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Participation and Benefits of SMEs in GVCs in Southeast Asia

Javier López-González, Laura Munro, Julien Gourdon,
Emanuele Mazzini and Andrea Andrenelli (OECD)

Although global value chain (GVCs) participation in Southeast Asia has been growing, little is known about whether the benefits from participation are accruing to larger firms or if small and medium sized enterprises (SMEs), which make up the majority of companies and employ the bulk of the domestic workforce, are also able to take advantage of the new opportunities on offer. This paper uses detailed firm level data from Southeast Asian countries to split the OECD Trade in Value Added database and map how SMEs have been participating in GVCs. It then identifies the benefits associated with this participation and looks into the policy levers that can help make GVC participation in the region more inclusive. It suggests that policy makers focus on: i) reducing trade costs that hit SMEs hardest; including tariffs, trade agreements and trade facilitation; ii) creating an enabling environment to promote domestic linkages so that SMEs can create partnerships with larger firms and multinationals to export indirectly; and iii) reducing non-tariff measures that are especially onerous for SMEs through wider ASEAN regulatory harmonisation and adopting more flexible rules of origin.

Keywords: Small and Medium-sized Enterprises (SMEs); Global Value Chains (GVCs); Non-Tariff Measures (NTMs); Rules of Origin (RoO); multinationals; trade in value added

JEL Codes: D22; F13; F14; F63; F68 ; L11; L25

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Key messages

Global value chains (GVC) provide new opportunities for firms. In Southeast Asia, GVCs have supported aggregate economic development, but less is known about whether small and medium sized enterprises (SMEs), that account for the majority of companies and employ the bulk of the domestic workforce, share in the benefits.

SMEs face a range of challenges, but GVCs have the potential to provide new opportunities.

SMEs have limited experience, lower productivity and less access to finance for new investment, information, skills and technology, making it harder to scale and face the costs of engaging in trade. GVCs can help SMEs access better and cheaper inputs (participation via imports) to increase their competitiveness, and offer new opportunities through specialising in producing intermediates rather than mastering all the tasks required to produce final goods (participation via exports).

But evidence shows that participation remains low. SMEs in the region import less than larger firms, suggesting they face additional constraints in sourcing inputs which affects their competitiveness. ASEAN SMEs are more specialised than larger firms in the production of intermediates sold into GVCs, but their participation remains low. Indirect exporting is also an important channel for ASEAN SMEs to internationalise, in particular in GVC intensive sectors such as electrical and transport equipment.

GVC participation is not an end in itself: higher participation is associated with higher productivity, sales, upgrading and employment. While importing SMEs in Indonesia generated more jobs for women than any other category of trading or non-trading firms, they generated even more employment for men.

Governments need to consider carefully how to help SMEs integrate into GVCs. While SME benefit from GVCs, not all will be able to participate and there can be trade-offs between inclusiveness and efficiency: tariffs or local content requirements aimed at integrating SMEs in GVCs, raise costs, and reduce competitiveness and benefits from GVC participation. Governments need to weigh net gains in employment and value generation, against greater SMEs participation.

Policy makers can focus on trade-related reforms that maximise potential gains for SMEs:

- (i) Reduce trade costs that hit SMEs hardest.*** This means *reducing tariff* so that SMEs can source inputs; *engaging in trade agreements*, which are shown to open markets for SME exports; *promoting trade facilitation reforms which* SMEs benefit more than larger firms; and *supporting the digital transformation* to cut the costs of reaching foreign customers.
- (ii) Create an enabling environment to promote domestic linkages so that SMEs can export indirectly through larger firms and multinationals.*** An enabling business environment, in particular rule of law and contract enforcement, is key and a more joint approach to trade and investment policies can help.
- (iii) Reduce non-tariff measures that are onerous for SMEs and engage in wider ASEAN moves towards regulatory harmonisation and adopt more flexible rules of origin.***

Complemented by targeted action in areas important for SME development. As GVC expansion slows and competition intensifies, governments need to help SMEs better adopt new technologies and access new skills to participate in the digital economy and the GVCs of tomorrow.

Executive summary

The fragmentation of production processes across national borders – often referred to as the global value chain (GVC) revolution – has given rise to new opportunities for firms in developed and developing countries. In Southeast Asia in particular, GVCs have played a prominent role in supporting aggregate economic development, making ASEAN countries an important pillar of 'Factory Asia'. However, to date, little is known about whether the benefits from growing GVC participation in the region are accruing to larger firms or if small and medium sized enterprises (SMEs), which make up the majority of companies and employ the bulk of the domestic workforce, are also able to take advantage of the new opportunities on offer.

The aim of this paper is to shed light on how to make the benefits from GVCs more inclusive for ASEAN countries. To this end, the paper is structured in six parts. Section 1 provides a broad introduction, motivating the analysis and identifying how SMEs can participate in GVCs. Section 2 explores the nature and evolution of SME participation in GVCs in ASEAN countries. Section 3 then identifies some of the benefits and challenges associated with SME participation. Section 4 looks at the structural and policy drivers of SME engagement with a view to identifying the policy levers that might help SMEs increase their participation. Section 5 takes a closer look at how two specific trade-related issues – non-tariff measures (NTMs) and rules of origin (RoO) – affect SME participation in GVCs. Finally, Section 6 investigates the trade and investment linkages that take place between SMEs and multinational enterprises (MNEs).

The main findings of this report are as follows.

Although SMEs make up the majority of enterprises in the region, their contribution to trade remains limited...

The share of firms that export, whether intermediates or final products, is lower for SMEs (13% in Indonesia, 8% in Viet Nam and 5% in Thailand) than for large firms (50%, 69% and 55%, respectively). Similarly, for imports, only 19% of SMEs in Indonesia, 14% in Viet Nam and 6% in Thailand import, compared with, 44%, 71% and 49% respectively of large firms. This suggests that many SMEs may be missing out on the benefits associated with trade and participation in GVCs.

This is because SMEs tend to be less productive and face a range of challenges...

SMEs are constrained by their lower productivity and limited experience which reduces their ability to scale, and access to international markets, finance for new investment, information, skills and technology. This makes it more difficult for them to face the costs of engaging in trade.

GVCs have the potential to provide new opportunities for ASEAN SMEs...

Changes in the global trading landscape, arising, amongst others, from the rise in global value chains (GVCs), offer new channels through which some of these constraints can be relaxed, giving SMEs new opportunities to integrate into the global economy.

For instance, access to more sophisticated and competitively priced inputs from abroad (participation in GVCs via imports), can help SMEs increase their competitiveness. In turn, the fragmentation of production should enable SMEs to integrate into GVCs by allowing them to specialise in the production of intermediates rather than having to master all the tasks required to produce final goods (participation in GVCs via exports).

But evidence shows that SMEs in the region have low participation

- ***SMEs in the region tend to import less than larger firms.*** For instance, the foreign value added content of export of SMEs in Thailand was 36% while that of larger firms was 53%. This suggests that SMEs might face additional constraints limiting their ability to source foreign inputs, affecting their competitiveness.
- ***ASEAN SMEs tend to be more specialised than larger firms in the production of intermediates sold into GVCs (but their participation through this channel remains low).*** For example, in Singapore, 33% of SME exports are sold as intermediates to other countries to produce exports while the corresponding figure for large firms is 15%. While differences are less pronounced in other countries, this suggests that the evolving environment of growing trade in intermediates provides new opportunities for internationalisation.
- ***Indirect exporting represents an important channel through which ASEAN SMEs internationalise.*** In Viet Nam, SMEs export more than twice as much through larger firms than they do directly. The evidence also shows that indirect exporting is most prevalent in GVC intensive sectors such as electrical equipment and transport equipment.

GVC participation is not an end in itself: higher participation is associated with higher productivity, sales, upgrading and employment

Empirical analysis underscores that there are many potential benefits for SMEs that integrate into GVCs in ASEAN. Imports, for instance, are associated with growth in trade and domestic sales, higher total factor productivity and higher rates of upgrading. In turn, GVC participation through direct exports is associated with productivity growth and upgrading, although the direction of causation is hard to establish. Moreover, greater participation is also linked to employment generation. However, evidence from Indonesia suggests that the benefits are not always shared equally across genders. While importing SMEs generated more jobs for women than any other category of trading or non-trading firms, they generated even more employment for men.

Governments need to consider carefully how to help SMEs integrate into GVCs

Although there are clear benefits from SME participation in GVCs, not all SMEs will be able to participate. SMEs are highly heterogeneous, not just in terms of their size, age and sector of activity, but also in terms of their willingness and ability to grow and engage in GVCs. There is a role for policy to support those SMEs which want to grow by helping them overcome some of the challenges associated with participation. In particular, policy intervention can usefully focus on market failures such as informational asymmetries, which can provide a preferential business environment for large firms relative to SMEs.

There are, however, some difficult questions about which objectives to pursue, given that there can be trade-offs between efficiency and inclusiveness. For instance, trade policies such as higher tariffs or local content requirements might be used with the intention of stimulating domestic sourcing with a view to integrating SMEs in value chains. However, forcing firms to source more expensive intermediate products than their competitors will entail losses in overall competitiveness, reducing the benefits associated with GVC participation through imports in the first place. This means that governments may need to weigh the gains associated with greater competitiveness arising from further GVC participation, in terms of net employment and value generation, against the gains from redistribution, in terms of more SMEs participating in value chains.

Policy makers can usefully focus on the following trade-related policy interventions to maximise the potential gains from GVCs for their SMEs:

Reduce trade costs. Trade costs hit SMEs hardest, reducing their ability to gain competitiveness through imports and to benefit from GVCs by exporting intermediates. *Reducing tariffs at home*, especially on inputs, so that SMEs are better able to source intermediates, is key. So too is *engaging in trade agreements*, which are shown to open markets for SME exports. Another key priority action area is *trade facilitation reform*. More efficient customs procedures help large and small firms integrate into GVCs, but they help SMEs more. This means that trade facilitation reforms promote overall efficiency and also level the playing field between small and large firms. Finally, efforts to support *the digital transformation* also promise particular benefits for SMEs by reducing the costs of reaching foreign customers.

Create an enabling environment to promote domestic linkages to help SMEs export indirectly. Indirect exporting is a key channel for SMEs to internationalise, particularly in sectors that tend to be strongly associated with GVC activity. Promoting the creation of domestic linkages, connecting SMEs with larger firms and multinationals, can help increase their indirect exports. Expansion of these already significant linkages depends on governments creating an enabling domestic business environment, in particular the rule of law and enforcement of contracts. A more joint approach to trade and investment policies will also help promote SME-MNE linkages.

Reduce non-tariff measures and engage in wider ASEAN moves towards regulatory harmonisation. While tariffs have fallen considerably in the region, the number of non-tariff measures (NTMs) has grown rapidly – from 1 634 measures in 2000 to 5 975 measures in 2015. Lacking the resources to comply or adapt production to different requirements, NTMs can be particularly onerous for SMEs. While, compliance with regulations and standards can help SMEs signal quality, thereby stimulating demand, other NTMs and regulatory heterogeneity (which has a strong and SME-specific negative impact) reduce the ability of SMEs to integrate into GVCs through export, and constrain their ability to source intermediates from abroad. Moves towards further regulatory harmonisation within ASEAN could ease these constraints.

Simplify Rules of Origin (RoO) by adopting more flexible rules. Although RoO are designed to prevent products from non-member countries entering a free trade area, their complexity and divergence across agreements inflate the costs of compliance and impede SME participation in GVCs. The adoption of more flexible rules of origin will help ASEAN SMEs draw benefits from further integration into regional value chains.

These interventions complement more targeted action in areas important for SME development

The pace of GVC expansion is slowing, in part, due to changes in demand and the transformation of business models as a result of digitalisation. For SMEs seeking to profit from GVCs, this means that international competition is intensifying, underscoring the importance of acting to reduce the costs of trading and the opportunities for participation through continuing openness to trade and investment. But these policies need to be leveraged in the context of wider regional and domestic reforms, aimed at helping SMEs better adopt new technologies and access new skills to enable their participation in the digital economy and the GVCs of tomorrow.

1. Why GVCs and SMEs?

This introductory section explores the different channels through which SMEs participate and benefit from GVCs. It argues that growing GVC participation has the potential to offer firms of all sizes new opportunities to benefit. For example, access to cheaper and more sophisticated intermediate imports can help SMEs become more competitive. The ability to integrate into segments of global production, rather than having to master all the tasks required to produce a final good, also provides new pathways for SME internationalisation. However, not all SMEs will benefit. SMEs are highly heterogeneous, not just in terms of their size, age and sector of activity, but also in terms of their willingness and ability to grow and engage in GVCs. A role for policy emerges to help SMEs that want to grow but are unable to do so due to inefficiencies or market failures. However, approaches will need to consider how best to balance inclusiveness and efficiency.

1.1. Introduction

Small and medium-sized enterprises (SMEs)¹ are the main form of enterprise across the globe, acting as important sources of economic activity and employment (WTO, 2016 and De Kok et al., 2011).² SMEs may also support economic inclusiveness – through, for example, promoting greater participation of women in the workforce (ITC, 2015; ADB, 2015).

However, SMEs also tend to be less productive and less innovative than large firms, which is why they tend to contribute less to value added (GDP) and exports (WTO, 2016). This is also the case in Southeast Asia where the majority of enterprises are SMEs (92-99%) and they employ the bulk of the domestic work force (58-91%); yet they represent only about a third of total value added (GDP) or exports (Lopez-Gonzalez, 2017).³

The shortfall is associated with SMEs having lower productivity as a result of their smaller-size and limited experience reducing access to scale, international markets, finance for new investment, information, skills and technology (see ITC, 2016 and WTO, 2016 for recent reviews). However, changes in the global trading landscape, arising, amongst others, from the rise in global value chains (GVCs), may offer new channels through which some of these constraints can be relaxed, giving SMEs new opportunities to integrate into the global economy.

This introductory section identifies the potential opportunities that GVCs offer SMEs and discusses the different channels through which SMEs participate. It then asks why governments

¹ The definition of SMEs varies across countries reflecting diverse economic circumstances or fiscal realities. According to the OECD and the EU, an SME is a firm with less than 250 employees. In the US an SME is defined as a firm with less than 500 employees. In Southeast Asia the definition varies across country. For instance, Indonesia uses turnover or net assets to categorise firms by size. Thailand uses a combination of employment and turnover with different cut-offs across sectors of activity (e.g. lower employment limits for wholesale and retail). For the purposes of comparability, the analysis in this project defines SMEs as firms with less than 200 employees.

² According to the WTO (2016), most firms are classified as SMEs in every country - particularly when informal firms are taken into account. Firms with fewer than 100 employees account for one half of formal private sector employment in developing countries and emerging economies (De Kok et al., 2011).

³ In OECD countries, SMEs represent 95% of all firms and approximately two-thirds of employment but their contribution to GDP (around half) and exports (20-40%) is somewhat larger (OECD, 2017a).

might want to focus on SMEs and why Southeast Asia is a good place to study SME participation. The last section provides a brief overview of the project scope and objectives.

