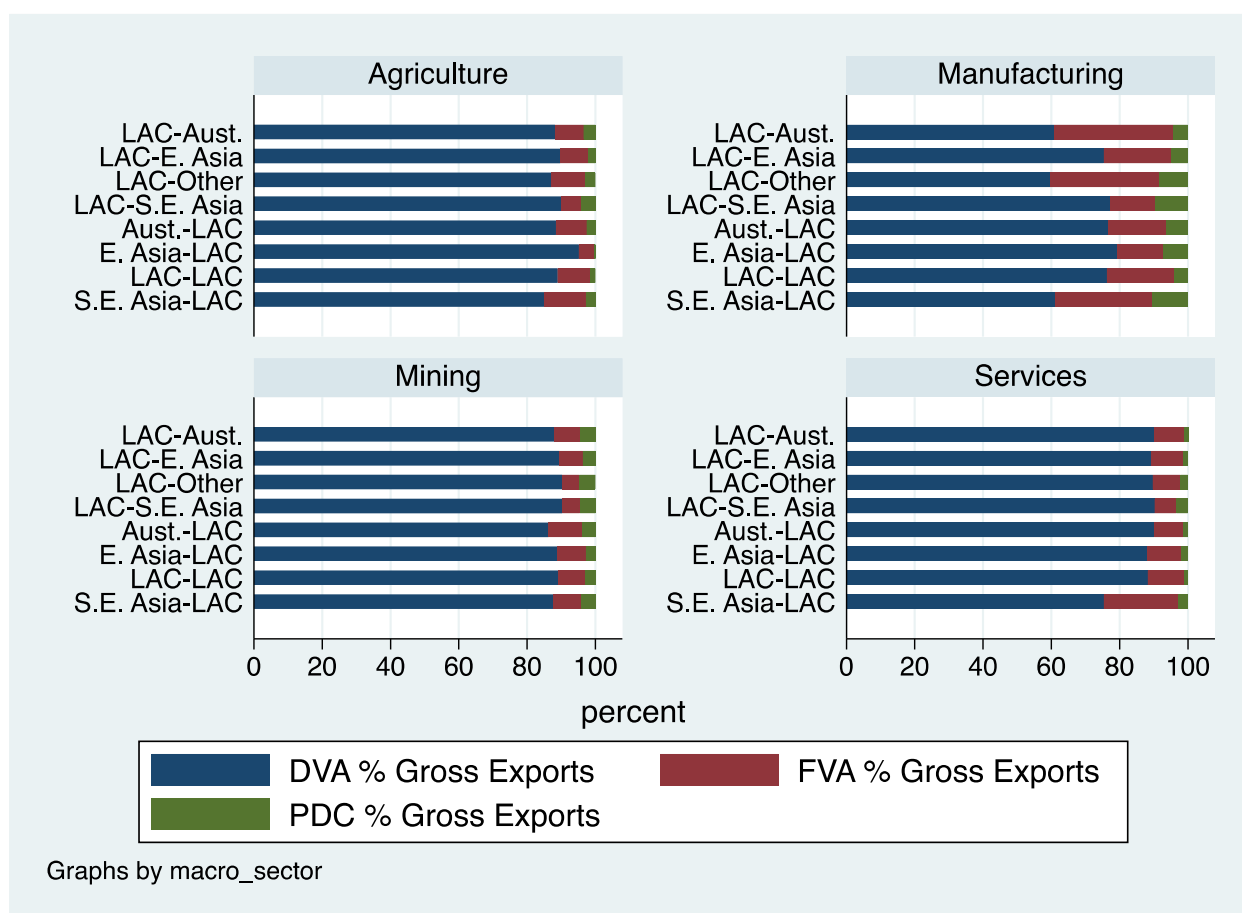


Source: ADB MRIO; and author's calculations.

Finally, figure 16 presents results for Latin America. The pattern is much the same as for the other subregions: manufacturing stands out as the macro-sector where GVC trade in most developed, as high as 40% of the value of gross exports in some cases. Linkages are well developed on the export side between Latin America and Australia, as well as with the other group, and on the import side with South-East Asia. The contrast between South-East Asia and East Asia is informative in this case, with considerably stronger linkages in the manufacturing sector for the former. The reason is perhaps due to the significant role played by China in the results for East Asia, and a possible dominance of exports to Latin America by consumer goods assembled there. Linkages in other macro-sectors are considerably weaker.

Figure 16. The value-added structure of exports between Latin America and its FEALAC partners, by sector, 2007-2017

(Percent)

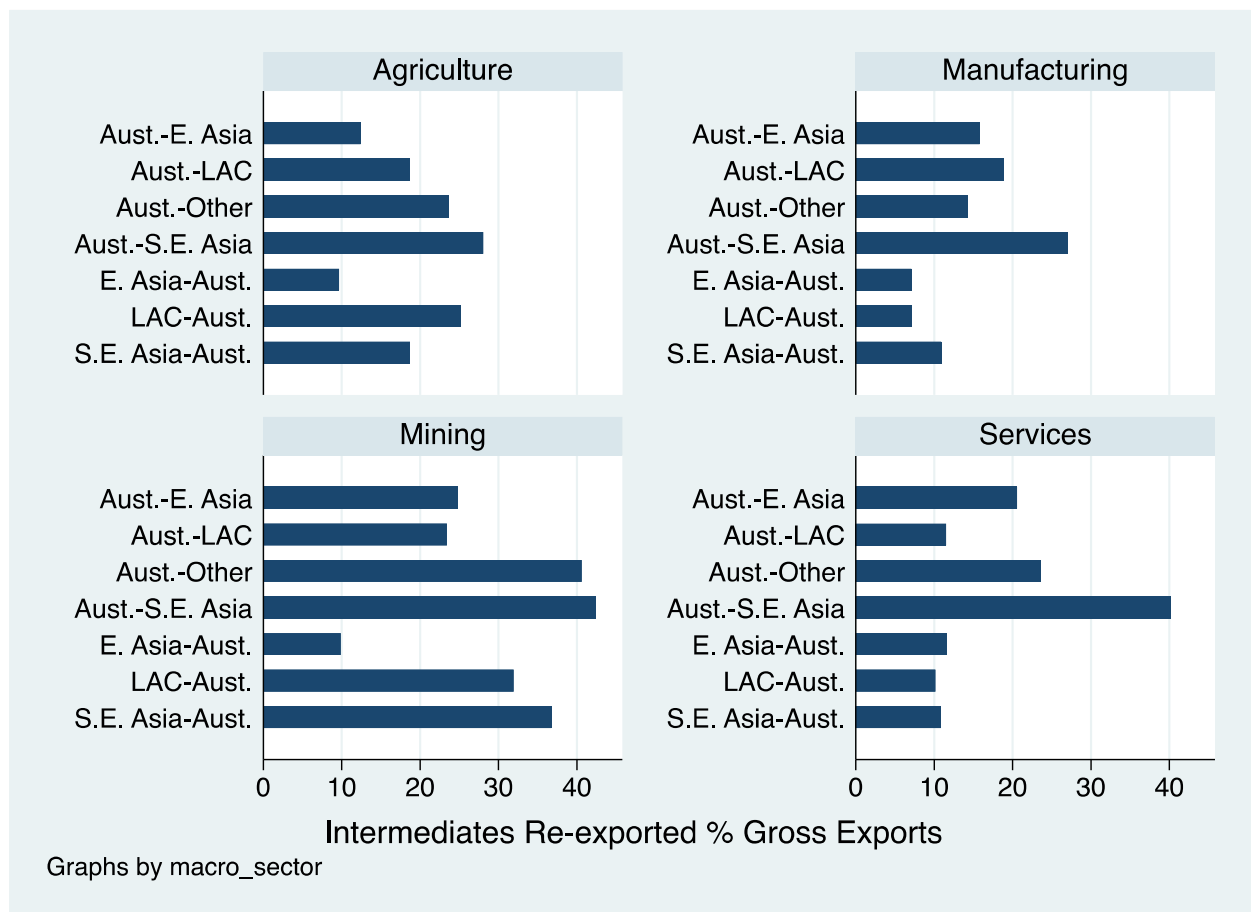


Source: ADB MRIO; and author's calculations.

The following figures take the forward perspective, focusing on exports of intermediates used to produce the importing country's exports to other destinations. Australia's results are in figure 17, and show a generally significant level of GVC trade from this perspective. Services, mining, and to a lesser extent agriculture stand out as sectors where Australian exports to partner subregions are significantly composed of intermediates later embodied in other exports. The degree of integration is noticeably weaker in manufacturing. It is primarily the export side that stands out as the area where Australia is engaged in this kind of GVC trade, thereby indicating, given its specialization, that it is engaged in regional and cross-regional GVCs through the supply of inputs, particularly primary materials but also services.

Figure 17. The share of forward-linked exports between Australia and its FEALAC partners, by sector, 2007-2017

(Percent)

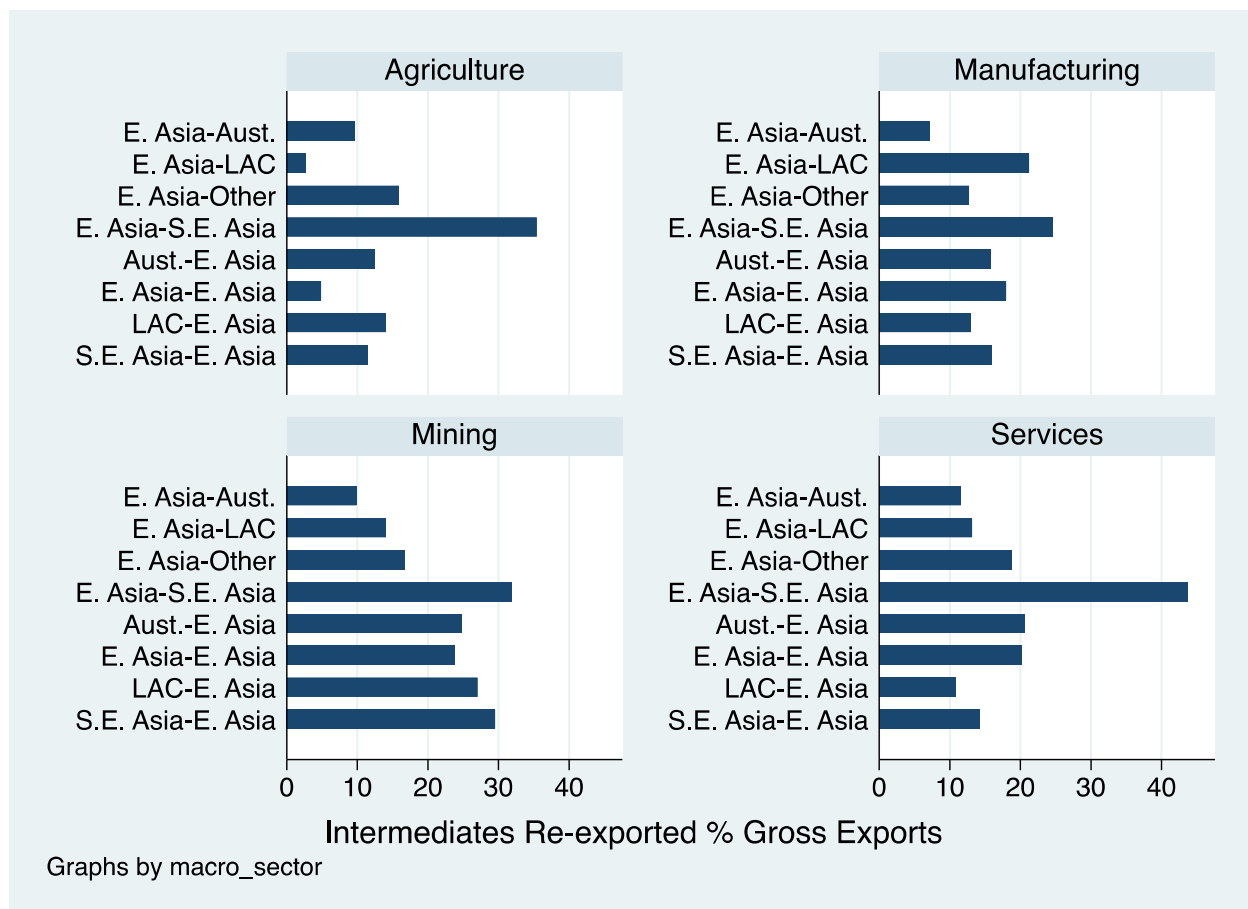


Source: ADB MRIO; and author's calculations.

East Asia, in figure 18, has a relatively larger level of involvement on the export side in manufacturing relative to Australia. On the import side, by contrast, GVC trade is more concentrated in primary sectors, with some involvement also in services. Taken together, these results are consistent with a scenario in which East Asia is a significant assembly hub for manufactured goods, as well as increasingly a producer of manufactured intermediate inputs. The subregion primarily uses primary materials as inputs into its exports, but also produces a significant quantity of manufactured intermediates that are used by other subregions.