1.1. What opportunities can GVCs provide for SMEs?

Global value chains are re-shaping the global economic landscape and providing new opportunities for firms, including SMEs, to grow (OECD, 2013). Indeed, participation in GVCs is associated with economic development, whether through productivity growth or the production of more sophisticated or diversified exports (Kowalski et al., 2015). However, it is unclear whether these benefits accrue only to larger firms or multinationals, or if SMEs, which tend to employ the largest share of the population, are also able to benefit from the opportunities offered by the evolving landscape.

In view of making the benefits from GVC participation more inclusive, it is worth exploring what new opportunities GVCs provide for SMEs and what barriers may impede their participation. To tackle this issue, one first must understand (i) what GVCs are; (ii) the channels through which SMEs participate in GVCs; and (iii) why it is desirable to promote further SMEs integration into GVCs.

1.1.1. What are GVCs?

In recent decades, production has increasingly fragmented across national borders through GVCs (OECD, 2013). Firms can now participate in the production of a final good by specialising in different 'tasks' or processes such as farming, extraction of natural resources, research and development, manufacturing, design, management, marketing, distribution or post-sale services. Today, these tasks take place in a variety of countries and involve firms of different sizes. These firms participate in GVCs by directly trading goods or services across borders, or simply by being linked to such activities through the process of value creation (Kowalski et al., 2015).

Activities along a value chain are performed by firms which can be independent economic actors or subsidiaries (e.g. through FDI).⁴ Lead firms often divide the work and responsibilities across different segments, while others follow the terms set by the lead firms (e.g. buyer-driven chains in textiles and clothing, see Gereffi and Fernandez-Stark, 2011). The type of engagement is often determined by the nature of the value creation process itself; e.g. performing a stage in a sequential production process or the assembly of components from multiple sources (see the concept of “spiders” and “snakes” in Baldwin and Venables, 2013). Depending on the type of product and geographical location of activities, some value chains will be regional and some will have a truly global nature (Kowalski et al., 2015).

For purposes of measurement, and in the context of trade, GVC participation often refers to using intermediate products from, and/or selling intermediate products to, foreign partners. Indeed, a defining feature of the evolving environment is the importance of intermediate goods and services which now make up over 70% of global trade (OECD, 2013). Indicators of GVC participation tend to be derived from inter-country-input-output (ICIO) tables such as those that underpin the OECD-WTO Trade in Value Added (TiVA) database or the World Input-Output Database (WIOD) – See Box 1. These allow the identification of the origin and destination of the value added embodied in exports.

⁴ Often depending on ownership structures and costs of coordination as well as issues related to contract enforcement (see Gereffi and Fernandez-Stark, 2011).

Box 1. Trade in Value Added (TiVA) Database

The flows of goods and services within global value chains are not always reflected in conventional trade statistics. For example, gross export flows ascribe the entire value of a product to the exporting country, not taking into account that this product is composed of intermediate inputs from many other countries. A salient example is the case of the iPhone. Kraemer et al. (2011) found that Chinese value added in an iPhone amounted to 5% of its pre-sale value. This implies that for every 1 dollar worth of iPhone exports, only five cents originate in China, the rest is either intermediate inputs from other countries or Apple revenue. Gross trade statistics do not capture the value added embodied in products and may therefore inflate the value of particular exports.

The joint OECD–WTO Trade in Value-Added (TiVA) initiative addresses this issue by considering the value added by each country in the production of goods and services that are consumed worldwide. TiVA indicators are designed to better inform policy makers by providing new insights into the commercial relations between nations. The database (2018 revision) covers 63 economies – including 8 ASEAN members – and 34 unique industrial sectors up to 2013, offering new insights into evolving globalisation and providing a basis for identifying policy implications.

Indicators of participation in GVCs can either be backward or forward looking. Considering a reference country, *backward participation* is when foreign value added (imports) is embodied in the country's exports, often referred to as the buying element of GVCs or importing within GVCs. *Forward participation* is when domestic value added is used as inputs to produce exports in another country – the selling or exporting element of GVCs. However, firms can also engage in GVCs by importing to produce (I2P) for the domestic market (Baldwin and Lopez-Gonzalez, 2015). That is, firms can use intermediate imports in a production process but do not necessarily have to export to be involved in a GVC (see also Los et al., 2015; Kowalski et al., 2015).

A set of conditioning observations emerge from GVC analysis based on ICIO tables. The first is that participation in GVCs has been growing, especially in emerging countries and particularly in Southeast Asia (see Box 2 and Baldwin and Lopez-Gonzalez, 2015, Kowalski et al., 2015, Taglioni and Wrinkler, 2016 and World Bank et al., 2017) – although more recent evidence suggests that this growth is slowing down and in some instances reversing (OECD, 2019). The second is that the aggregate type of engagement, whether forward or backward, depends on the dominant sector of activity within the economy. That is, countries which tend to specialise in services tend to have strong forward participation rates because services feed into many other sectors as intermediates, a phenomenon known as ‘servicification’ (see Kommerskollegium, 2012 and Miroudot and Cadestin, 2017). By contrast, countries specialising in the production of manufactured goods tend to exhibit stronger backward participation rates reflecting the strong sourcing element of manufacturing activities. Lastly, while value chains are often described as global, many are actually regional, highlighting that distance, and regional integration, might be important drivers of participation (Baldwin and Lopez-Gonzalez, 2015).

Box 2. GVCs in ASEAN

In ASEAN, GVC participation is growing, the share of foreign value added (imports) used to produce exports (the buying element of GVCs) increased from 29% to 33% in the period 1995 to 2011, allowing ASEAN countries to develop their competitiveness as exporters. At the same time, the origin of this value added is changing: increasingly, firms in ASEAN are turning to source competitive inputs from intra-regional and neighbouring Asian partners, replacing more traditional sources such as the European Union and the United States.

In the region, natural resource rich economies such as Indonesia and Brunei Darussalam are predominantly engaged in sales of raw materials into value chains, while Malaysia, Thailand, the Philippines and Viet Nam

have a stronger manufacturing element to their participation, and Singapore is engaged in the sale of high-skill intensive products and services.

Participation in GVCs also supports domestic job creation and sustains jobs abroad. For instance, in ASEAN, over 76 million domestic jobs are linked to the production of exports. ASEAN exports also sustain over 14 million export jobs abroad. More than a third of these (4.7 million) are located in China, over 4.4 million in other ASEAN countries and the remaining (more than 4 million) mainly in India (2.5 million), the EU (600 000), Japan (400 000), North America and Mexico (370 000), Korea (140 000) and Australia and New Zealand (100 000). Rising job interdependencies through GVCs means that there are increasingly shared interests in the success of other countries' exports.

Source: Lopez-Gonzalez, 2016.

1.1.2. How can SMEs participate in GVCs?

The shift from trade in goods to *trade in tasks* (Grossman and Rossi-Hansberg, 2008) enables firms to increasingly specialise and integrate into segments of global production rather than having to master all the tasks required to produce a final good (Stamm, 2004; Baldwin, 2012; OECD, 2013; Escaith, 2014). This may be particularly relevant for SMEs that often lack the scale and economic capacity to bring a product to market from conception to final delivery (OECD-WBG, 2015). New opportunities may also arise more frequently for SMEs in emerging economies where GVC participation has grown most (Baldwin and Lopez-Gonzalez, 2015).

SMEs participate in GVCs through two main channels: inputs and outputs (Figure 1). On the input side, SMEs may participate through access to more sophisticated, cheaper intermediate *imports* (backward participation). Imports are an important, and often neglected, channel for drawing benefits from GVC participation, helping firms develop export capacity and increase productivity (Bas and Straus-Khan, 2013 and Lopez-Gonzalez, 2017). SMEs may also benefit from GVCs through other input channels such as positive spillovers from foreign investment or domestically established multinationals (OECD-UNIDO, 2019)

Figure 1. Framework for analysing SME participation in GVCs

Source: Adapted from Lopez-Gonzalez (2017).

On the output side, SMEs may participate by exporting intermediate goods either directly, to foreign suppliers (forward participation), or indirectly to domestic firms which then export (indirect exporting). As production fragments, smaller firms have more opportunities to specialise in specific intermediate goods that compose a final product rather than having to compete internationally selling finished goods. They can export these directly to firms abroad or channel inputs through firms located in the domestic territory. Such indirect exporting may be easier for SMEs, allowing these to share some of the fixed costs associated with exporting directly, including those related to meeting standards. Finally, SMEs may also engage on the output side by investing abroad through FDI, a facet of engagement investigated in more depth in parallel work being undertaken in OECD-UNIDO (2019).

1.2. Is there a role for policy to support SME integration in GVCs?

Although it is widely accepted that firms of all sizes can benefit from trade and that GVCs can provide new pathways for internationalisation, not all SMEs will benefit. SMEs are highly heterogeneous, not just in terms of their size, age and sector of activity, but also in terms of their willingness and ability to grow and engage in GVCs. Most SMEs have a relatively low performance, often due to limited aspirations (Hurst and Pugsley, 2011). At the other extreme, a small proportion of SMEs are high-growth firms – or ‘gazelles’ – driving positive trends within the category (Nightingale and Coad, 2013; WTO, 2016). However, there are also many SMEs that want to grow but are unable to do so due to constraints related to: i) inefficiencies within the firm, such as the inability to adopt or access new technologies, access skilled labour or engage in R&D; and ii) market failures.

There is a role for policy to support those SMEs which want to grow by helping them overcome some of these challenges (ITC, 2015). In particular, policy intervention can usefully focus on market failures, as the misallocation of resources can provide a preferential business environment for large firms relative to SMEs. Such imbalances are particularly frequent in developing countries. For instance, access to credit tends to be more limited for SMEs due to asymmetric information and insufficient collateral. Trade costs, which tend to represent a higher share of the value of the shipped product, tend also to be more burdensome for smaller firms. Competition policy may also favour large incumbents (for example, by restricting new entrants), and may, in some instances, need to be reformed to level the playing field (WTO, 2016).

From a policy perspective, the challenge is to design policy interventions that do not replace market failures with government failures (Low and Tijaja, 2014). For instance, competing government objectives may disadvantage SMEs. In some developing countries, preferential treatment of state-owned firms - in terms of access to credit and land – may discriminate against SMEs as well as large firms in the private sector (CIEM, 2017 and Baccini et al., 2017).

There are also some difficult questions about the objectives governments pursue. Many might justify policies to increase SME participation in GVCs in view of increasing overall employment. However, there is mixed evidence on the importance of SMEs as net job creators (Rijkers et al., 2013 and Nightingale and Coad, 2013) and the salaries SMEs pay, and benefits they offer employees, can be lower than those of larger firms.⁵ As a result of higher entry and exit rates

⁵ Rijkers et al. (2013) suggest that “SME promotion programs [...] are predicated on the notion that small firms generate the most jobs, even though empirical evidence for this proposition is scanty at best”. Nightingale and Coad (2013) add that “entrepreneurs create 3.5 million of the 2.5 million jobs created in the US economy”.

relative to larger firms, jobs in SMEs may also be less stable (Nightingale and Coad, 2013; and WTO, 2016).

There might also be a trade-off between efficiency and inclusiveness when promoting further SME engagement in GVCs. For instance, trade policies such as tariffs or local content requirements might be used with the intention of stimulating domestic sourcing in view of integrating SMEs in value chains. However, this might come at the cost of reducing overall competitiveness. By forcing firms to source more expensive intermediate products than their competitors, losses in competitiveness might arise reducing the benefits associated with GVC participation in the first place. This means that governments may need to weigh the gains associated to greater competitiveness arising from further participation, in terms of net employment and value generation, against the gains from redistribution, in terms of more SMEs participating in value chains.

But there are policies that might deliver greater SME participation without efficiency costs. For example, recent evidence shows that improvements in the trade facilitation environment increase the ability of SMEs to handle the fixed and variable costs associated with crossing the border, helping SMEs export and import (Lopez-Gonzalez and Sorescu, 2019). The benefits of reform are also found to be larger for smaller firms relative to larger firms, meaning that trade facilitation can lead to efficiency gains and also help level the playing field between large and small firms.

By promoting efficiency enhancing policies most likely to affect smaller firm competitiveness, such as skills or access to credit, or by targeting trade costs, which tend to affect SMEs most, governments may ensure that SMEs operate in an environment most conducive to greater benefits from GVC integration.

1.3. Why the ASEAN region?

Southeast Asia's success as a global production hub (see Box 2 and ERIA, 2017 and Lopez-Gonzalez, 2016) and the prominence of its SMEs offers a valuable opportunity for exploring SME participation in GVCs.⁶ There is also considerable political impetus for the promotion of further GVC participation as seen from the ASEAN Strategic Action Plan for SME Development (2016-2025). One priority action of the Plan is for SMEs to “seamlessly integrate with the ASEAN Economic Community (AEC) and the regional value chains”, during the first five years of implementation, and later, “to become globally competitive, innovative, inclusive and resilient” (ASEC, 2015). To this end, the Plan sets out specific actions to support SME participation, including to (i) “increase information on regional and global market access and opportunities; (ii) promote partnership with MNCs/large enterprises to increase market access and opportunities; (iii) enhance the use of e-commerce; (iv) promote adoption of international standards of quality to facilitate market access; and (v) establish mechanisms to assist in increasing exports” (ASEC, 2015).

These objectives are also highlighted in the ASEAN Blueprint 2025 and assigned specific deliverables in the ASEAN GVC Work Plan (ASEAN, 2016) which makes explicit reference to making GVCs more inclusive by promoting further SME engagement, also requesting further

⁶ It should be kept in mind that ASEAN member states define SMEs using different criteria. Indonesia, for example, uses turnover or net assets only. Others use a combination of employment and turnover and some, such as Thailand, have different definitions across sectors of activity (with, for example, lower employment limits for wholesale and retail). While most differentiate among micro, small and medium sized enterprises, Singapore, in its definition, does not and Thailand only distinguishes small and medium sized firms (Lopez-Gonzalez, 2017).

analysis on ways of linking SMEs to GVCs. SME participation in GVCs has also been reinforced by other high-level regional events and plans. For instance, under the Philippines Chairmanship of ASEAN in 2017, the ASEAN Economic Ministers Statement proposed SME integration in global value chains as a critical pathway to achieving the region's objective of "inclusive, innovation-led growth" (ASEAN, 2017).

Lastly, the spectrum of experience within Southeast Asia is an important case in terms of the diverse lessons it can offer to other regions. Southeast Asian countries include a range of levels of economic development, including natural resource-rich economies such as Indonesia, manufacturing strongholds such as Viet Nam, Thailand and Malaysia and service specialists such as Singapore.

1.4. Project objective and methodological approach

In view of the potential importance of GVCs for SMEs, this project aims to explore the opportunities for – and potential benefits and challenges of – SME participation in GVCs in Southeast Asia. To strengthen the evidence base and identify how policy makers can help SMEs make the most out of the evolving GVC environment, this project digs deeper into the following specific issues of importance to SMEs.

- Section 2 maps the nature and evolution of SME participation in a selection of Southeast Asian countries.
- Section 3 explores the potential benefits and challenges of participation, exploring how these vary according to the channel of participation: imports and direct and indirect exports.
- Section 4 unpacks the range of firm characteristics and policies that may determine SME participation across these different channels of participation.
- Section 5 takes an in-depth look at two trade-policy areas of particular importance – non tariff measures and rules of origin, exploring the extent to which these policies affect SME participation and benefits.
- Section 6 then investigates trade and investment linkages that take place between SMEs and MNEs.