Figure 18. The share of forward-linked exports between East Asia and its FEALAC partners, by sector, 2007-2017

(Percent)

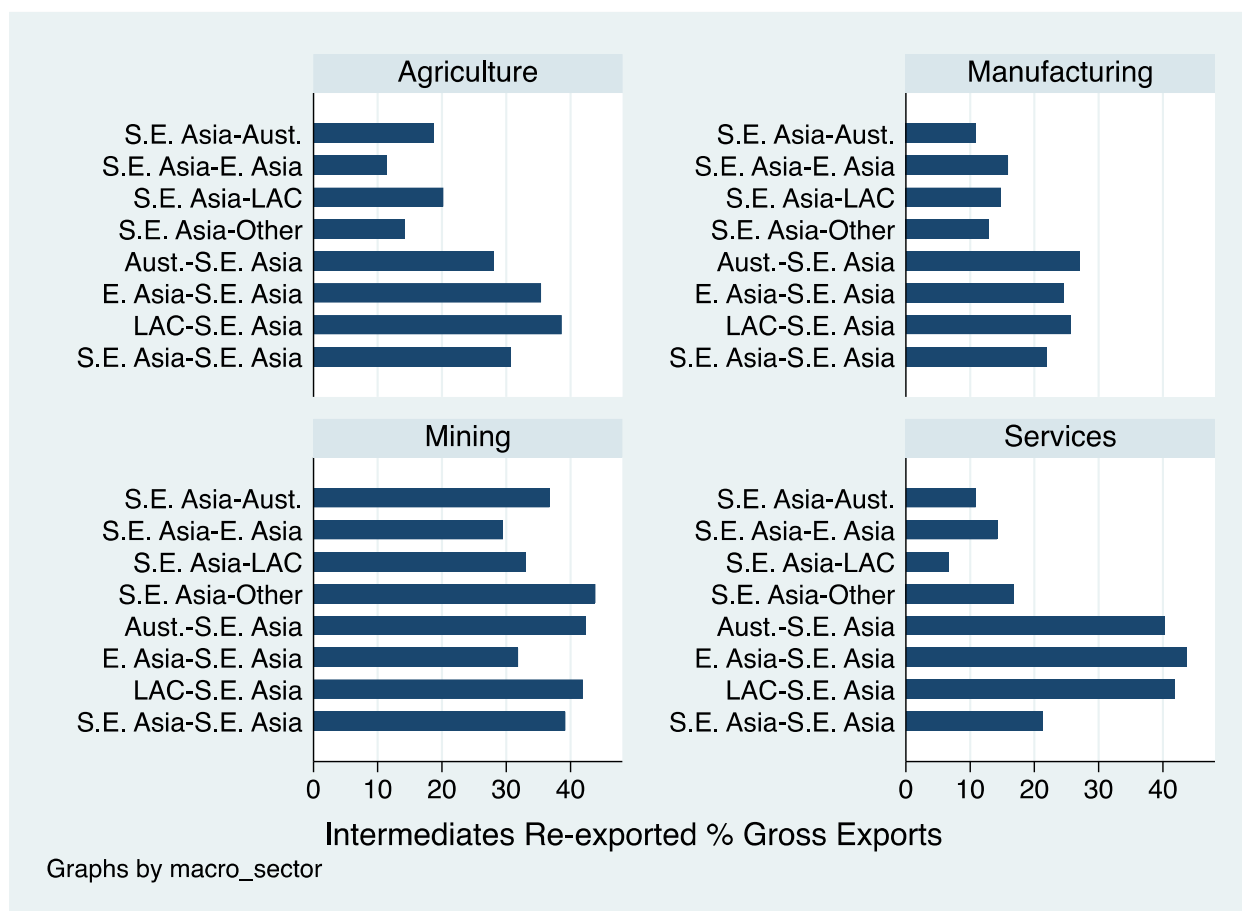


Source: ADB MRIO; and author's calculations.

Figure 19 shows results for South-East Asia. This subregion's forward GVC involvement is chiefly on the import side, as it receives substantial values of intermediates from other subregions in primary sectors, as well as in manufacturing. Export linkages are strongest in manufacturing intra-regionally, as well as across most regions in mining. In terms of the nature of the subregion's GVC trade, it represents an intermediate case: there is involvement both as an assembly location, absorbing primary materials for transformation and re-export, but it is also a supplier of some primary materials; however, other than intra-regionally, it is not engaged as a manufacturing export hub like East Asia.

Figure 19. The share of forward-linked exports between South-East Asia and its FEALAC partners, by sector, 2007-2017

(Percent)

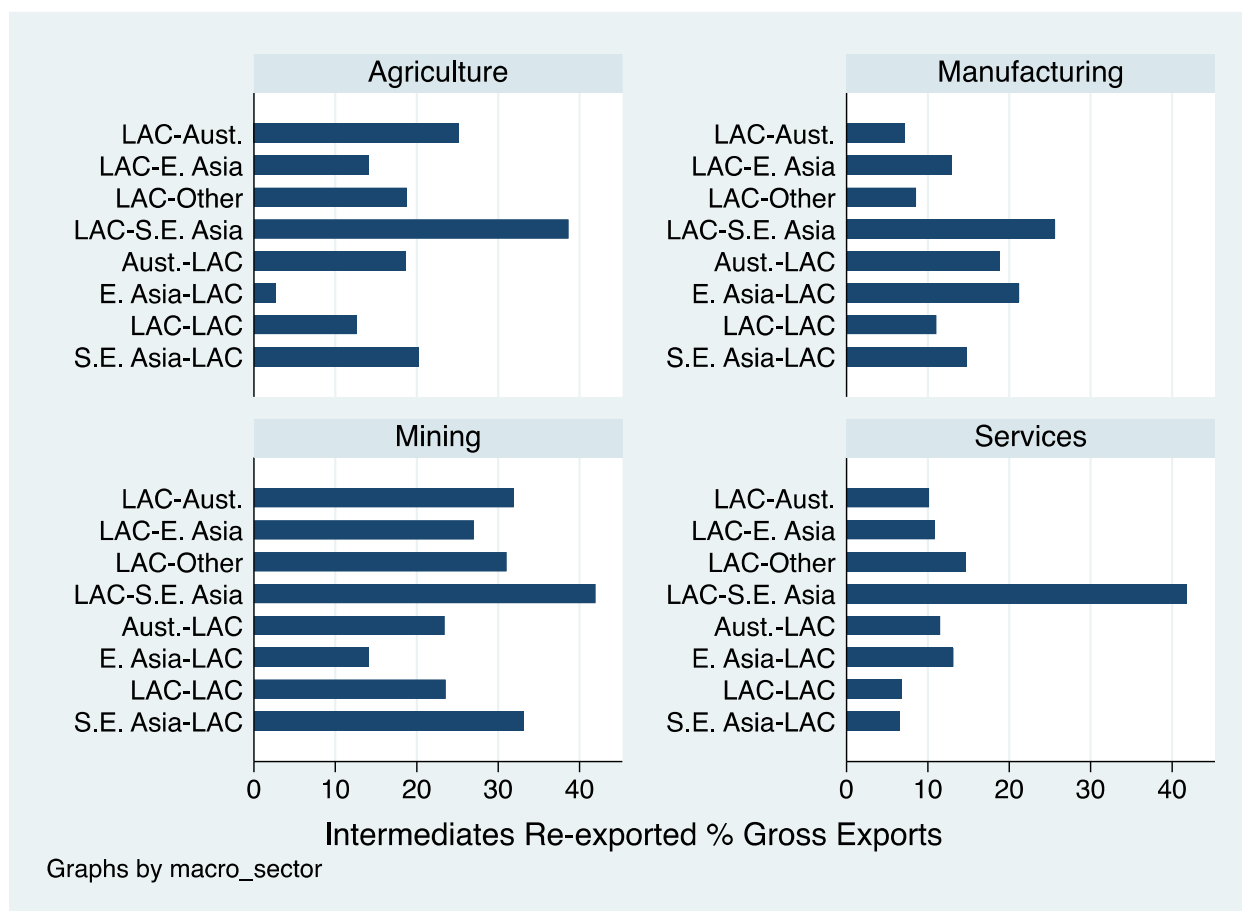


Source: ADB MRIO; and author's calculations.