1.4.1. Methodological approach

This project combines three methodological approaches: (i) a comprehensive literature review; (ii) a quantitative analysis; and (iii) an enterprise survey on policy barriers in Thailand. By combining diverse data sources and methodological approaches, this project aims to validate key findings and provide a more comprehensive picture of issues that are more difficult to untangle through econometrics alone.

An extensive *literature review* is first undertaken to provide the foundation and motivation for the empirical analysis of SME participation in GVCs. An in-depth review of related research on internationalisation, exports, imports, GVCs, SMEs and firm behaviour informs the conceptual framework and methodological approach of the project.

A *quantitative analysis* then tests predictions identified in the conceptual framework. Traditional GVC analyses of the Southeast Asian case do not distinguish GVC engagement by firm size or by ownership structures and thus cannot identify linkages between local firms and multinational firms in the domestic economy. This gap in the literature is tackled by triangulating trends across diverse data sources and methods. Data sources include (i) the Trade in Value Added (TiVA)

database (Box 3), (ii) firm-level data from individual ASEAN countries (see Annex B), (iii) the World Bank Enterprise Survey and (iv) policy variables at the sector or country level from a range of sources (Annex C). These datasets are combined in (i) a meso-level analysis for four ASEAN countries (Annex B) and (ii) a micro-level analysis for firms in Indonesia. The quantitative analysis for this project aims to be as comprehensive as possible, but has been adapted to account for constraints faced in data availability for certain countries, sectors and variables. In particular, the analysis focuses primarily on SME engagement in manufacturing sectors in view of wider data availability. A more limited analysis of service sectors was also undertaken. Moreover, in relying on firm-level datasets, the analysis is limited to firms in the formal sector.

Lastly an *enterprise survey on policy issues* was conducted in Thailand to verify and elaborate on findings in the quantitative analysis and literature review. As existing firm-level surveys include limited information on policy constraints, the abovementioned quantitative analysis relies on aggregated policy variables at the sector or country level. The OECD-UNIDO Thai Enterprise Survey (hereafter referred to as the Thai Enterprise Survey) aims to complement the quantitative analysis and provide further insights on how policies affect SME participation in GVCs. In particular, detailed questions try to unpack why firms participate (or do not participate) through (i) imports and (ii) exports (direct and indirect). The survey also explores how SMEs have benefited from engagement with suppliers and buyers locally and overseas.⁷

Responses to the Thai Enterprise Survey were collected from 300 firms in Thailand in summer 2018 through face-to-face interviews by a survey management company. The sample of firms includes coverage of five sectors with strong GVC potential for SMEs: (i) food products and beverages; (ii) textiles and garments; (iii) basic and fabricated metals; (iv) machinery, motor vehicles and other transport equipment; and (v) business services (computer, R&D, engineering, legal, advertising, etc.). In addition to sectoral coverage, the sample was selected to ensure sufficient diversity across firms' export status; foreign ownership levels; and location. As budgetary constraints did not allow for a representative survey of Thailand, these key sampling parameters were established to ensure a diverse sample and target firms that may be interested in GVC participation. Descriptive statistics on surveyed firms can be found in Table D.1 of Annex D.

⁷ A copy of the survey can be provided upon request.

2. How are SMEs participating in GVCs in Southeast Asia?

This section maps the nature and evolution of SME participation in GVCs. It shows that, in Southeast Asia, SMEs use less imports in trade and production than larger firms. This suggests that there might be constraints limiting their ability to source competitively priced intermediates from abroad, in turn, affecting their competitiveness. The analysis also reveals that, although SMEs in the region are more specialised than larger firms in directly exporting intermediates traded in global value chains, their direct participation remains low. Finally, the analysis highlights that an important pathway for SME internationalisation is through indirect exports, or selling intermediate goods to local firms for further export. These conditioning facts set the scene for the analysis undertaken in subsequent sections.

2.1. Introduction

GVC participation in Southeast Asia, although varied, has been growing (Figure 2). The buying element of GVCs, or the import content of exports (backward participation), increased in Thailand, Viet Nam, Cambodia and Brunei Darussalam. But it is the selling element of GVCs, exporting for the production of exports to third countries (forward participation) which has witnessed growth across all countries except Viet Nam. As participation continues to grow, ASEAN is becoming a dynamic regional hub and a pillar of the global production system (see also Lopez-Gonzalez, 2016).

Figure 2. GVC Participation in ASEAN (2013)

Source: Own calculations using OECD TiVA 2018.

However, due to a lack of data, little is known about how this growing participation is distributed across firms of different size. By combining firm-level data from Indonesia, Singapore, Thailand and Viet Nam with data from the OECD-TiVA database (Box 3), this section provides a portrait of the nature and evolution of SME participation in GVCs looking first at the aggregate level and then across manufacturing and services sectors.

Box 3. Identifying SME participation in GVCs in ASEAN

To identify SME participation in GVCs two sets of data are needed. The first is comprehensive and representative firm-level data, which includes data on the value added, gross output, and import and export shares occupied by SMEs across aggregate sectors. The second is data on the sectoral inter-linkages within countries which can be readily obtained from the OECD-WTO TiVA inter-country-input-output (ICIO) table.

Merging the firm-level data with the TiVA ICIO enables the creation of an augmented ICIO table which can be used to estimate GVC indicators identifying the origin of value added in exports by firm type. The method, laid out in Piacentini and Fortanier (2015) and Fortanier and Miao (2016) involves (i) splitting the columns and rows of the TiVA ICIO table, (ii) separating out SMEs and large firms using weights obtained from detailed firm-level data, and (iii) capturing the share of value added, gross output, gross exports and imports.

Once the split of the ICIO is made, the computation of indicators capturing the contribution of SMEs to exports involves using familiar techniques for the calculation of GVC participation indicators decomposing gross exports into domestic and foreign value added components (see OECD, 2013 for a discussion of the method). It is thus possible to identify the origin of this value added in terms of firm type, enabling the calculation of direct and indirect contributions of SMEs to the production of gross exports.

The depth and coverage of the firm-level data, in terms of variables, representativeness and time span determines the precision of the estimated contribution of SMEs to exports. Currently, firm-level data exists for most ASEAN countries, however, to date, access to these data has only been secured for Singapore, Thailand, Indonesia and Viet Nam (see Annex).

A further challenge is that these surveys often do not capture a representative sample of micro-enterprises which make the bulk of firms in ASEAN countries (according to Deloitte (2014) 99% of SMEs in Indonesia are micro-enterprises). Additionally, firms which are unregistered or informal – and likely to employ a large share of workers – tend not to be covered.

Source: Lopez-Gonzalez (2017).

2.2. How are SMEs participating on aggregate?

There are key differences between small and large firm participation in GVCs. Through *imports*, for instance, participation is lower for SMEs than it is for larger firms (Figure 3). In Thailand, 36% of the value added in SME exports is foreign, as compared to 53% for larger firms in the same manufacturing sectors. Changes in participation over time have been relatively consistent across SMEs and large firms (within countries although not between countries).⁸

Statistics from firm-level data corroborate the lower engagement of SMEs as importers showing that in selected ASEAN countries (Indonesia, Viet Nam and Thailand) only 6-19% of SMEs import, as compared to 44-71% of large firms. It is thus worth asking whether these differences reflect firm structure (e.g., larger firms may have better links to foreign supply chains, in particular if they are subsidiaries of MNCs), or whether there are other reasons for SMEs importing less (Lopez-Gonzalez, 2017).

⁸ This suggests that changes might be driven by structural characteristics such as changes in the composition of GDP etc. rather than changes specific to firm size.

Figure 3. Origin of value added in gross exports of manufacturing SMEs in ASEAN

Note: All figures are aggregates for manufacturing sectors that are common across the countries covered. SMEs are defined as firms with less than 200 employees. Bars present data from 2012 in Thailand, 2013 in Indonesia, 2011 in Singapore and 2011 in Viet Nam. Initial year data is from 2007 for Thailand, 2006 in Indonesia, 2005 in Singapore and 2010 for Viet Nam.

Source: Authors' calculations.

By contrast, Southeast Asian SMEs are, in relative terms, more engaged as *direct exporters* of intermediates into GVCs than larger firms.⁹ For example, in Thailand, 18% of direct SME exports are sold to firms abroad for further export processing; for large firms, it is only 8% (Figure 4). This is likely to reflect that SMEs are better suited to producing intermediate rather than final goods. With this form of participation growing in the region, new opportunities for developing the economic activity of SMEs are likely to arise.¹⁰

However, here too the firm evidence suggests that the share of firms that export, whether intermediates or final products, is lower for SMEs (13% in Indonesia, 8% in Viet Nam and 5% in Thailand) than it is for large firms (50%, 69% and 55%, respectively). This means that, although SMEs might be more specialised in producing intermediates, they struggle to integrate in GVCs through exports.

⁹ Direct exports of intermediates should not be confused with direct exports shown in Figure 5, which include both intermediates and finished goods.

¹⁰ This may be particularly relevant in service sectors: for instance, in Viet Nam, the share of SME exports used by other countries to produce exports jumps from 11% - when considering manufacturing SMEs only - to 17% when service firms are included.

Figure 4. Changes in forward participation - SMEs and large firms

Note: All figures are aggregates for manufacturing sectors that are common across the countries covered. SMEs are defined as firms with less than 200 employees. Bars present data from 2012 in Thailand, 2013 in Indonesia, 2011 in Singapore and 2011 in Viet Nam. Previous year data is from 2007 for Thailand, 2006 in Indonesia, 2005 in Singapore and 2010 for Viet Nam.

Source: Authors' calculations.

Indirect exporting, or selling intermediate goods domestically to other firms that then export, is another important channel for SME internationalisation in the region (Figure 5). For example, in Viet Nam, SMEs represent 12% of total gross exports, but, when considering indirect exports through larger firms, the share of SMEs in gross exports more than doubles to 27%. In Indonesia and Singapore SMEs export 25% and 28% more when indirect exporting is taken into consideration while in Thailand SMEs export 60% more indirectly than they do directly. The evidence also suggests that indirect exports are growing in all countries except Singapore, again highlighting emerging opportunities for further indirect participation.

Figure 5. Direct and indirect exports of Manufacturing SMEs

Note: All figures are aggregates for manufacturing sectors that are common across the countries covered. SMEs are defined as firms with less than 200 employees.

Source: Authors' calculations.

2.3. How are they participating across different sectors?

Aggregate engagement in GVCs, whether predominantly forward or backward, is strongly determined by the dominant sector of activity within the economy. That is, countries which tend to specialise in services or in natural resources often have strong forward participation rates because these sectors tend to be more upstream. By contrast, those that specialise in manufacturing activities tend to exhibit stronger backward participation rates, reflecting the strong sourcing element of manufacturing activities (Figure 6).

To identify whether SMEs in the region are relatively more specialised in backward or forward participation an index of specialisation can be derived by dividing current participation by global average participation in the same sectors (Figure 7). Values above zero show high degrees of specialisation while those below show the opposite. For *forward participation*, this exercise reveals that:

- Indonesian SMEs show high forward participation in traditional GVC sectors, such as motor vehicles and machinery equipment, despite these traditionally being strong backward participation sectors. This suggests that Indonesian SMEs tend to be more upstream than average in these sectors. At the same time, Indonesian SMEs also show high forward integration in coke and textiles.
- In Singapore, SMEs show a higher forward participation in machinery and equipment and motor vehicles suggesting a more upstream position of SMEs than global averages.

- Thai SMEs' forward participation rates are highest for coke, other transport equipment and textiles. Similar to Indonesian SMEs, Thai SMEs also exhibit relatively high rates for certain traditional GVC sectors (namely, machinery and equipment and computer, electronic and optics).
- In Viet Nam, forward participation rates tend to be lower relative to the world, suggesting they are less competitive in upstream activities. Noteworthy exceptions are in services sectors such as hotel and restaurants; construction; computer services; and agricultural goods.

Figure 6. Global backward and forward participation rates by sector (2013)

Note: The markers over the columns identify values in 2000.

Source: Lopez-Gonzalez (2016).

Backward participation rates also vary across countries and sectors:

- Viet Nam has high backward participation rates relative to the rest of the world in mining and quarrying and traditional GVC sectors (machinery and equipment and computer, electronic and optics). This suggests that Vietnamese SMEs may be engaging in assembly activities in these sectors.
- Thai SMEs also show strong participation in traditional GVC sectors such as motor vehicles and other manufacturing, but they also show high participation in fabricated metals.
- The relative backward participation rates of Indonesian SMEs are the lowest; only a couple sectors have positive rates – including pulp and paper, machinery and equipment, and motor vehicles.
- In Singapore SMEs operating in the food products sector have a higher backward participation than global averages suggesting that the sector is strongly reliant on foreign inputs.

Figure 7. SMEs' backward and forward participation rates relative to the world, by sector and country

Note: SMEs are defined as firms with less than 200 employees.

Source: Authors' calculations.

Where *indirect exports* are concerned (Figure 8), the mapping exercise reveals that, while SMEs have low direct exports in GVC intensive sectors such as Computer and electronic equipment or motor-vehicles, their indirect exports are, in relative terms, large. For instance, in the electrical and optical equipment sector Thai SMEs export twice as much indirectly than they do directly. And while SMEs also rely on indirect exporting in lower technology intensive sectors such as textiles or food products, they often represent a higher share of direct exports (see Annex A for figures showing relative direct versus indirect exporting).

Figure 8. SMEs' indirect exports by sector and country

Note: SMEs are defined as firms with less than 200 employees. Direct exporting is defined as the share of SME value added exports in a particular sector over the total share of value added exports by firm type. Indirect or total captures what SMEs sell to other firms in the same sector for these to export.

Source: Authors' calculations.

2.4. What role for services?

Capturing participation in services sectors is more difficult – firm-level data across services sectors is harder to come by. Still, the importance of services can be identified in the context of manufacturing SMEs. Services have an important role to play in SME engagement in GVCs – both through imports and exports (direct and indirect). On the import side, SMEs might gain access to cheaper or more sophisticated services such as marketing and accounting from companies abroad (Kowalski et al., 2015). In turn, this allows SMEs to specialise and boost their competitiveness domestically and abroad. Indeed, Lopez-Gonzalez (2016) shows that sourcing services value added from abroad has a strong positive impact on domestic value added in exports.

SMEs can also participate in GVCs by exporting services directly. For instance, in Viet Nam, the only country for which firm-level data in services sectors was available, the share of SME exports used by other countries to produce exports jumps from 11%, when considering manufacturing SMEs only, to 17% when service firms are included (Figure 9). However, the World Bank (2017) notes that, relative to other countries, service exports in Viet Nam are underdeveloped and declining as a share of gross exports. This could be because Vietnamese services tend to be in low value-added sectors such as wholesale and retail trade and that manufacturing firms rely on imported services. However, it could also be in part driven by Viet Nam's specialisation in export sectors that are less service intensive (World Bank, 2017).

Figure 9. Forward participation of Vietnamese SMEs including and excluding service inputs

Source: Authors' calculations based on Vietnamese firm-level data and TiVA.

2.5. Conclusions

This mapping exercise offers a set of conditioning facts providing context to the remainder of the analysis carried out in this report. It reveals that SMEs in the region participate less than larger firms whether through imports or exports. SMEs use less imports in trade and production than larger firms which means that they have a reduced ability to leverage imports to increase their competitiveness. The analysis also shows that SMEs in the region are more specialised than larger firms in directly exporting intermediates traded in global value chains. This means that they have a pre-disposition to specialise in the production of intermediates which should allow them to slot into global production, however, firm-level evidence also shows that they direct insertion in GVCs remains relatively low. Finally, the analysis also shows that SMEs in the region internationalise through indirect means, that is by selling intermediate goods to local firms for further export. This is most obvious in sectors which are traditionally considered as GVC intensive.

It is worth noting that this SME participation is taking place in an evolving environment. There are signs that the expansion of GVCs is slowing down due to changes in demand, automation and the transformation of business models arising from the digital transformation. This means that international competition is intensifying, underscoring that increasing participation or benefitting from the evolving environment might become increasingly challenging, highlighting the importance of removing unnecessary costs and targeting policy interventions aimed at supporting participation appropriately.

3. What benefits are SMEs drawing from their participation in GVCs?

GVC participation is not an end in itself but a means to achieving greater economic development through, for example, productivity growth, employment generation or greater inclusiveness. The aim of this section is to identify how SME participation is linked with such outcomes and to discuss some of the resulting challenges in realising benefits. The analysis shows that SME participation in GVCs is associated with higher domestic value creation, productivity and upgrading in value chains, also helping deliver more jobs and higher wages. However, it also shows that employment benefits are not always equally distributed across genders. For instance, in Indonesia, while SMEs that participate in GVCs create the most jobs for women, they create even more for men. Overall, the analysis points to there being extensive benefits for SMEs from participation, suggesting that there is a strong case to promote further engagement. However, it also suggests that efforts to make participation more equally distributed across genders are needed.

3.1. Introduction

Although participation in GVCs has been shown to offer new opportunities for firms in developed and developing countries, whether and how SMEs in the region are benefitting remains unclear. Participation in GVCs is also not an end in itself. Rather, it is a means through which SMEs may increase their productivity, generate more employment or otherwise contribute towards more inclusive economic outcomes.

The aim of this section is to investigate how SMEs in the region might gain from further integration into GVCs by identifying how participation is linked to different outcomes and to discuss some of the challenges that SMEs might face moving forward. The section draws on the related literature and presents an analysis of firm-level and TiVA data for the ASEAN region to help address the current empirical gap in this field. While the aim is to strengthen the evidence base, findings should be interpreted with care as this topic is difficult to tackle methodologically. Correlations between different measures of participation and benefits do not necessarily imply causation; however, they point to a more select set of relationships that may matter and highlight the path for future work.

The rest of this section is organised as follows. The next section explores the effects of SME participation in GVCs on firm growth, productivity and upgrading. This is followed by a discussion of some of the implications of participation for wages and employment. The subsequent section considers a range of other effects, such as social and environmental impacts. The final section concludes.

3.2. How does GVC participation affect SME growth, productivity and upgrading?

Participation in GVCs, whether through imports or exports, can affect firm performance in a number of ways. Importing, for instance, has been associated with growing productivity and upgrading (Kowalski et al., 2015). Exporting, in turn, is linked with more productive firms paying higher wages and generating more jobs (Wagner, 2012). However, the extent to which these benefits are currently being realised by SMEs in ASEAN remains an open question.

At the same time, GVC participation may also expose firms to a number of risks or challenges that threaten firm performance – including exposure to shocks, increased competition, political

uncertainty and economic crises. Against this backdrop, this section explores the potential benefits and challenges of GVCs for SMEs in the region in more depth.

3.2.1. *What are the benefits of importing?*

Benefits from importing arise through different channels (see Box 4 for a review of the related literature). For example, access to cheaper or more sophisticated inputs from abroad may provide firms, including SMEs, with a competitive advantage, boosting productivity and allowing these to generate more value added (Vogel and Wagner, 2010 and Bas and Strauss-Kahn, 2014 and 2015; Wagner, 2012; WTO, 2016, Lopez-Gonzalez, 2017). However, reliance on foreign inputs also raises challenges by exposing SMEs to greater volatility. Shocks abroad may disrupt supplies or currency fluctuations may affect affordability (OECD, 2012b); importing may thus be limited to SMEs that can withstand such shocks.

Box 4. Importing as a means of benefitting from GVCs

The empirical literature on importing and firm performance highlights the link between importing inputs and productivity growth. Kasahara and Rodriguez (2008), for instance, find that productivity increases when firms switch from being a non-importer to an importer. Jagemeier (2016) also shows that the level of integration matters: productivity growth is higher among firms that rely more on imported inputs. Moreover, several studies suggest that productivity levels are even higher among firms that both import and export (e.g. Castellani et al., 2010).

Recent OECD evidence also suggests that importing inputs is associated with higher labour productivity in SMEs. Drawing on cross-sectional data, this relationship holds across different income categories (Lopez-Gonzalez, 2017). However, Criscuolo and Timmis (2017) nuance prior findings, suggesting that not all firms will benefit equally. Rather, higher productivity growth rates are achieved by smaller firms that are customers in central hubs of global production networks – as opposed to peripheral sectors. They also find that productivity growth is higher among smaller firms that have faster-growing foreign buyers or suppliers.

Importing inputs may – often through productivity improvements – also help SMEs to upgrade. For instance, Bas and Strauss-Kahn (2014) found that better sourcing or use of foreign technologies contributed to product upgrading of exports in China. Kowalski et al. (2015) also find a positive relationship between backward participation (the use of imported inputs in the production of exports) and the sophistication of export bundles, indicative of product upgrading. Increases in backward participation are also associated with export diversification, which can be interpreted as a proxy for functional upgrading (Kowalski et al., 2015).

Whether such linkages between importing inputs and product, process and functional upgrading hold true for SMEs in developing countries remains an open question. The Centre for the Promotion of Imports (CPI) finds anecdotal evidence from SME exporters in developing countries that participation in GVCs through imported inputs leads to process upgrading (namely through more professional supply chain management and business operations) as well product upgrading (through expansion into new products and services) (WTO, 2016). However, empirical work on this issue is still limited.

Evidence for ASEAN SMEs, obtained by combining firm-level data with the TiVA database, suggests that there is a positive relationship between SMEs' use of foreign value added and output growth, both through trade and domestic sales (Figure 10). ASEAN SMEs that increased their use of foreign value added most (i.e. their backward participation) experienced larger increases in their trade and non-trade output (domestic value added in export and output net of exports, respectively). This also suggests that SMEs do not necessarily have to export to benefit from GVCs, provided they are able to access cheaper imported intermediates or leverage new technologies embodied in these imports (Lopez-Gonzalez, 2017).

Figure 10. Change in use of foreign value added in SMEs is linked with stronger trade and domestic performance

Note: Figures show log changes in the use of foreign value added to produce exports and log changes in i) domestic value added in exports; and ii) non-trade output calculated as gross output minus exports. Data is limited to SMEs and presented at the sector level.

Source: Authors' calculations using TiVA and firm-level data.

At the same time, firm-level evidence also points towards links between importing and productivity growth. In Indonesia, the SMEs that increased their share of imported inputs most also experienced higher total factor productivity growth (Figure 11), a similar pattern also emerges for SMEs in Thailand.¹¹

The relationship between importing and product upgrading (sales of new products) or process upgrading (introduction of new processes) is harder to discern. However, data from the World Bank Enterprise Survey provides some insights showing that a higher share of SMEs that import is associated with a higher share of SMEs that have introduced new products or new processes in the last three years across seven ASEAN countries (Figure 12). While not a causal relationship, this highlights plausible associations between importing and product upgrading in the region similar to those identified for other countries in Bas and Strauss-Kahn (2014) or Kowalski et al. (2015).

¹¹ Data available upon request.

Figure 11. SME imports and total factor productivity in Indonesia

Note: Total factor productivity is calculated by using the Olley-Pakes method.

Source: Authors' calculations using Indonesia BPS manufacturing survey.

Figure 12. Importing inputs, product upgrading and process upgrading among SMEs in selected ASEAN countries

Source: Authors' calculations using WBES data from Cambodia, Indonesia, Lao PDR, Myanmar, Malaysia, the Philippines and Thailand.

Moreover, evidence from the Thai Enterprise Survey also suggests a positive relationship between imported inputs and upgrading (Figure 13). For instance, 84% of Thai SMEs surveyed reported that imported inputs led to product upgrading, whereas only 62% of SMEs reported that inputs from foreign-owned firms in Thailand led to product upgrading. Imported inputs were also more frequently associated with process upgrading, functional upgrading and intersectoral upgrading than local inputs. However, imported inputs were associated with higher costs suggesting that, although more expensive, they may be of higher quality.

Figure 13. Input sourcing and upgrading among Thai SMEs

Note: This figure presents the share of SMEs that report upgrading as a result of buying inputs from a given type of firm. Data is limited to responses from the 42 SMEs that have purchased inputs from all three categories: imports, local inputs from foreign-invested firms and local inputs from Thai-owned firms.

Source: OECD-UNIDO Thai Enterprise Survey.

In sum, the empirical analysis shows that SMEs in the region benefit from greater access to imports, whether through increases in value added, growing total factor productivity or upgrading. It also suggests that access to imports enables firms to increase their domestic sales suggesting that SMEs do not need to export to benefit from GVCs provided they make the most of importing.

3.2.2. What are the benefits of exporting?

Although exporting firms are more productive, pay higher wages and generate more jobs (Wagner, 2012), the direction of the causal links is hard to establish (see Box 5 for a review of the literature). Does exporting increase productivity or do more productive firms have a higher propensity to export?¹² Similarly, it is hard to discern whether it is the most productive SMEs which self-select into GVCs or if participation in GVCs as exporters leads to productivity growth.

Irrespective of the direction of the links, growing participation as exporters is likely to lead to new opportunities to expand sales into overseas markets, helping SMEs improve economies of scale. Information and knowledge spillovers from buyers in a GVC may also increase SME productivity (WTO, 2016). Indeed, a number of empirical studies have associated GVC participation or exporting with productivity growth. For instance, Jagemeier (2010) finds that GVC participation helps to close the productivity gap between domestic firms and foreign firms. Moreover, in support of the Melitz (2003) model, Powell and Wagner (2014) show that exporters are more productive than non-exporters, suggesting that trade opening leads to the reallocation of resources from less productive firms to more productive firms. Lastly, recent research on

¹² Research from OECD countries on the benefits of exporting, for instance, is divided on whether firms benefit from exporting or higher performers self-select into export markets (OECD, 2012a). See also Golovko and Valentini, 2011; Bustos, 2011; Salomon and Shaver, 2005; Crespi et al., 2008; Lileeva and Trefler, 2010; Bratti and Felice, 2012; Bas, 2012; Altomonte et al., 2013).

ASEAN countries shows that value added per worker is higher in the production of intermediates for export relative to the production of gross exports (Lopez-Gonzalez, 2016) suggesting that there might be additional benefits to exporting in GVCs relative to just exporting final goods.

**Box 5. Growth, productivity and upgrading effects of GVC participation through exports
– a review of the related literature**

A number of factors may explain why evidence on the growth, productivity and upgrading effects of GVC participation is relatively limited. First, the benefits may vary across firms. Spillovers may be greater for younger firms, for instance (WTO, 2016). Moreover, an SME's capacity may also impact the benefits of GVC participation for productivity growth: firms with more skilled employees may be better able to absorb knowledge and technology in a GVC context and thus may achieve higher profitability from GVC participation (OECD, 2017b; Morrison, Pietrobelli and Rabellotti, 2008). More advanced SMEs may also have more opportunities for information spillovers (UNIDO, 2015), and may have an easier time meeting international standards. Calza, Goedhuys and Trifkovic (2018) find that SMEs in Viet Nam experience a productivity premium when they possess an internationally recognised standard certificate.

The type of relationship that SMEs establish with lead firms in GVCs – ranging from arm's length market relationships with limited integration to hierarchical governance in vertically integrated arrangements – may also affect positive spillovers. In captive relationships, potential benefits for SMEs might be more limited: lead firms set the terms of the contract and typically have requirements that are specific to that particular buyer, increasing the costs for SMEs of selling to others (UNIDO, 2015). For instance, in the case of Indonesia, captive and hierarchical governance relationships with lead firms are found to constrain opportunities for productivity growth and upgrading in the garment and electronics sectors. Kadarusman and Nadvi (2013) find that a quasi-hierarchical relationship may enable process or product upgrading, but may impede functional upgrading. In contrast, they find evidence of functional upgrading among Indonesian firms that do not engage in GVCs. This is in line with the findings of a UNIDO study (2015), which argues that only a minority of firms participating in GVCs in developing countries draw on lead firms for privileged information or technology. Rather, they suggest that innovation typically comes from other sources – in-house R&D or knowledge sharing with firms outside the GVC.¹³

Evidence from the Thai Enterprise Survey suggests that the length of relationship between SMEs and overseas buyers may also matter. In particular, the share of firms that report that exporting has led to upgrading (process, functional or intersectoral) is higher among SMEs that export to long-term buyers than SMEs that export to non long-term buyers (Annex D). This suggests that benefits might accrue over time, as overseas buyers may be more likely to invest in their SME suppliers after repeated interactions. Relationship length appears to matter less for exporting SMEs that have upgraded to meet standards, plausibly because these standards allow them to sell to more buyers.

The benefits of GVC participation may also vary across sectors. Giuliani, Pietrobelli and Rabellotti (2005) find that lead firms in quasi-hierarchical value chains tend to promote product or process upgrading in Latin American suppliers in the traditional manufacturing and natural resource-based firms, but not in more complex industries such as automobiles, aircraft industries, ICT and consumer electronics. In line with earlier evidence, quasi-hierarchical relationships do not encourage functional upgrading in any sectors.

Lastly, clustering may affect the benefits of GVC participation. Operating near a geographic cluster can reduce many of the typical constraints on SME competitiveness, such as difficulty accessing information, technology and markets (Giuliani et al., 2005). Indeed, being part of a network of firms selling the same product to the same destination has been shown to increase the rate of survival in the export market, as well as the likelihood of upgrading (World Bank, 2013b). Humphrey and Schmitz (2002) also note that network relationships between firms with complementary relationships may be most conducive to upgrading, though these are less common in developing countries.

¹³ The type of relationship SMEs have with their buyers also has implications for the level of risk exposure. During economic downturns, SMEs that are more integrated with lead firms – for instance, as majority-owned subsidiaries – may face less volatility. When dealing with arm's length buyers, a decline in demand may push SMEs out of the market (Cattaneo et al., 2010).