Results for Latin America are in figure 20. On the export side, South-East Asia stands out as a destination that absorbs a considerably quantity of Latin America's exported intermediates and transforms them to produce its own exports. This pattern is in evidence particularly in services, mining, and agriculture, but also to some extent in manufacturing. GVC involvement in the other dimensions and directions is more muted, although there is some evidence of forward GVC trade in all cases. These data suggest that Latin America, to some extent like Australia, plays its main role in cross-regional GVCs as a supplier of intermediate inputs, particular primary products. There is little evidence that it acts as manufacturing or assembly hub at this stage.

Figure 20. The share of forward-linked exports between Latin America and its FEALAC partners, by sector, 2007-2017

(Percent)



Source: ADB MRIO; and author's calculations.

The sectoral analysis has put important additional detail into the analysis of GVC participation conducted in the previous section. There are clear differences in sectoral specialization and GVC participation across regions that are not necessarily obvious from the aggregate statistics. However, these data sit well with an intuitive understanding of patterns of comparative advantage across the various subregions. First, East Asia has a strong role both as an assembly hub in manufacturing, and as a source of manufactured intermediates. Australia and Latin America primarily provide primary products, but also significant quantities of services, for the most part other business services. South-East Asia is in a more uncertain role, given that its GVC involvement is most strongly intra-regional, but that other directions of integration are less developed. Taking the results together suggests that while there are significant amounts of cross-regional GVC activity, generally speaking the links between Latin

America and East Asia, as defined here, are less developed than those between East Asia and closer partners.

4.2 Country analysis

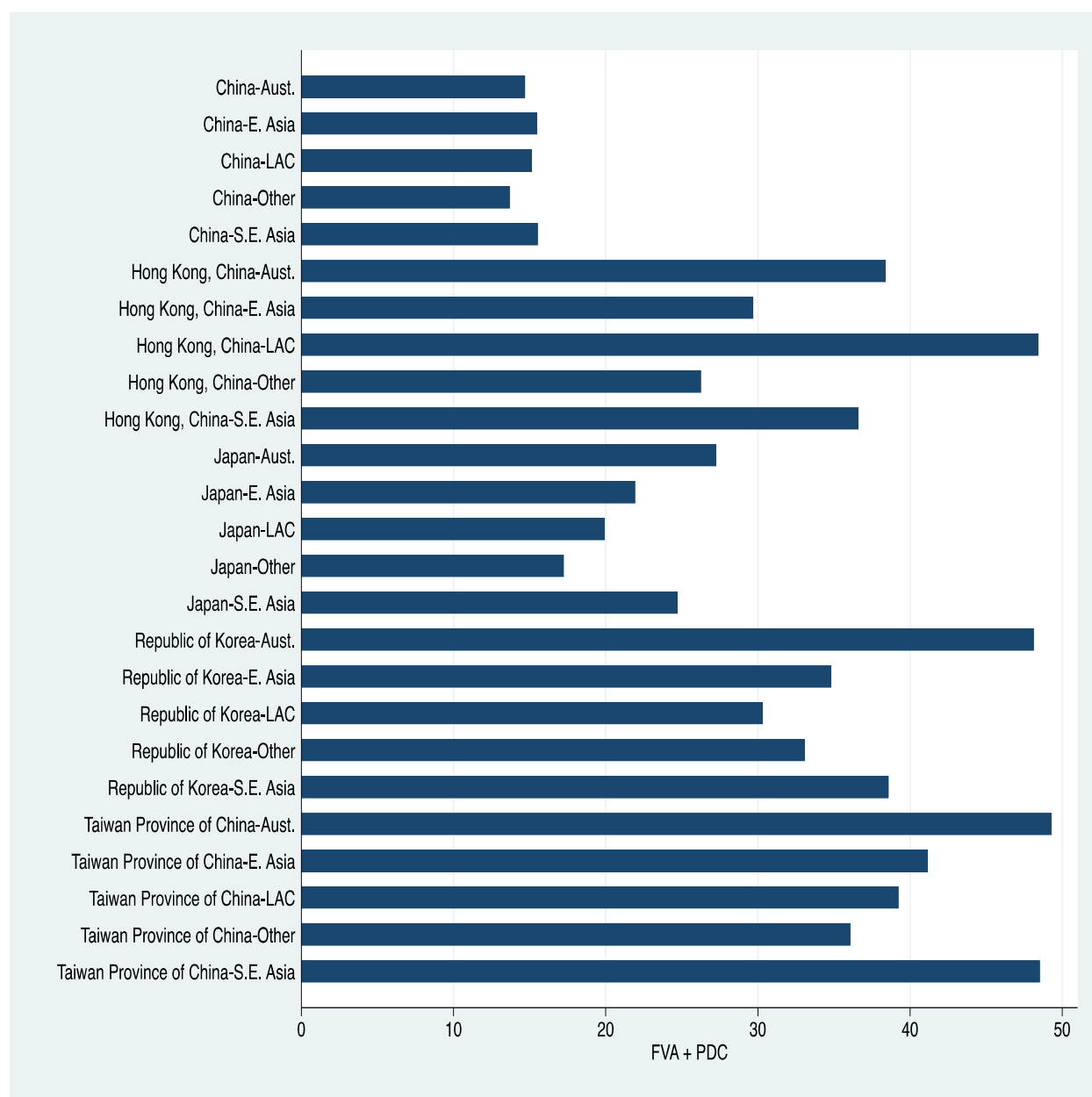
Just as moving from an aggregate consideration to the sector level can bring to light important features of the data, so too is it important to unpack regions into their constituent countries. Comparing and contrasting performance across countries within a region can be informative not only as to relative patterns of specialization, but also potentially as to policy differences that give rise to different observed outcomes.

To simplify the visual presentation, the country level analysis does not fully decompose gross exports into the three major aggregates, as above. Instead, it extracts the total of FVA and PDC, and expresses it as a percentage of gross exports. A higher percentage is indicative of a greater degree of GVC integration. In what follows, the disaggregation only considers East Asia, South-East Asia, and Latin America; the analysis of Australia above was already limited to a single country, and is not repeated.

Figure 21 shows results for East Asia. The level of GVC involvement as measured by this backwards looking indicator is typically high, close to 50% of the value of gross exports in some cases. In general, it is the smaller economies that have the highest degree of GVC integration, although numbers for Republic of Korea are also substantial. Interestingly, China typically has low values for the directions of trade considered here. Of course, these numbers aggregate over all sectors, so it is possible that at a fully disaggregated level, the picture would look quite different.