However, it is also worth highlighting that GVC export opportunities can be more volatile than traditional export opportunities. In a GVC, deeper international inter-linkages imply that SMEs are more exposed to shocks in other countries along the chain, including natural disasters, geopolitical disruptions, policy changes such as behind-the-border regulatory measures, economic crises, currency and price fluctuations, intellectual property theft, changes in regulation and increased competition from abroad (ADBI, 2014; OECD, 2012b). The added challenge for SMEs in a GVC setting is that risks associated with changing prices and demand are often pushed down the value chain to suppliers (World Bank, 2013a; OECD-WTO-UNCTAD, 2013). Volatility is exacerbated in a GVC setting as downstream firms tend to use up current inventories when faced with a decline in demand, triggering ripple effects along the value chain to upstream suppliers (OECD, 2013). Such trends may put particular pressure on less productive SMEs, crowding them out of the market.

Against this background, evidence on the impact of internationalisation through exports on firm performance in Southeast Asia, identified using TiVA and firm-level data, suggest that there is a positive relationship between GVC participation through exports and industry performance. As shown in Figure 14, industries that exhibit growing forward participation also tend to have higher growth in their output.¹⁴

Figure 14. Change in forward participation in SMEs linked with greater domestic performance

Note: The figure shows log changes in forward participation and non-trade output calculated as gross output minus exports.

Source: Authors' calculations using TiVA and firm-level data.

Evidence from the Thai Enterprise Survey, while not representative, also provides some support for a positive relationship between GVC participation through direct exports and upgrading. For Thai SMEs, the highest share of upgrading is reported as a result of exporting, with 44% of SMEs reporting that exporting has enabled their firm to upgrade processes (Figure 15). By contrast, of the same sample of firms, only 24% suggest that sales to foreign-invested firms in Thailand led to processing upgrading (and only 35% for sales to Thai-owned firms in Thailand).

GVC participation through indirect exports may also offer benefits for SMEs. While difficult to disentangle empirically, the Thai Enterprise Survey provides some evidence to this effect. In

¹⁴ Domestic value added in exports is composed of value added that is consumed in the destination country and value added that is used by foreign firms to produce exports (forward participation). To avoid mechanical associations the forward participation element of domestic value added in export is netted out.

particular, SMEs that export indirectly (by selling inputs to other firms for further processing and eventual export) report upgrading more frequently (in particular, process and intersectoral upgrading) than SMEs that sell locally to firms that do not export (Figure 16). For instance, 46% of SMEs that export indirectly associate domestic sales with process upgrading; in contrast, only 31% of SMEs that are not indirect exporters report that domestic sales led to process upgrading.

Figure 15. Direct exporting and upgrading for Thai SMEs

Note: This figure presents the share of SMEs that report upgrading as a result of selling to a given type of firm. Data is limited to responses from the 84 SMEs that sold outputs to all three categories of firms.

Source: OECD-UNIDO Thai Enterprise Survey.

Figure 16. Benefits of indirect exporting for Thai SMEs

Note: This figure presents the share of SMEs that report upgrading as a result of domestic sales that are eventually exported (indirect exporters) or sold domestically (not indirect exporters). Data is limited to responses from the 56 SMEs that are indirect exporters and the 47 SMEs that sell domestically but are not indirect exporters.

Source: OECD-UNIDO Thai Enterprise Survey.

3.3. How does GVC participation affect SME wages and employment?

GVC participation will also have implications for jobs in SME and the wages they pay. For instance, rising sales and productivity growth for GVC participants – as suggested in the previous section – may enable SMEs to pay higher wages or create more jobs. Who takes up these jobs, in terms of the gender or skill distribution, will also be an important factor in making GVCs work for inclusiveness.

3.3.1. What are the benefits of importing?

Theoretically, GVC participation through imports should enable SMEs to become more competitive, allowing them to expand sales and hire more workers or pay higher wages. That said, it is also possible that higher productivity and upgrading lead SMEs to automatize, outsource certain tasks or hire more skilled workers. More broadly, imports may also compete with domestic sales, giving rise to a substitution effect which can have a negative impact on SME sales. There is, however, little information on whether imports compete with sales and ample information on the extent to which firms use imports. This makes it difficult to draw conclusions on the net impact of importing on SME employment, restricting the analysis to comparisons between SMEs that import against those that do not.

With this caveat in mind, a closer look at the Indonesian and Thai cases suggests that, on average, importing has helped SMEs to create jobs in manufacturing sectors relative to SMEs that do not import. Indonesian SMEs that import have experienced the highest growth in jobs in recent years: the share of jobs in importing SMEs increased from 8% in 2003 to 13% in 2013 (Figure 17). Over the same period, the share of jobs in non-importing SMEs increased only from 16% to 17% and the share of jobs in large firms declined (for both importers and non-importers). SMEs in the Thai Enterprise Survey also suggest a positive relationship between importing and employment: 12% of Thai SMEs noted that importing inputs enabled their firms to hire more workers; only 6% suggested that buying local inputs had the same benefit.

Figure 17. Share of total employment in Indonesian firms by firm size and importer status, 2003-2013

Note: SMEs are defined as firms with less than 200 employees. A firm is identified as an importer if it declares to have positive imports in at least one year over the available time-window 2000-13.

Source: Authors' calculation based on firm-level data.

3.3.2. What are the benefits of exporting?

Firm output and productivity growth, arising from growing GVC participation through exports, may also promote job creation in developed countries (Shepherd and Stone, 2013) and in developing countries (e.g. OECD-WTO-UNCTAD, 2013; Farole, 2016). Evidence from Lopez-Gonzalez (2016) also suggests that this is the case for the ASEAN region where forward GVC jobs, which are those associated with participating in GVCs through direct exports, grew, on average, 3 times faster than total employment (Table 1). This means that, in 2011, there were 19 million such jobs, making the ASEAN region the biggest global supplier of forward GVC jobs after the People's Republic of China (hereafter "China"). But while this underscores the new opportunities that GVC participation through exports can offer firms in the region, whether or not these employment opportunities are being taken up within SMEs remains unclear.

A closer look at Indonesian firm level data helps provide some further context. Between 2003 and 2013, job growth in exporting SMEs was on par with job growth in the overall economy and thus the share of workers in exporting SMEs remained low but stable at around 9% (Figure 18). Employment in non-exporting SMEs, in contrast, increased from 15% to 20% of total employment. Meanwhile, the largest employment category – large exporters – contracted during this period, (from 57% to 51%) and large non-exporters remained stable at 19%.

These trends suggest that job growth, at least in Indonesia, has been largely due to SMEs; however, non-exporting SMEs appear to be the driving force. This is in line with the results from Table 1 where changes in the employment in exports were smaller than overall changes in employment. It suggests that, while forward GVC jobs are likely to have grown, they currently represent a small share of overall jobs in Indonesia.

Table 1. GVC jobs versus overall employment levels

Country	2011			Changes		
	Total employment	Employment in exports (number and share of total)	Forward GVC jobs - number and share of total	Changes in total employment	Changes in employment in exports	Changes in forward GVC jobs
Brunei	188 000	37 442	9 047	47%	72%	156%
Darussalam		(19.9%)	(4.9%)			
Singapore	2 826 000	1 509 607	378 667	66%	60%	156%
		(53.4%)	(13.4%)			
Cambodia	8 235 000	2 615 104	463 168	81%	105%	46%
		(31.8%)	(5.6%)			
Malaysia	12 012 000	5 528 904	1 287 411	51%	60%	91%
		(46%)	(10.7%)			
The Philippines	37 534 000	8 361 848	2 238 441	47%	47%	150%
		(22.3%)	(6%)			
Thailand	38 842 000	16 502 280	3 677 286	24%	75%	148%
		(42.5%)	(9.5%)			
Viet Nam	52 108 000	23 246 610	5 348 009	39%	203%	336%
		(44.6%)	(10.3%)			
Indonesia	108 725 000	19 089 300	5 519 080	31%	18%	97%
		(17.6%)	(5.1%)			

Note: Aggregate calculations made using the TiVA database and ILO data.

Source: Adapted from Lopez-Gonzalez (2016).

Figure 18. Share of total employment in Indonesian firms by firm size and exporter status, 2003-2013

Note: SMEs are defined as firms with less than 200 employees. A firm is identified as an exporter if it declares to have positive exports in at least one year over the available time-window 2000-13.

Source: Authors' calculation based on firm-level data.

Where wages are concerned, the literature suggests that average wages tend to be higher among SMEs that export than SMEs that do not export in OECD countries (OECD, 2017a).¹⁵ This wage gap is also evident in Indonesia (Figure 19).¹⁶ As expected, large firms that export pay the highest average wages. Still, average wages in exporting SMEs have grown fastest, even surpassing average wages in large non-exporting firms.¹⁷

¹⁵ Shepherd and Stone (2013) also find that – at least in developed countries – wages are higher in firms with international linkages.

¹⁶ A similar trend holds also in Viet Nam and Thailand.

¹⁷ One explanation for the higher wage premium across exporting SMEs and large firms is the greater demand for skilled workers in GVCs. Upgrading in a GVC context may be associated with changes in the workforce composition, as new tasks demand a shift from lower-skilled, labour-intensive jobs to higher-skilled, technology-intensive jobs (Farole, 2016; Gereffi and Fernandez-Stark, 2016). Shepherd and Stone (2013) also show that firms with international linkages in developed countries employed more skilled workers.

Figure 19. Average wage trends by firm size and exporter status in Indonesia

Note: The figure shows average wages per worker across large firms and SMEs and exporter status in local currency. Data is smoothed using a lowess function.

Source: Authors' calculations using Indonesia BPS manufacturing survey.

3.3.3. What are the implications for women?

The impact of GVC participation on gender is much more difficult to establish. In developed countries, Shepherd and Stone (2013) suggest that international linkages increase the share of female workers in the formal sector – potentially because female labour tends to be more flexible and less costly. However, these trends vary across sectors – growth of GVC participation in sectors dominated by female workers, such as apparel, food packing and services, is associated with increases in overall female employment levels (ICTSD, 2017a). But these jobs may offer lower wages.

Gender inequality may also increase as a result of upgrading from GVC participation (Farole, 2016). Evidence from Asian countries suggests that the female to male labour ratio declines as a country's export basket becomes more sophisticated (ICTSD, 2017a). This is attributed to the higher capital or skill intensity associated with growth in manufacturing (World Bank, 2013a; OECD, 2004). However, Shepherd and Stone (2017) suggest there can be a trade-off between female employment levels and female wage levels in such cases.

A closer look at firm-level data from the manufacturing sector from Indonesia suggests that GVC participation through imports does benefit women, but may benefit men more in employment terms. In addition to creating the most jobs in manufacturing overall from 2003 to 2013, SMEs that import also created the most jobs for female workers (Figure 20a). However, exploring changes within categories suggests that more jobs were created for men by importing SMEs (Figure 20b). In terms of net changes in jobs by category of firm during the same decade, the female employment share grew in importing and non-importing SMEs and fell in importing and non-importing large firms.

Figure 20. Share of female employment in Indonesian firms by firm size and importer status – 2003 and 2013

a. Out of total employment

b. Within firm categories

Note: SMEs are defined as firms with less than 200 employees. A firm is identified as an importer if it declares to have positive imports in at least one year over the entire available time-window 2000-13.

Source: Authors' calculation based on firm-level data.

Where exporting firms are concerned, trends in Indonesia also suggest that there might be fewer benefits for women relative to men in terms of employment. From 2003 to 2013, as the largest growth category for employment overall, non-exporting SMEs created the most jobs for women (Figure 21a). Non-exporting firms also experienced the highest net growth in female jobs within firm categories (Figure 21b).

Figure 21. Share of female employment in Indonesian firms by firm size and exporter status – 2003 and 2013

a. Out of total employment

b. Within firm categories

Note: SMEs are defined as firms with less than 200 employees. A firm is identified as an exporter if it declares to have positive exports in at least one year over the available time-window 2000-13. Shares of female workers are computed out of total employment (left panel) and within firm categories (right panel).

Source: Authors' calculation based on firm-level data.

While difficult to capture empirically, it is worth noting that opportunities for upgrading in a GVC context may also be more limited for female-owned SMEs. For instance, constraints on female access to credit mean that female-owned businesses face more limited opportunities for

upgrading. Nearly three-quarters of female-owned SMEs face difficulties accessing finance in developing countries (World Bank, 2013). This can help to explain the smaller size and lower export propensity among female-managed firms (ICTSD, 2017b). OECD research also suggests that female-owned SMEs struggle to access markets due to constraints in information access, networks and government support (OECD, 2017c).

3.4. Does SME participation in GVCs have social or environmental effects?

By integrating SMEs into international networks, GVCs may also have other effects on SMEs, such as spreading international practices on *social* standards (OECD-WTO-UNCTAD, 2013 and UNIDO, 2015). According to Farole (2016), global lead firms increasingly set occupational health and safety standards above the minimum standards required by domestic regulation and the International Labour Organization (ILO); however, whether these firms also demand such standards from their suppliers – many of which are SMEs – is less clear. Moreover, in view of the higher costs associated with meeting these standards, many SMEs will struggle to take advantage of such opportunities.

SME participation in GVCs may also have implications for the *environment*; for instance, lead firms in GVCs may encourage SME suppliers to undertake environmental upgrading of their production systems to green their supply chains and meet standards of overseas buyers and governments (De Marchi, Di Maria and Micelli, 2013). Environmental labelling and information schemes (ELIS) have expanded in recent years, covering a broad spectrum of environmental issues from carbon footprints to sustainable sourcing (OECD, 2016a). While qualifying for the diverse range of ELIS is challenging for many SMEs,¹⁸ those that do obtain certifications may have a competitive edge that could stimulate further growth.

Indeed, results from the Thai Enterprise Survey suggest that lead firms encourage sustainable production practices through all three channels of GVC participation – imports, direct exports and indirect exports (Figure 22).¹⁹ Among the Thai SMEs that export, improvements in sustainable production is more common for firms that have long term relationships with their overseas buyers. For SMEs that sell in the domestic market, improvements in sustainable production is reported more frequently by SMEs that sell inputs to other firms for eventual export (indirect exporters) than SMEs that sell only to firms producing for the domestic market.

GVCs may also provide new opportunities for SMEs to participate in the production of environmental goods and services. In 2011, APEC members committed to reduce tariffs on environmental goods and services (APEC, 2016). With trade opening, production of environmental goods and services (EGS), such as wind turbines, solar panels, electric scooters and electric tuk-tuks can increasingly fragment across borders and provide new opportunities for SMEs.

At the same time, GVC participation through exports may also have negative environmental impacts in ASEAN countries, as pollution-intensive tasks are outsourced to developing regions like Southeast Asia. As many Southeast Asian countries have less stringent environmental requirements than OECD countries, GVCs may have negative implications for the environment.

¹⁸ E.g. due to credit constraints and lack of skilled personnel.

¹⁹ Though to a lesser degree, buying and selling to foreign-invested firms in Thailand are associated with more sustainable production than buying and selling to Thai-owned firms in Thailand, suggesting that foreign-owned firms demand compliance with a higher level of environment standards.

However, evidence of the so-called ‘pollution haven effect’ is limited and it is unclear how such effects differ according to firm size (OECD, 2017e).

Figure 22. How buying and selling affects sustainable production practices of Thai SMEs

Note: This figure presents the share of SMEs that report improvements in sustainable production as a result of buying or selling to a given type of firm. Data is limited to responses from SMEs that have purchased inputs from (or sold outputs to) all three categories of firms.

Source: OECD-UNIDO Thai Enterprise Survey.

3.5. Conclusions

The empirical analysis undertaken in this section underscores that there are many potential benefits for SMEs that integrate into GVCs. Imports, for instance, are associated with growth in trade and domestic sales, higher total factor productivity and higher rates of upgrading. In turn, GVC participation through direct exports is associated with productivity growth and upgrading, although the direction of causation is hard to establish.

SME participation in GVCs also drives diverse *employment* effects. In Indonesia, importing SMEs created the most jobs for both men and women, but it created more jobs for men, suggesting that they may benefit slightly more than women from new employment opportunities. Average wages are also found to be higher among SMEs that export than SMEs that do not export; however, evidence on the net job creation of direct exporters is mixed.

Overall, the analysis suggests that participation in GVCs is a means for attaining greater economic development, productivity and upgrading for SMEs. While there is a greater need to ensure that employment benefits are shared more inclusively among firms and genders, overall, promoting further SME participation in GVC will help deliver more inclusive outcomes.

4. How can policy makers increase SME participation in GVCs?

Having shown, in the previous section, that SME participation in GVCs can help deliver more inclusive outcomes, this section looks at the structural and policy determinants of different modes of participation. The aim is to help policy makers identify the policy levers that might help them promote further SME integration into GVCs. The analysis suggests that policy makers might want to prioritise policies seeking to reduce trade costs. Trade costs hit SMEs harder, reducing their ability to gain competitiveness through imports and to export intermediates. Trade facilitation reforms, which help both large and small firms, have stronger positive effects on SMEs. Additionally, reductions in trade costs through the use of digital technologies will also help SMEs connect with overseas partners and promote further GVC integration. Finally, the analysis also suggests that governments should seek to promote further domestic linkages with a view to increasing indirect exporting. This can be done, by creating an enabling domestic environment through, for example, increasing the ability to enforce contracts.

4.1. Introduction

In view of the benefits associated with further SME engagement in GVCs in the region (Section 3), it is worth exploring how SME participation may be further promoted. In many Southeast Asian countries, GVC participation rates tend to be lower among SMEs than large firms, suggesting opportunities for further integration (Section 2). For instance, only 19% of SMEs in Indonesia, 14% in Viet Nam and 6% in Thailand import.²⁰ By contrast, 44%, 71% and 49% of large firms in these respective countries import. This suggests that many SMEs may not be accessing the benefits associated with GVC participation via imports. At the same time, the share of firms that export directly (intermediates or finished products) is also much lower for SMEs (13% in Indonesia, 8% in Viet Nam and 5% in Thailand) than for large firms (50%, 69% and 55%, respectively), also implying that smaller firms might not be fully benefitting from opportunities on the output side.

While a wealth of literature exists on SMEs and GVCs individually, a comprehensive understanding of the determinants of GVC participation for SMEs – and their relative importance – is lacking. This part of the report aims to fill this gap. It first reviews how a spectrum of firm characteristics and government policies might affect how firms engage in GVCs through trade.²¹ The following section then presents an empirical analysis of the determinants of participation through imports and exports (direct and indirect). The final section concludes with guidance on the reforms policy makers might want to prioritise with a view to promoting further SME integration in GVCs.

²⁰ Statistics are based on representative firm-level survey data. As questions vary across firm-level surveys, variation across countries should be interpreted with caution.

²¹ While potential determinants are separated into firm characteristics and policies for the purposes of structuring this analysis, it is acknowledged that the line between them is often blurred and significant overlap exists.

4.2. What are the potential determinants of participation?

A broad range of factors may determine SME engagement in GVCs. This section explores two main types of determinants: (i) those that relate to the firm more directly; and (ii) those that relate to the policy environment. There are, of course, overlaps between these: the policy environment conditions firm behaviour and firm behaviour and characteristics are reflected in policy intervention. Nevertheless, it is useful to unpack determinants along these lines, focusing on issues generally able to be addressed at the level of firms themselves and those which tend to be outside their control, relating to the environment in which they operate.

4.2.1. Firm-level determinants

SMEs face a number of *informational challenges* that may affect engagement in GVCs. In particular, SMEs tend to have limited access to information – or limited capacity to absorb information – about international markets. This can impede GVC participation by limiting effective marketing and product customisation for foreign markets (OECD, n.d.) as well as identification of buyers or partners overseas (WTO, 2016).²²

ICTs (information and communication technologies) may help SMEs to better manage some of the costs associated with GVC integration as buyers and suppliers.²³ Indeed, digitalisation is also often credited with giving rise to a new breed of micro-multinationals that are 'born global' (OECD, 2017a). However, in general, connectivity and technology adoption tends to be lower among SMEs – particularly in developing countries – thus constraining their efficiency and capacity to engage in GVCs through imports or exports (Clarke et al., 2015; OECD-WB, 2015; ITC, 2015).²⁴

Another set of determinants are related to *productivity*. It is well established that only the most productive firms are able to meet the associated high fixed, and often sunk, costs of exporting (Melitz, 2003; Bernard et al., 2007).²⁵ But capacity constraints, due to lower productivity, may also constrain importing and SMEs' capacity to compete with other firms for positions within GVCs. Factors that may constrain SME productivity include:

²² Indeed, survey evidence from nearly one thousand SMEs in 47 countries identifies related challenges, including difficulty identifying foreign business opportunities; limited information with which to locate or analyse markets; and inability to contact potential overseas customers (OECD, 2008).

²³ Other technologies – such as the Internet of Things, big data analytics, artificial intelligence, additive manufacturing, and/or blockchain – offer new opportunities for productivity gains in the coming years (ASEAN, 2017).

²⁴ Related to information access, another potential determinant of participation in GVCs is geographic location (OECD 2012, Kowalski et. al. 2015). Geographic clustering can promote positive information and technology spillovers as well as provide new business opportunities (OECD, 2017d; WTO, 2016). Indeed, some evidence from the ASEAN region supports this idea: clustering in Viet Nam is associated with productivity spillovers – particularly for foreign-owned firms (Howard et al., 2014). However, geographic clustering may also have disadvantages – such as competition for buyers and human resources – that outweigh the benefits of better information access (Kuroiwa, 2016). For SMEs with limited resources, such challenges may be particularly constraining.

²⁵ Costs associated with exporting directly include setting up a distribution network, applying for patents and licenses abroad, ensuring regulatory compliance and establishing brand recognition (WTO, 2016).

- *Skill deficits*: Smaller firms tend to be less well placed to pay higher wages and attract more productive workers – particularly in developing countries. Some SMEs may also lack the managerial or personnel capacity for managing staff (including foreign staff) or for attracting FDI and benefiting from knowledge transfers through foreign partners (OECD, 2009; OECD, 2017a; OECD, 2008).²⁶
- *Capacity to innovate*: Research from OECD countries suggests that innovation is a key determinant of SME participation in global markets. For instance, process innovation improves SME efficiency and thus allows them to meet the fixed costs of exporting. Moreover, product innovation strengthens SME competitiveness in international markets through new and upgraded products (OECD, 2017a).²⁷
- *Technical capacity*: Not only do SMEs have less disposable income to invest in new technologies and research and development (DeStefano et al., 2017), they also appear to be constrained in adopting new and off-the-shelf technologies or enacting organisational change – two factors that further drive productivity and thus enable SMEs to compete for business in GVCs (OECD, 2016b; Bresnahan et al., 2014).
- *Experience and knowledge*: SMEs tend to be “younger” and thus may not have accumulated the knowledge or knowhow of older firms about engaging in production networks or exporting to different markets (Coeurderoy, Cowling, Licht and Murray, 2012).²⁸ On the other hand, younger firms may prosper in a GVC world if they are more flexible and open to new ways of doing business (Wignaraja, 2013).

A chicken and egg problem also emerges. The more limited skills, technical capacity, innovative capacity and experience and knowledge of SMEs may constrain access to international markets, in turn further restricting their access to productivity-enhancing technologies and scale. The question is whether the opportunities for international participation through the fragmentation of production can reduce the costs of internationalisation sufficiently to give access to productivity-increasing opportunities.

4.2.2. Policy determinants

Firm characteristics are only partly responsible for the level of SME participation in GVCs; the extent to which policies provide an enabling environment – or tackle the core disadvantages or externalities with which SMEs struggle – is also key (Gereffi and Fernandez-Stark, 2016).

Trade policy

Lacking the economies of scale of large firms, trade costs tend to represent a higher share of the value of imported or exported products of SMEs. This means that these costs are, in relative terms, disproportionately shouldered by SMEs (OECD-WB, 2015; Kowalski et al., 2015).

²⁶ Education and labour policy thus have important roles to play in providing the enabling environment for GVC participation by addressing human resource barriers (Gereffi and Fernandez-Stark, 2016).

²⁷ Innovation policy thus has an important role to play in enabling SME participation in GVCs (Gereffi and Fernandez-Stark, 2016).

²⁸ While younger firms tend to be SMEs, not all SMEs are younger firms. The dynamics of young firms, or start-ups, and their contribution to job creation and output are receiving increasing attention. For instance, in the U.S., young firms, which tend to be SMEs, have a much higher likelihood of exiting the market; however, conditional on survival, they also grow at a faster rate than older firms (Haltiwanger et al., 2010).

Moreover, in the context of GVCs, where intermediates cross borders multiple times, trade costs cumulate at each border crossing.

Key trade policies that may affect trade costs include tariffs, regional trade agreements, rules of origin, non-tariff measures, trade facilitation, infrastructure and barriers to trade in services.

- *Tariffs* may affect SME internationalisation in a number of ways. Tariffs on inputs will increase the costs of sourcing from foreign partners, reducing participation via imports. Input tariffs have also been found to affect participation in export markets, as higher production costs reduce competitiveness and therefore demand for exports (Lopez-Gonzalez, 2017). Higher tariffs in the final destination country may also discourage SME participation in GVCs through exports, as they increase the costs of the final product.²⁹
- *Free trade agreements (FTAs)* may facilitate the formation of GVCs (Lopez-Gonzalez, 2012), and – in doing so – provide new opportunities for SMEs by opening new markets. Though the direction of causality is not well understood, the formation of FTAs and GVCs is strongly correlated. The depth of the agreement signed and the number and nature of partners involved are also likely to matter.
- Related to RTAs, particularly in the context of preference utilisation, *rules of origin (ROOs)* may be particularly constraining for SMEs (ADB, 2014). RoOs establish the conditions that a product must meet to be eligible for preferential access in member countries. This is to avoid *trade deflection* where products from non-member countries enter the duty-free zone through the country with the lowest external tariff. Although necessary, complex RoO may restrict both the sourcing and selling choices of firms (see Section 5 for an in-depth discussion).
- *Non-tariff measures (NTMs)* – such as import quotas and technical barriers – may also condition SME participation in GVCs through imports or exports. NTMs often impose a fixed cost, which can be more burdensome for smaller firms (WTO, 2016). However, if SMEs are able to comply, they may gain a competitive edge and can more easily integrate into GVCs (see Cadot et al., 2018).

Trade facilitation measures may also be an important factor affecting the trade costs faced by SMEs when participating in GVCs (ADB, 2015; OECD, 2006). Delays in clearance procedures and complicated customs rules may be disproportionately costly for SMEs because they may lack the economies of scale and capacity needed to navigate complex processes at the border (OECD, 2008). Measures that improve the time, cost and reliability of trade are likely to benefit firms of all sizes and may even have particular advantages for SMEs (Lopez-Gonzalez and Sorescu, 2019).

- Lastly, *barriers to trade in services* such as access to logistics or telecommunication services can affect the costs of doing business with international partners and within GVCs. In OECD countries, an average level of services trade restrictiveness represents the equivalent of an additional 14% tariff for cross-border exports by SMEs relative to large firms (Rouzet et al. 2017). Lower barriers to services are likely to help SMEs better integrate into GVCs.

²⁹ Indeed, while not limited to SMEs, Kowalski et al. (2015) finds that high import tariffs on intermediate inputs are correlated with lower GVC participation rates through imports and high import tariffs in the destination countries are correlated with lower GVC participation through exports.

Other policies

A range of other policy areas may also affect SME internationalisation, as GVCs are embedded in a broader economic, social and institutional context (Gereffi and Fernandez-Stark, 2016). Key examples suggested by the literature include access to finance, infrastructure, investment policy, intellectual property rights and contract enforcement and dispute resolution.

- As a key determinant of SME competitiveness, *access to finance* may also have important implications for GVC participation. Smaller firms, particularly those in developing countries, tend to face higher interest rates and higher rejection rates due to asymmetric information about past firm performance and insufficient collateral. This market failure is a key barrier to SME internationalisation, as limited finance impedes their ability to invest in skills, technology and capital, hence constraining their capacity to become more competitive, import, enter export markets or partner with larger firms (WTO, 2016; OECD, 2017a; Lopez-Gonzalez, 2017). In the GVC context, access to trade finance (for import or exports) may also constrain participation (WTO, 2016).³⁰ In developing countries, access is often limited by a weak regulatory environment or limited expertise among local banks to cover more specialised import and export-related finance. Many SMEs are also not aware of the range of trade finance tools available to them (ADB, 2015; OECD, 2017a; WTO, 2016).³¹
- *Physical infrastructure* – such as roads, ports and electricity – are central to GVC participation for all firms. Kowalski et al. (2015) find that the quality of infrastructure is an important determinant of GVC participation through imported inputs. Improving physical infrastructure can also boost direct exports by reducing trade costs. For instance, Volpe Martincus et al. (2017) find that roads promote exports and job growth. The relative importance of physical infrastructure for small and large firms to engage in the various GVC trade channels, however, is not well explored.
- *Investment policy* may also affect SME participation in GVCs. For instance, FDI policies that encourage foreign firms to create linkages with domestic firms may help SMEs to engage in GVCs through direct or indirect exports (OECD, 2012; OECD, n.d; OECD-WB, 2015; OECD-UNIDO, 2018). These linkages may also enable SMEs to import foreign inputs for further processing. Indeed, drawing on an ERIA survey from 2009, Harvie, Narjoko, and Oum (2010) find that foreign ownership is a key determinant of SME engagement in value chains (either through imports or direct exports).
- Finally, weak *contract enforcement and dispute resolution* mechanisms may also affect SME willingness to engage with foreign suppliers or buyers. The necessary expertise in foreign laws and legal costs associated with enforcing overseas contracts may pose a burden on smaller firms without economies of scale.

³⁰ In 2013, 50% of SME applications for trade finance were rejected, in contrast to 7% for multinationals. Once rejected, less than one third of SMEs applied for alternative financing (ADB, 2015).

³¹ While likely a key determinant of SME participation in GVCs, quantifying the importance of access to finance is challenging empirically.

4.3. What determines participation in ASEAN countries?

To identify how governments can most effectively promote further engagement, empirical evidence is needed to unpack which firm characteristics and policies matter for each participation channel. This section explores the relative importance of some of these policies for the different channels of participation. Due to data and methodological limitations not all variables detailed in the previous section are included.