Figure 21. The importance of backward linkages in exports from East Asia to its FEALAC partners, by economy, 2017

(Percent of gross exports)



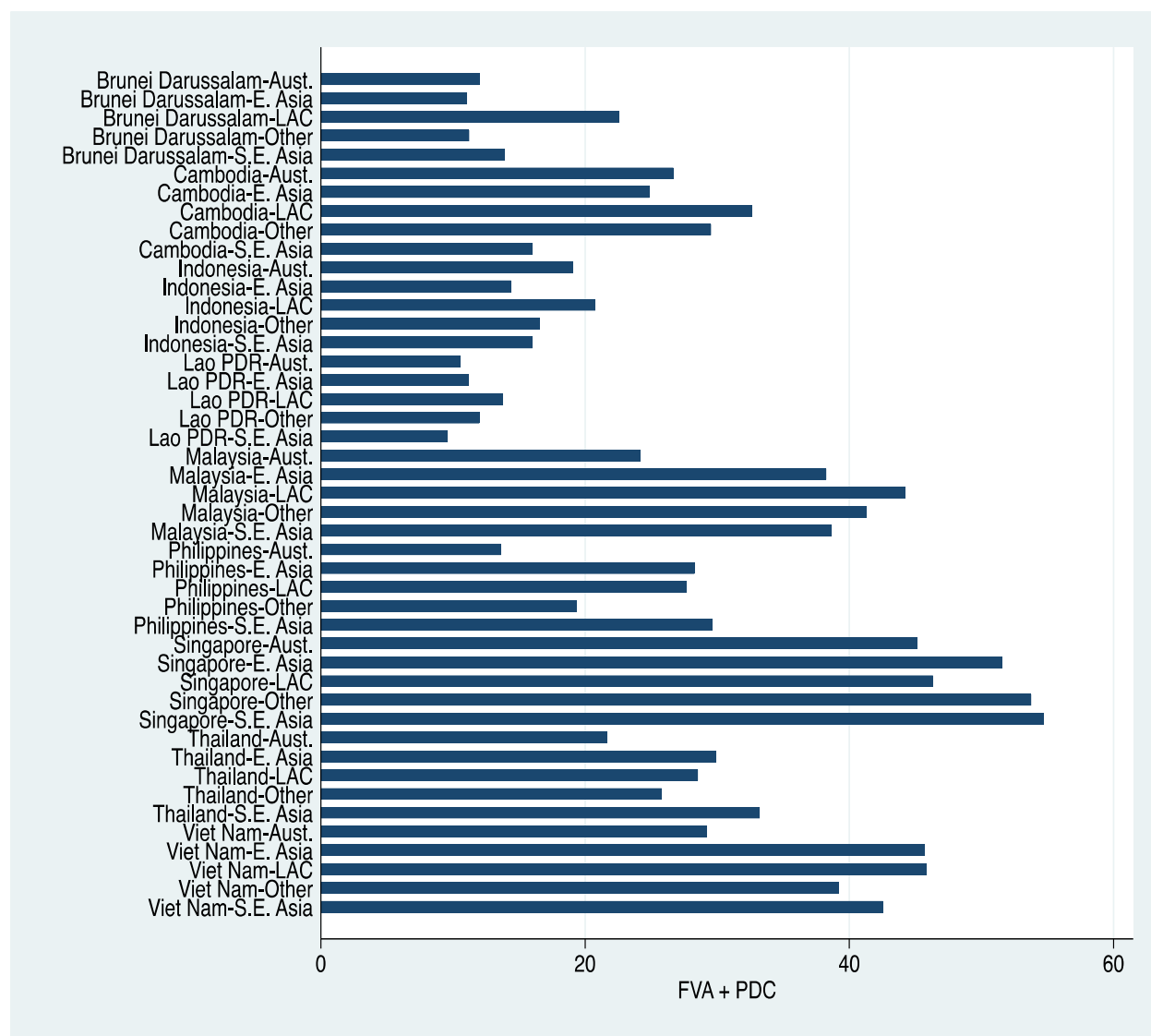
Source: ADB MRIO; and author's calculations.

South-East Asian countries and their partners are in Figure 22. On the whole, figures are indicative of a lower level of GVC integration from the backwards perspective than in East Asia, but there is substantial variation across countries. Singapore has a very high level of GVC participation, approaching 60% in some cases, while Viet Nam and Malaysia are consistently around 40%. The lower income South-East Asian countries, as well as Indonesia—a large country—have lower degrees of GVC integration. In

addition to income, an important economic characteristic that these countries share is their relative dependence on primary commodity exports.

Figure 22. The importance of backward linkages in exports from South-East Asia to its FEALAC partners, by economy, 2017

(Percent of gross exports)