The analysis draws on two databases. The first is the newly created database identifying indicators of GVC participation for SMEs and large firms in a selection of ASEAN countries. As discussed in Box 3, it is constructed by merging information from firm level data for Indonesia, Singapore, Thailand and Viet Nam with the OECD-WTO Inter-Country-Input-Output table (the method is based on Miao and Fortanier, 2016 and 2018 and the construction of the database detailed in Lopez-Gonzalez, 2017) to calculate measures of GVC integration. This *meso-level* dataset is best suited to capturing the policy related determinants of participation. The second is the firm-level data for the aforementioned countries. This *micro-level* dataset is better suited to identifying the firm level characteristics that determine the different modes of engagement.

4.3.1. Imports

Importing allows firms to access cheaper and more sophisticated intermediate goods and new technologies, helping them improve their performance and employment opportunities (see Section 3). Identifying the structural and policy determinants of this mode of participation across both SMEs and large firms can provide guidance to policymakers seeking to increase such benefits (Figure 23).

The results, derived from a gravity model which controls for multilateral resistance and sector heterogeneity in GVC participation (through country-year and sector fixed effects), show that the determinants of participation via imports, measured as the value of goods and services imported by the firm, are broadly similar for both SMEs and large firms. Demand for imports increases with the economic activity of the firm (proxied by firm output³²) and the size of the partner (measured by the partner country GDP) but decreases with distance. This is in-line with traditional observations from the gravity literature (see Head and Mayer, 2014).

However, the evidence shows that trade costs hit importing SMEs harder than larger firms. Indeed, SMEs tend to source more from contiguous countries and appear to be more affected by distance than larger firms. At the same time, SMEs are also more affected by improvements in the efficiency of domestic Customs relative to larger firms.

Where other policies are concerned, FDI inflows do not appear to have a statistically significant effect on SMEs but are associated with reductions in imported inputs for large firms. This result may reflect the different nature of the activities undertaken by firms of different sizes along the value chain.³³

Overall the results show that a range of structural and policy measures can be targeted in view of better integrating SMEs into GVCs on the import side. Key amongst these are reductions in trade costs associated with importing: reducing tariff barriers to trade, increasing customs efficiency at

³² Firm gross output is used rather than GDP (or firm value added) following Baldwin and Taglione (2011).

³³ One possible channel of influence is that larger firms, traditionally the recipients of FDI, may be specialising in upstream activities while smaller firms adapt and specialise in downstream activities that require further importing.

home and reducing costs related to getting products to the border and beyond will help SMEs better exploit the new opportunities offered by GVCs. Since these factors also contribute to large firm integration in GVCs via imports, these reforms will also help larger firms draw benefits.

Figure 23. Determinants of GVC participation through imports

Note: The figure shows significant standardised coefficients from a gravity regression. See Annex E for overall results.

Source: Authors' calculations.

4.3.2. Direct exports of intermediates

SME participation in GVCs through direct exports (forward participation) is also associated with positive outcomes such as higher output growth and paying higher wages. Indeed, as discussed in Section 3, GVCs offer firms, notably SMEs, new opportunities to specialise in segments of production along the value chain rather than having to produce entire products. Identifying what determines this type of engagement can help better target policies seeking to promote further output benefits from GVCs for SMEs.

Using a gravity model similar to that of the previous section but capturing the value added exported to other countries for production of their exports (the forward participation value), Figure 24 shows the relative importance of different determinants of participation across SMEs and large firms.³⁴

³⁴ As was the case in the previous section, reporter-year, partner-year and sector fixed effects are used to control for multilateral resistance and time-invariant sector specificities related to differences in GVC participation across sectors.

Figure 24. Determinants of participation in GVCs through direct exports

Note: The figure shows significant standardised coefficients from a gravity regression. See Annex E for overall results.

Source: Authors' calculations.

The results, in line with expectations, show a positive association of participation via direct exports with respect to supply variables and a negative association with respect to distance across both SMEs and large firms. However differences between firms arise: SMEs appear to have lower supply elasticity than large firms, reflecting that SMEs face additional supply-side constraints in meeting foreign demand for intermediates.

In terms of trade costs, the results show that SMEs and large firms are equally affected by distance, but SMEs seem to benefit slightly less from common language and contiguity than large firms. The presence of FTAs helps both small and large firms sell in foreign markets. Bilateral internet connectivity is also found to be especially important for helping small firms reach foreign customers. There is a small negative impact for large firms as a result of higher tariffs at destination countries but not for smaller firms, perhaps reflecting that smaller firms tend to trade with neighbouring partners where there are already preferences.³⁵

In terms of foreign direct investment, as expected, both small and large firms export more towards destinations that have growing FDI inflows. However, the results also show that inwards FDI reduces SME sales via export but increases large firm sales via exports. This, again suggests

³⁵ The coefficient on tariffs should be interpreted with caution, the value added sold for foreign production in a particular sector could be embodied in the gross exports of products in other sectors of activity. This means that measures such as the tariff faced in the operating sector might not adequately reflect the tariff faced at the destination market.

interesting dynamics relating to the trade-investment interdependencies taking place. It may be that high FDI inflows imply that SMEs specialise in serving domestic firms in exporting intermediates.

Indonesian firm-level data helps provide more granularity on the firm characteristics and policies that determine the propensity to export directly (Table 2), reducing some of the complications that arise from using value added data but restricting the analysis to exports of both final and intermediate goods. The results show that, at the firm level, foreign ownership and importing are key determinants of direct export propensities in both SMEs and large firms. For example, for SMEs, a one percentage point increase in foreign ownership increases the probability of exporting by 2.3% (evaluated at the mean). At the same time, a one percentage point increase in the use of imported inputs also increases the probability of exporting but by a much higher 15%. These results complement those above and underscore the importance of taking a tiered approach to the analysis. Indeed, at this higher level of granularity, the result highlight how input benefits from GVCs, discussed in previous sections, can be leveraged to engage in export markets. As expected, other important determinants, such as productivity and firm size are conducive to higher export propensities.

The results also show that domestic infrastructure and customs procedures are important: higher performance increases the export propensities of both large and small firms. Measures related to time to export also show the expected results, with an increase in the time to export reducing export propensities. In addition, the presence of NTMs appears to have a negative effect on the propensity of both SMEs and large firms to export directly (see Section 5 for a more in-depth analysis).

Table 2. Determinants of direct export propensity across firm size in Indonesia

	(1)	(2)	(3)	(4)
Variables	Large		SME	
Share owned by foreign	1.015*** (0.001)	1.015*** (0.001)	1.023*** (0.001)	1.023*** (0.001)
Log of imported inputs	1.158*** (0.027)	1.158*** (0.027)	1.154*** (0.014)	1.154*** (0.014)
Log of TFP (Olley-Pakes)	1.089 (0.058)	1.089 (0.058)	1.363*** (0.043)	1.363*** (0.043)
Capital - Labour ratio	1.074*** (0.020)	1.074*** (0.020)	1.006 (0.011)	1.006 (0.011)
Number of workers	1.211* (0.140)	1.211* (0.140)	1.262*** (0.081)	1.262*** (0.081)
Number of workers squared	1.197*** (0.065)	1.197*** (0.065)	1.352*** (0.042)	1.352*** (0.042)
Infrastructure (WEF)	0.859 (0.345)	2.356*** (0.226)	0.800 (0.173)	1.620*** (0.081)
Tariff preference	1.150 (0.272)	1.150 (0.272)	1.145 (0.130)	1.145 (0.130)
NTM	0.454*** (0.079)	0.454*** (0.079)	0.503*** (0.072)	0.503*** (0.072)
Time to export		0.930** (0.030)		0.950*** (0.016)
Customs procedures	3.363** (1.784)		2.334*** (0.662)	
Observations	8,052	8,052	40,606	40,606
Sector FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Firm FE	NO	NO	NO	NO

Note: Value show log-odds ratios.

Source: Authors' calculations based on Indonesian firm-level data.

Overall, the firm-level data confirms many of the findings from the gravity model and the literature review: productivity and firm size are important determinants of SME participation in export markets. They also show that input gains from GVCs can be leveraged to increase the propensity to export directly. Moreover, the external environment is important: good infrastructure to get products to the border and efficient customs procedures to clear products also affect SMEs engagement in export markets.

A number of additional barriers that cannot be captured in the econometric exercise (Figure 25) can be identified from the OECD-UNIDO Thai Enterprise Survey. For SMEs, the most frequently reported barriers to exporting are the difficulty in finding partners (reported by 44% of firms) and distribution channels abroad (reported by 33% of firms). Other key barriers, which also concern large firms, are the difficulty in complying with standards and regulations in foreign markets, import tariffs in foreign markets and foreign exchange volatility. Moreover, GVC participation rates are much lower outside of the capital city (Annex D).

Figure 25. Barriers to exporting for Thai firms in manufacturing sectors

Note: This figure presents the share of firms that report a given barrier to export. The figure is based on a sample of 154 SMEs and 81 large firms.

Source: OECD-UNIDO Thai Enterprise Survey.

4.3.3. Indirect exports

Another channel through which SMEs may integrate into GVCs is through the sale of intermediates to other foreign-owned or domestic firms that then export. As highlighted in Section 2, this channel of participation is often one of the main pathways for SMEs in exporting sectors traditionally associated with strong GVC activity (as is the case of motor vehicles or electrical and optical equipment as highlighted in Lopez-Gonzalez, 2017).

The determinants of indirect exports will differ somewhat from those of direct exports, especially in terms of the role of domestic policies. Indeed, the ability to create domestic linkages for exports will depend less on trade costs and more on the extent to which domestic connections can be made. Unfortunately, specific data on such domestic policies is more difficult to come by and hence the analysis can only focus on a reduced set of determinants.

Nevertheless, the results reveal new and important observations on the determinants of indirect exporting (Table 3). First, they show that SMEs are able to overcome capacity constraints by linking with larger firms. Indeed, large firm output is a more important determinant of indirect participation for SMEs than SME output itself. By contrast, large firms rely more on their own output and less on linkages. Second, there is a negative relationship between foreign sourcing and indirect participation for SMEs. This suggests that SMEs may be relying on intermediates from the firms that they are linking with rather than purchasing these from abroad.

Finally, contract enforcement, a measure correlated with the domestic environment, is key for SMEs. Strong institutions are needed for SMEs to be able to link with domestic firms for further export.

In sum, while there are many difficulties in undertaking an analysis of the determinants of indirect exporting, the results show that there are very strong domestic interdependencies. Smaller firms really do depend strongly on other firms to engage in indirect exports and their ability to do so depends strongly on an enabling domestic environment that allows contracts to be successfully enforced.

Table 3. Determinants of indirect exports
By firm type

Variables	SME	Large
Firm Output (net of direct or indirect exports)	0.463** (0.179)	0.754*** (0.197)
Imports	-0.253** (0.111)	-0.131 (0.184)
Contract Enforcement	-1.155** (0.532)	0.601 (0.515)
FDI inflows	-1.047*** (0.337)	0.570* (0.307)
Time required to start a business	-1.076 (2.474)	1.741 (1.529)
Output of Large firms in Sector	0.707*** (0.124)	
Output of SME in Sector		0.554*** (0.101)
Constant	2.794 (7.532)	-1.006 (0.623)
Observations	250	249
R-sq	0.893	0.824
Year FE	YES	YES
Sector FE	YES	YES

Source: Author's calculations.

4.4. Conclusions

While GVC participation is not an end in itself, it has been shown to be linked to desirable outcomes such as growing productivity, sales, upgrading and employment. This means that there is a case for looking at its determinants so as to help policy makers identify how best to promote further SME participation.

The econometric analysis undertaken herein suggests that policy makers might want to prioritise policies that reduce trade costs as a means of better integrating SMEs in GVCs. These hit SMEs harder than they hit larger firms, reducing their ability to gain competitiveness through imports and to export intermediates. In this context, reductions in tariffs or engaging in more, and deeper trade agreements will help. In addition, trade facilitation reforms, might be prioritised. These help both large and small firms, but have stronger positive effects on SMEs meaning that they promote overall efficiency and also level the playing field. Likewise, policies that enable SMEs to better connect with partners, through the use of digital technologies will also help reduce trade costs and promote further integration.

Finally, the analysis also suggests that governments could seek to promote further domestic linkages between small and large firms with a view to increasing indirect exporting for SMEs. This can be done, amongst other things, by creating an enabling domestic environment through, for example, improving the ability to enforce contracts.

5. How do NTMs and RoO affect SME participation?

Non-tariff measures (NTMs) and Rules of Origin (RoOs), although not barriers per-se, can be particularly onerous for SMEs, in particular given their lack of resources to comply and to adapt production to different requirements. This section shows that higher NTMs and greater regulatory divergence reduce the likelihood and value of SME participation in GVCs. It also shows that SMEs that face multiple types of product specific RoOs have a lower propensity to export, and that restrictive RoOs reduce the probability of SMEs engaging in exporting and importing within GVCs. These findings suggest that ASEAN countries might want to promote further ASEAN-wide harmonisation of regulations and adopt more flexible RoOs in their trade agreements to promote further insertion of their SMEs in GVCs.

5.1. Introduction

Non-tariff measures (NTMs) and rules of origin (RoOs) are two important trade-related policies affecting SME access to both import and export markets. As a result, these are likely to have implications for the benefits SMEs are able to draw from GVCs.

NTMs relate to different (non-tariff) policy measures affecting trade in goods. They are becoming increasingly important in a world of GVCs (see Baldwin, 2016 and World Bank et al., 2017). NTMs can affect SME integration into GVCs either negatively, by inflating the costs of engaging in export and import markets, or positively, by helping SMEs signal the quality of the products they produce and of the intermediates they import.

RoOs are used to establish the national origin of a product, which in turn influences the import treatment of that product in terms of duties and restrictions. More particularly, preferential RoO determine whether a product is eligible for preferential access in countries that belong to a free trade area (FTA) or maintain preferential schemes.³⁶ They prevent products from non-member countries entering a duty-free zone through the country with the lowest external tariff or products from non-eligible countries benefitting from established preferences in the destination country. These RoOs may increase the cost of both importing and exporting with diverse implications for SME, their integration into GVCs and the benefits they draw from regional or other preferences.

This section explores the role of these specific trade-related policies on SME participation in GVCs in the region. The next section discusses the presence of NTMs in the region and the role these play as determinants of SME participation in GVCs. Section 3 then investigates how preferential RoOs affect SME participation. The final section concludes, offering some policy implications.

5.2. How do non-tariff measures affect ASEAN SMEs?

While tariff rates have fallen considerably across ASEAN countries, in part owing to regional integration initiatives, the number of NTMs has grown – from 1 634 measures in 2000 to 5 975 measures in 2015 (Box 6).³⁷ Although NTMs are not meant to discriminate against imports – they usually apply to both domestically produced and imported products – they can have negative

³⁶ They can also condition the application of other trade provisions, such as quantitative restrictions, anti-dumping or countervailing duties, or the elaboration of trade statistics (non-preferential RoOs).

³⁷ See <http://asean.i-tip.org>.

effects on production and trade. They can not only increase production costs, by increasing product standard-related compliance costs, but they may also increase the costs of importing, by requiring inspection and testing that lead to additional costs and delays.

Box 6. Non-tariff measures (NTMs)

Non-tariff measures refer to all measures affecting trade flows that are not tariffs. They take many forms and fulfil a broad range of objectives, some trade-related, others not.