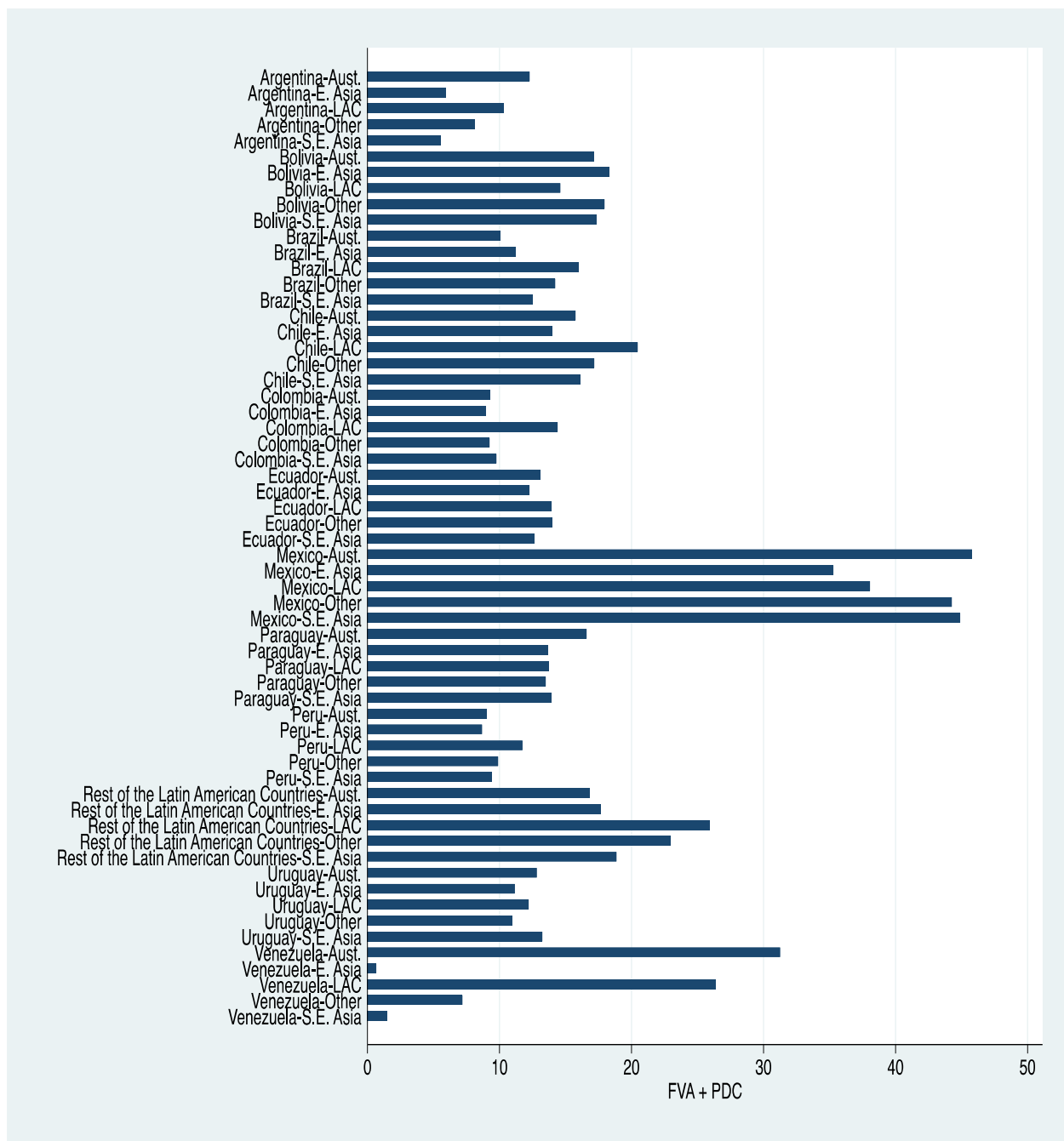


Source: ADB MRIO; and author's calculations.

Finally, figure 23 considers Latin American countries. For most countries, the level of backwards looking GVC integration is lower than in the Asian subregions. Performance across countries is more consistent than in the other regions, with the exception of Mexico. Mexico displays a level of GVC integration that is quite comparable to what is observed in East and South-East Asia, among the most integrated economies.

Figure 23. The importance of backward linkages in exports from Latin America to its FEALAC partners, by economy, 2017

(Percent of gross exports)

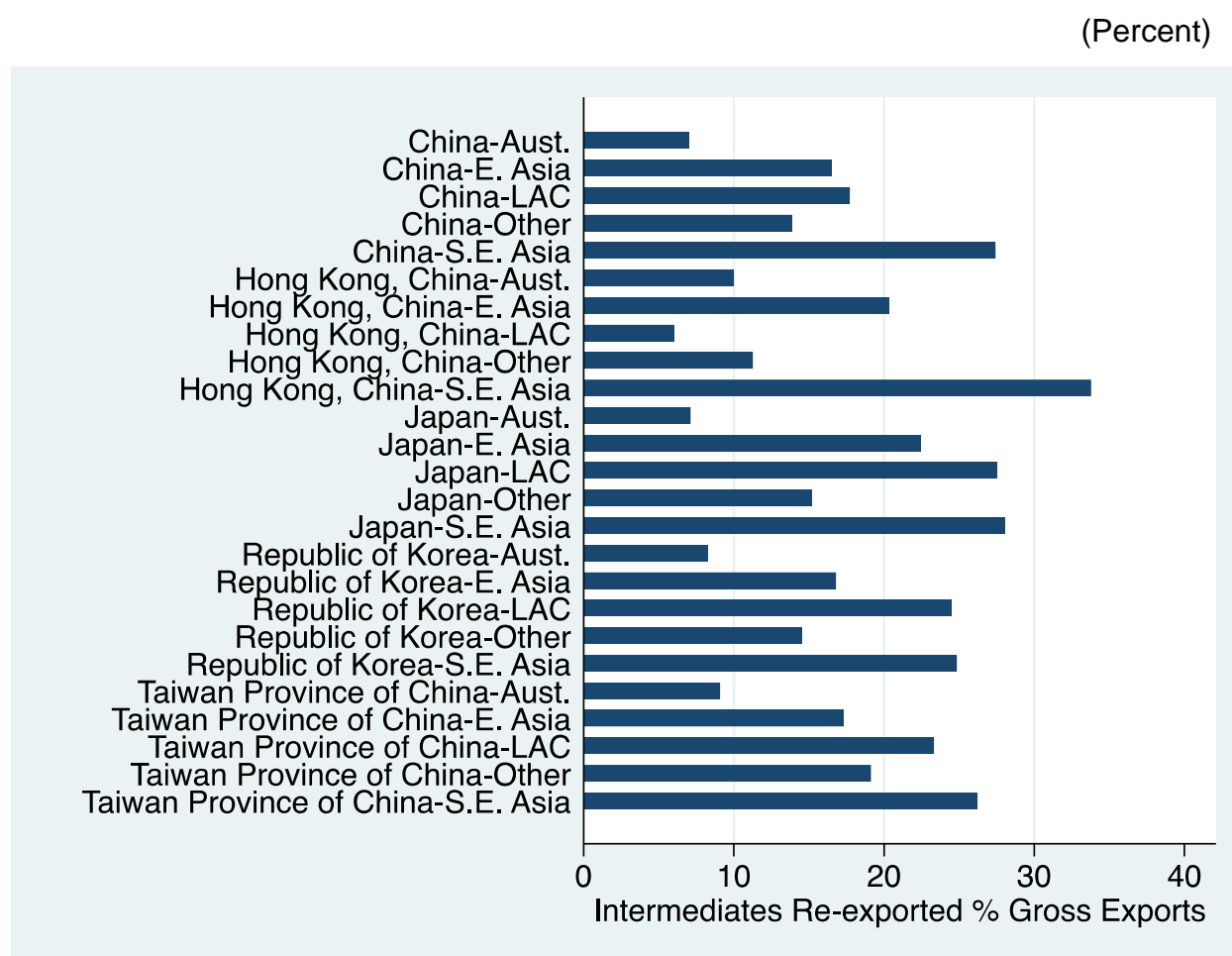


Source: ADB MRIO; and author's calculations.

As in the other parts of the analysis, it is also important to consider the forwards perspective. The metric is the same one as above, namely DVA_INTrex as a percentage of gross exports.

Figure 24 shows results for East Asia. Levels of GVC integration are again significant, and display more uniformity than with the backwards metric. While there are differences according to the direction of trade, all countries in this group play important roles as input producers supplying others' export sectors. Notably China supplies substantial inputs, in particular to South-East Asia, that are used in production of that region's exports. Indeed, input linkages from East Asian economies are particularly strong with South-East Asian economies, in most cases.

Figure 24. The share of forward-linked exports from East Asia to its FEALAC partners, by economy, 2017



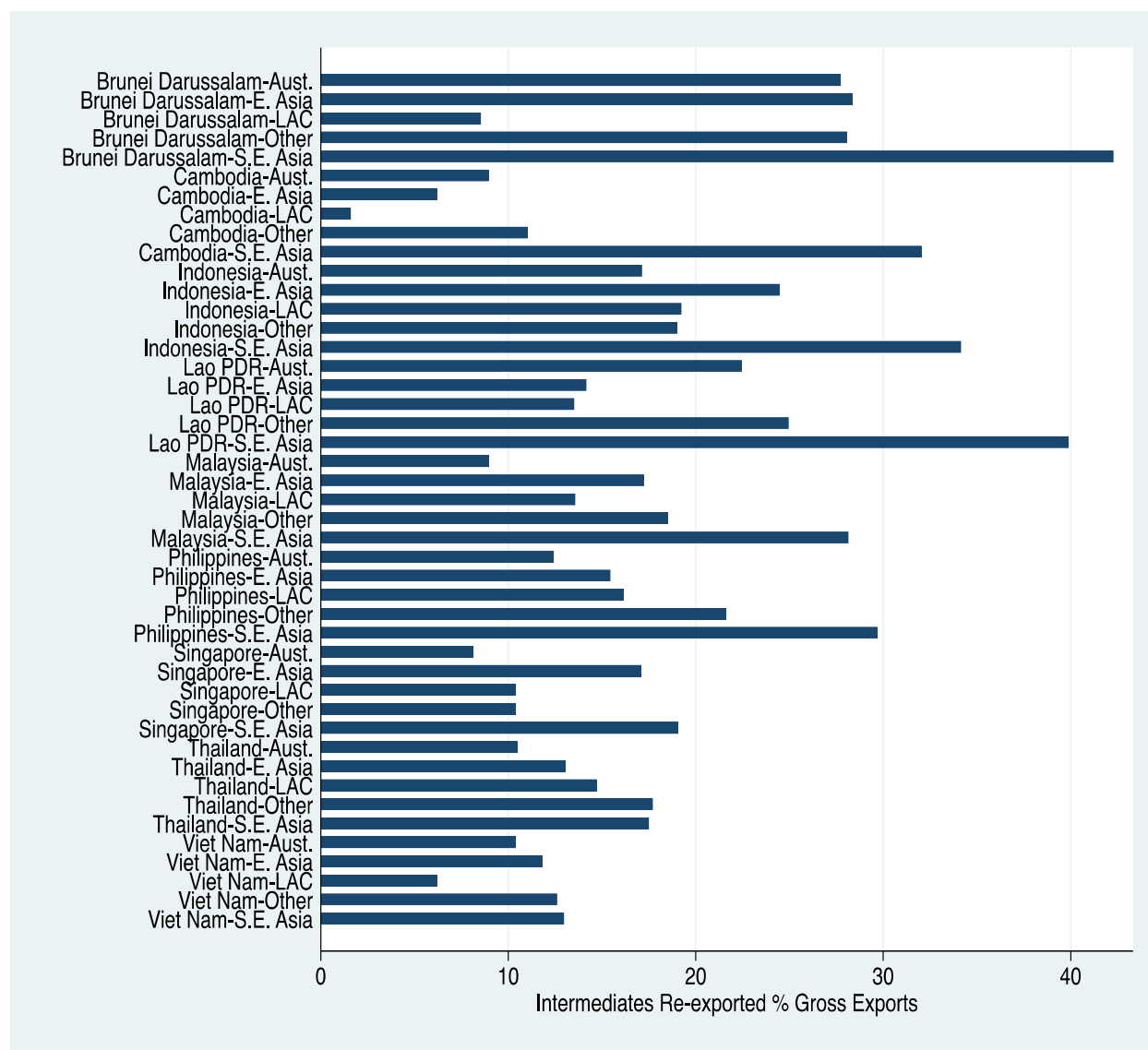
Source: ADB MRIO; and author's calculations.

Figure 25 considers South-East Asia. The degree of integration from a forward perspective is high, but there is considerable variation across countries, likely linked to sectoral patterns of specialization. For instance, Brunei Darussalam's very high level of GVC participation is likely due to its role as a supplier of fuels. In general terms, the higher income South-East Asian countries typically have lower levels of involvement,

as it can be assumed that much of the very high figures for other countries come from exports of primary products.

Figure 25. The share of forward-linked exports from South-East Asian to its FEALAC partners, by economy, 2017

(Percent)

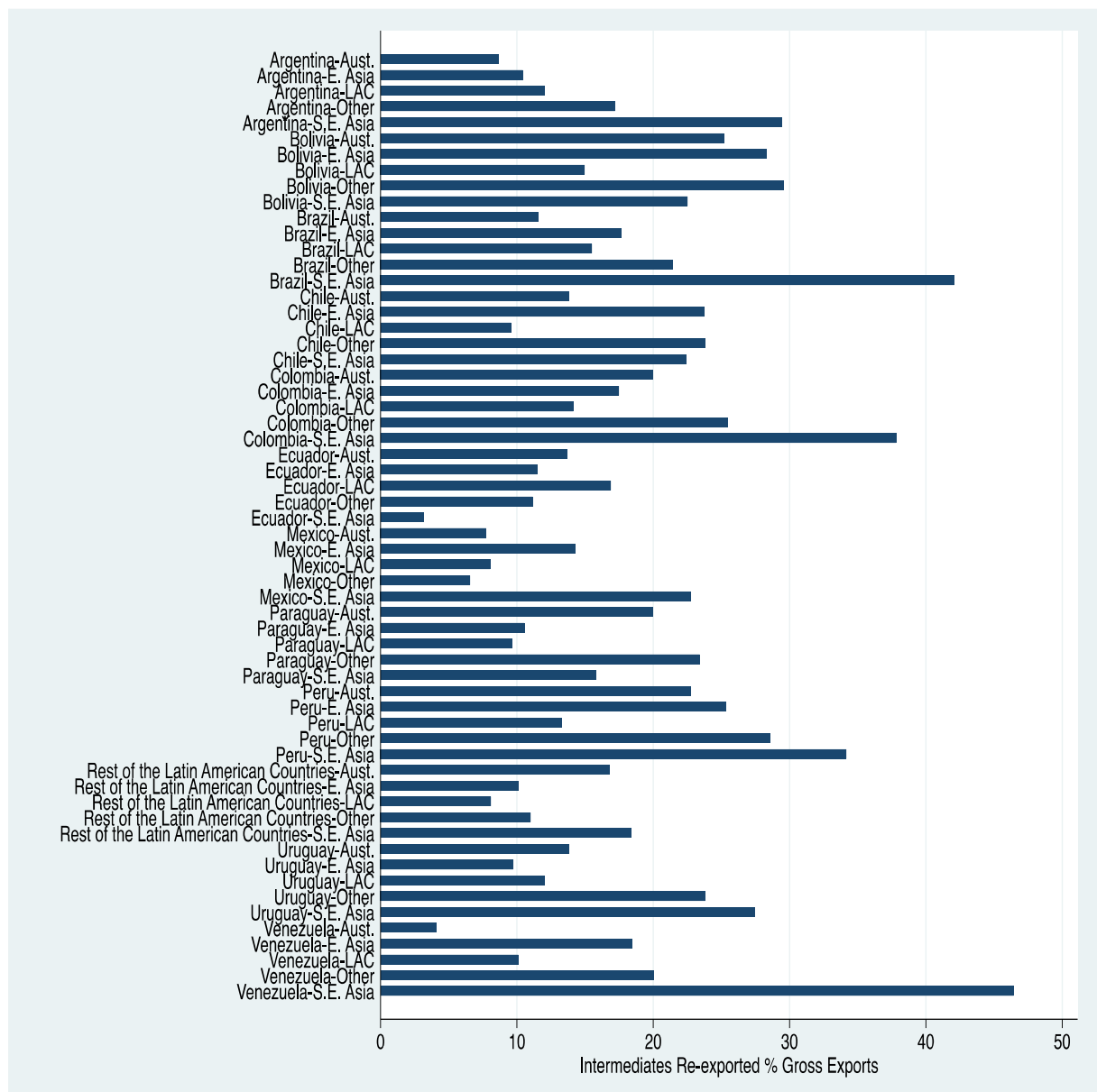


Source: ADB MRIO; and author's calculations.

Finally, figure 26 presents results for Latin American countries. Again, the role of primary products is again in evidence, with countries like Brazil and Venezuela sometimes having very high levels of GVC participation, likely due to the importance of primary commodities, including oil, in their export bundles. More generally, the level of GVC participation from this perspective is comparable to what is seen in other regions, even though individual country experiences are different.

Figure 26. The share of forward-linked exports from Latin American to its FEALAC partners, by economy, 2017

(Percent)



Source: ADB MRIO; and author's calculations.

The country analysis has shown that experiences do indeed differ within subregions. From a policy perspective, it is important to be aware not only of country characteristics per se, but also sectoral patterns of specialization that flow from them. In a general sense, backward looking GVC integration is most prevalent in East and South-East Asian countries, although with considerable variation. In Latin America, Mexico stands out as having a high degree of GVC integration through the use of imported intermediates. From the forward perspective, however, there is again cross-country

variation, but more uniformity across regions. However, sectoral specialization matters, as discussed above, as some countries perform an input supply role focused on primary products, while others are more specialized in manufactured inputs.

5. Conclusion and policy implications

This paper has provided a review of the available evidence on GVC participation among FEALAC countries. It has distinguished bilateral connections at the regional level, focusing on FEALAC member countries in Asia and Latin America. Using MRIO data as well as current best practice methodology for analyzing value added contributions to trade, a number of key conclusions flow from it.

First, and as expected within each region, countries participate in GVCs in different ways and to different extents. The patterns of their GVC participation tend to follow overall comparative advantage of the countries. Both in Asia and Latin America, there are cases of countries that effectively act as assembly hubs, relying heavily on imported intermediates to produce their exports; Mexico is an example in Latin America. While China historically played this role in East Asia, the data now suggest that it has shifted more towards the supply of manufactured intermediates. By contrast, several countries, such as Australia and a number of Latin American countries, focus on providing primary inputs, including agriculture and mining, that are transformed within value chains into outputs of different types.

Second, cross-regional linkages occur, and are economically important, but trade costs are a significant barrier to the extension of GVCs more broadly. ITC (2017) pointed out that GVC linkages tend to be strongest among geographically close countries, where trade costs tend to be lowest. This dynamic is in evidence here: while there is a very close GVC trade relationship between East Asia and South-East Asia, the connection with Latin America is noticeably weaker. For a range of possible reasons, trade costs

for East and South-East Asia to trade with Latin America are higher than trade among themselves by 42% to 171%.⁵

Third, the results presented here reinforce the important role of services both as being inputs for manufacturing GVCs and creating services value chains. The data suggest that services have become important components of GVC-related exports in many of FEALAC-member countries. For instance, approximately 40% of gross service exports of Australia, East Asia and Latin America to South-East Asia is GVC related, through forward value chain linkages. Indeed, the importance of the services linkages between Latin America and South-East Asia is worthy of further research in and of itself, as a potentially interesting dynamic for future development.

Fourth, there is evidence from sectoral data that the main cross-regional GVC linkages between FEALAC member countries in Asia and Latin America are related to Asian FEALAC countries using raw material inputs from Latin American FEALAC countries for their export production. This pattern of trade is consistent with resource endowments and likely other determinants of comparative advantage. The role of Latin American countries is somewhat similar to the role of Australia. Notably, the interregional GVC linkages with Latin America are more significant in South-East Asia than in East Asia. Across sectors, the interregional linkages are more significant in agriculture, mining, and services sectors than in manufacturing sector.

Finally, from an intra-regional perspective, GVC linkages in Latin America appear under-developed relative to East and South-East Asia. While there is clearly an important amount of GVC activity taking place within Latin America, it is not as significant as in those parts of Asia.

Taking these results together, it is clear that while geography is an important determinant of GVC spread and integration, it is not the only factor at play. For policymakers, a key consideration is the extent to which effective policies can help overcome geographical barriers. In a different context, Borchert et al. (2017) highlight the importance of services policies in this regard: efficiently regulating backbone

⁵ Trade cost estimates are obtained from the ESCAP-World Bank Trade Cost Database (July 2019 update) available at <https://artnet.unescap.org/databases#tradecost>.

sectors, in particular transport, can help reduce the trade costs associated with geographical distance.

More generally, trade policies and integration agreements along with trade facilitation measures to reduce trade costs clearly have the potential to shape GVC trade between countries and regions. East Asia and South-East Asia are linked by a system of trade agreements centered on ASEAN: potentially reducing trade costs and providing a framework of certainty in which lead firms can make relationship-specific investments in GVC development. Those agreements are likely to be consolidated in the Regional Comprehensive Economic Partnership agreement. At the same time, some of those countries, along with a range of partners, including some Latin American countries, are implementing the Comprehensive and Progressive Trans Pacific Partnership agreement. While simplification of trading arrangements through mega-regionals can potentially be welcomed, excluded countries need to be vigilant to ensure that market access conditions, including technical issues such as rules of origin, do not lead to a less than level playing field when it comes to GVC trade. There are, however, limits to the benefits of trade agreements in terms of their potential to reduce trade costs. Consequently, there is a growing need to focus on trade facilitation to further reduce trade costs (ESCAP, 2019).

Developing GVC trade among FEALAC countries in the future will clearly require greater attention to trade policy. Currently, the trade policy landscape linking East Asia and Latin America is piecemeal. While there are initiatives that could potentially provide a fillip to this relationship—such as Free Trade Agreement of Asia-Pacific, which would include all Asian and Latin American member economies of Asia-Pacific Economic Cooperation—the prospect for an agreement is still distant. In the meantime, and in the absence of an agreement, it will be important to continue dialogue in technical areas where it is possible to make incremental progress. Regulatory cooperation in areas like services, but also standards and conformance, can potentially help trade flow more freely, including GVC trade, even in the absence of comprehensive and broad-based liberalization.

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