Two different types are usually distinguished. The first, often referred to as “technical” measures, includes primarily sanitary and phytosanitary (SPS) and technical barriers to trade (TBT) measures. The second type, often referred to as “non-technical” measures, includes quantitative restrictions (QRs), forced logistics or distribution channels, price measures and so forth.

- Technical measures: there are as many as 34 different types of SPS measures and 24 types of TBTs.
- Non-technical measures: there are 5 different types of BCM (border-control measures such as pre-shipment inspection) and 28 types of QRs (quantitative restrictions such as non-automatic import licensing, quotas, etc.).

Annex Table F.1 provides a detailed list of the 91 types of measures identified for this report.

NTMs can be particularly burdensome for SMEs which often lack resources to comply or to adapt production to different requirements (or which have a lower capacity to absorb the costs of delays to their imports). Indeed, using firm-level data, Fontagné et al. (2015) show that sanitary and phytosanitary (SPS) measures increase compliance costs and inhibit market entry, especially for smaller firms.³⁸ More recently, Fugazza et al. (2018) show that new non-tariff measures in export markets lead to lower export values and a higher probability of stopping to export for smaller exporters.³⁹

However, NTMs can also have positive effects on trade. For instance, Cadot et al. (2018) show that NTMs can be market-creating “catalysts”, especially in the presence of asymmetric information (see e.g. Henson and Jaffee, 2007; Maertens and Swinnen, 2007; Xiong and Beghin, 2014). When the quality of suppliers is unknown to buyers, as is often the case with less experienced SMEs, regulations and standards can help firms signal that they conform to certain quality requirements, thereby stimulating demand for their products.

5.2.1 Technical NTMs are most widespread in the region

The presence of NTMs varies considerably both within ASEAN countries and across different partner regions (Figure 26).⁴⁰ Technical barriers, such as SPS and TBT, tend to be the most widespread forms of NTMs; however, in ASEAN countries, especially Cambodia, the Philippines, Myanmar, Lao PDR and Indonesia, a large number of non-technical barriers such as

³⁸ Restrictive SPS not only reduce existing trade flows, they also affect market participation and prices, even more for SMEs which can less easily overcome the fixed or variable cost of an SPS measure, as suggested by theory (Bloom et al., 2010).

³⁹ The reverse is true for large exporters, which benefit from those more stringent market-access barriers that hurt the SME competitors.

⁴⁰ Various approaches can be used to identify the importance of non-tariff measures. These include using simple inventory measures; computations of price gaps; and/or estimations of ad-valorem equivalents. One of the most simple inventory measures follows the MAST (Multi Agency Support Team) NTM classification providing a basic index that identifies the share of imports in the countries subject to one or more NTMs.

quantitative restrictions (largely in the form of licensing), or border control measures are also present. These non-technical measures are unlikely to result in positive effects on trade and are therefore often considered to be barriers (see Cadot et al., 2018).

Figure 26. Coverage ratio for four types of NTMs in 2015

Note: The coverage ratio refers to the share of imports subject to at least one or more NTMs.

Source: OECD calculations based on MAST database.

5.2.2 The accumulation of NTMs may be especially burdensome for SMEs

Higher compliance costs can also arise from the accumulation of different non-tariff measures on a single product. For instance, a can of tuna could be subject to a specific sanitary standard (SPS), a technical measure related to the fishing method (TBT) and several licensing requirements (QRs). The greater the number of NTMs applied to a single product, the higher the burden of compliance for SMEs, especially those with a lower scale of operations.

The average number of NTMs applied to products in ASEAN countries varies widely (Figure 27a). Products sold in Malaysia face, on average, two NTMs, one SPS and one TBT, while products sold in the Philippines face six NTMs on average, including two different SPS and three different TBT measures. Also relevant for ASEAN SMEs is the number of NTMs that their exports need to meet in other countries (Figure 27b). These range from an average of four in China to an average of nearly 12 in the United States. SMEs will need to ensure that their products meet these requirements in order to access these markets. They are likely to find it most difficult to export to destinations where there are more NTMs.

However, SMEs and large firms do not always operate in the same sectors, meaning that they will face different numbers of NTMs abroad (Figure 28). In some ASEAN countries, SMEs specialise in export sectors that face fewer NTMs abroad. For example, in Cambodia, SME exports are in sectors which, on average, face one NTM (generally a TBT). By contrast, large firm exports can face an average of six NTMs, most of which are TBTs. In Indonesia, Malaysia and Viet Nam, SMEs also operate in sectors tending to face fewer NTMs than larger firms. However, in other countries such as Thailand or Lao PDR, SMEs operate in sectors that face similar numbers of NTMs. Only in the Philippines do SMEs operate in sectors where smaller firms might face more NTMs.

Figure 27. Average number of NTMs per product in 2015

Note: The figures capture the average number of NTM types applied to a single product.

Source: OECD calculations based on MAST database.

Figure 28. Potential number of NTMs faced by exports

Note: Values identify the average number of NTMs applied abroad in the sectors of operation of firms of different size.

Source: OECD calculations based on MAST database and World Bank Enterprise Survey.

5.2.3 Higher NTM costs reduce the probability of exporting and importing in SMEs

The NTM costs, or their ad-valorem equivalent (AVE), will also matter for SMEs trying to import or export (Figure 29). Indeed, the higher the cost of complying with the measure, the stronger the impact: ASEAN SMEs that face a higher AVE NTM abroad have a lower propensity to export and import.⁴¹ This seems to be the case particularly when confronted with the AVE of SPS measures and Quantitative restrictions in export markets (estimated by Cadot et al., 2018). For

⁴¹ Results from a cross-sectional estimation using World Bank Enterprise Survey data and the *ad valorem* equivalents (AVEs) estimated by Cadot et al. (2018). See Annex F for further details.

imports, the rising cost from NTMs also reduces the probability of SMEs engaging in importing activities, in particular in the case of TBT and QRs measures.

Figure 29. Impact of ad-valorem equivalents of NTMs on the probability of ASEAN SMEs to trade

Note: The figure shows significant standardised coefficients from a probit regression. White bars identify non-significant coefficients. See Table in Annex Table F.3. for overall results.

Source: OECD calculations based on AVE of NTMs estimated in Cadot et al. (2018) and World Bank Enterprise Survey.

5.2.4 The impact of NTMs on SME participation in GVCs

Identifying the impact of NTMs on SME participation in GVCs is difficult due to data constraints. While the database created for the purposes of this project has partly addressed the constraint of identifying the extent of SME participation, there is little systematic information on the presence of NTMs in the region sufficient for a more robust estimation of the impacts.⁴² One way of overcoming this issue is to use a database of Specific Trade Concerns (STC) raised at the WTO on issues related to TBT and SPS⁴³, even if this database is not systematic, and therefore does not identify all TBT and SPS measures. This might mean that it captures the most trade distorting measures but also that it might miss some measures of specific importance to SMEs.⁴⁴

With this in mind, the econometric analysis reveals that the presence of NTMs notified at the WTO has a significant impact on SME participation in GVCs (Figure 30). This is most evident in terms of exports where the presence of NTMs in destination countries reduces the value of intermediates sold into GVCs of both large and small firms. The impact appears to be somewhat

⁴² The data documented earlier – MAST data – was available only for one year (2015) which does not overlap with the data on SME participation in GVCs. Moreover, more robust estimations can be achieved using data that have a cross-sectional and time element.

⁴³ However, while the STC information is available for the entire period of analysis, it covers only technical barriers (SPS and TBT) and measures which are raised by other WTO members.

⁴⁴ The nature of the bias is hard to identify as it depends on the types of measures that are reported most.

larger for SMEs, confirming recent empirical studies that find a more restrictive effect of SPS or TBT measures in external markets for SMEs. The number of STCs raised also has a negative effect on GVC integration of large firms via imports, although surprisingly not for SMEs. A plausible explanation here could be that large companies (who can lobby) are more effective in ensuring that the technical barriers which impede trade among large firms are well captured in specific trade concerns at WTO.

Figure 30. NTM impact on GVC integration

Note: The figure shows significant standardised coefficients from a gravity regression. White bars identify non-significant coefficients. See table in Annex Table F.4. for overall results.

Source: Authors' calculations.

5.2.5 Regulatory distance

A growing body of evidence suggests that regulatory convergence – or reductions in regulatory heterogeneity – can decrease some of the trade costs associated with non-tariff measures (Cadot and Gourdon, 2016). Regulatory heterogeneity, even if regulations address similar objectives, can create a cost for firms selling in multiple markets. For example, Fontagne and Orefice (2018) show that the negative effect of TBT measures on exports is magnified in the case of multi-destination firms and can divert exports towards TBT-free destinations.

To explore the effect of regulatory distance for ASEAN countries, this section uses a product-level index of regulatory distance derived in Cadot et al. (2018). It identifies the share of 'similar' regulations, or the overlap in regulations between two partners over the same products.⁴⁵

The results show that ASEAN countries are more similar to each other than they are to other countries in their application of technical measures (Figure 31). On average, there is an overlap in 32% of regulations between ASEAN partners. By contrast, only 18% of their regulations are similar to those applied by non-ASEAN partners. This would suggest that SMEs in the region might struggle more to export to non-ASEAN markets than to ASEAN partner countries. However, while the gap is lower with respect to ASEAN countries, continued efforts towards

⁴⁵ The index covers SPS and TBT measures only and is calculated at the most detailed level of aggregation (see Annex F.4. for details). It captures whether or not country pairs adopt similar types of regulations on a specific product.

regulatory alignment are still needed. Indeed, more than 70% of technical regulations in Viet Nam, Cambodia, Singapore and the Philippines are still not aligned with other ASEAN countries.

Figure 31. Similarity index between partners in 2015

Note: The index give the percentage share of similar regulation, see Annex F for details.

Source: OECD calculations based on MAST database.

A last exercise to help understand the role of NTMs is to assess the impact of regulatory distance in technical barriers using the indicator described earlier (Figure 32). As expected, regulatory distance has a negative effect on SMEs in their GVC integration through imports.

Figure 32. Regulatory distance effect on GVC integration

Note: The figure shows significant standardised coefficients from a gravity regression. White bars identify non-significant coefficients. See table Annex Table F.5. for overall results.

Source: Authors' calculations.

Collectively, these findings suggest that technical regulations often act as barriers to GVC integration of ASEAN firms; however, they affect SMEs and large firms differently (on both GVC integration types). In particular, an interesting outcome from the work is that there seems to be a strong and SME-specific negative impact of regulatory distance. This suggests that there might be room for promoting further ASEAN-wide harmonisation of regulation to facilitate further SME integration into regional value chains.

5.3. How might the evolving Rules of Origin environment affect ASEAN SMEs?

RoOs are critical components of Free Trade Agreements (FTAs) (Box 7). They are designed to stop products coming into an FTA through the partner that applies the lowest tariff, a phenomenon known as trade deflection. While RoOs are necessary, complex RoOs may undo the benefits of trade agreements (Cadestin et al. 2016) and can be especially burdensome for SMEs. Indeed, according to ITC (2015), RoOs have emerged as one of the most problematic forms of non-tariff measures faced by SMEs in developing countries.

Box 7. What are Preferential Rules of Origin

Preferential RoOs establish the conditions that a product must meet to be eligible for preferential access in countries that belong to a free trade area (FTA) or maintain preferential schemes (Generalised Systems of Preference– GSP). These conditions prevent products from non-member countries entering a duty-free zone through the country with the lowest external tariff, a phenomenon known as *trade deflection*, or products from non-eligible countries benefitting from GSP preferences.

In order to determine the country of origin of a given product, RoOs apply different types of *product-specific rules* (PSRs):

- The rule of *wholly-obtained* products specifies that the country of origin of a product is the country where the commodity has been wholly produced (or grown, harvested or extracted for non-manufactured products). In this case, the origin requirement is met if a product or commodity does not use any foreign components or materials.
- The rule of *substantial transformation* specifies that the country of origin is the country where the last substantial transformation took place, and this transformation must be sufficient to give its essential character to a commodity. There exist three distinct sets of criteria to express “substantial transformation”:
 - *Change of tariff classification* (CTC), which can be at the Chapter (CC), Heading (CH), or Subheading (CS) level (referring to different levels of a tiered tariff classification). Exceptions can be attached to a particular CTC requirement, generally prohibiting the use of non-originating materials from a particular HS subheading, heading, or chapter for goods supposed to qualify via CTC.
 - *Value Content Requirement* (VC), based on the value of added materials, with different methodologies depending whether the focus is on the originating or the non-originating materials.
 - *Technical Requirement* (TR): such as a chemical reaction.

These three substantial transformation criteria are used in existing trade agreements either as stand-alone criteria, in combination with other criteria (“and”), or as alternative criteria (“or”).

Although different FTAs or GSPs may have the same PSRs, the effect on trade may differ depending on the type of *regime-wide provisions*.

- The *certification* and customs procedures determine how meeting a specific rule is *demonstrated and verified* in terms of the required documents and the applicable customs procedures. The various preference schemes define different procedures for certification of origin and establish a system of checks on the authenticity of claims for preferential treatment.

- *Cumulation* refers to a diverse range of provisions which allow producers counting materials purchased from outside of the FTA area or the GSP-eligible country as originating in the area or the country for the purpose of determining origin. Cumulation schemes can differ with respect to the third parties with which cumulation is possible (the so-called 'quantitative' cumulation aspect) and with respect to the process and additional requirements for cumulation ('qualitative' aspect).
- Detailed testing of the source of inputs can influence the restrictiveness of the origin rules. *Tolerance or de minimis rules*, for example, stipulate the conditions for the use of materials supplied by third parties and are usually expressed as a maximum percentage of non-originating materials. Similarly, the *absorption principle*, permits maintenance of the originating status of intermediates used for subsequent manufacturing operations of originating goods and disregards all former non-originating inputs contained in the intermediates.
- Other key aspects of regime-wide RoO are the *duty drawback* mechanisms which allows tariffs due on imported materials used in the production of export items to be waived or refunded; the concept of *fungible goods* which allows for joint storage of originating and non-originating inputs when these inputs are interchangeable for commercial purposes; and *advance rulings*, which are binding official decisions providing the applicant with a determination of the origin prior to an import or export transaction for a specified period.

Source: Angeli et al. (2019).

There are three main concerns related to RoOs:

- Their *restrictiveness*: overly complex RoOs can nullify trade liberalisation benefits arising from tariff concessions by making it difficult for firms to prove compliance with preferential access requirements.
- Their *heterogeneity*: if a country applies different RoOs regimes across different preferential agreements, producers may have to split production and use different input mixes to export to different partners. Alternatively, if unable to do so, they may have to concentrate exports towards markets with less restrictive RoOs.
- Their *impact on sourcing*: RoOs can constrain sourcing decisions and prevent final producers from choosing the most efficient input suppliers from around the world.

While recent work suggests that RoOs may restrict both the sourcing and selling choices of firms, an important question is whether these restrictions affect GVC participation differentially across firms of different sizes. Anecdotal evidence shows that many SMEs face considerable compliance costs to fulfil RoO certification requirements, which prevent them from using preferences in trade agreements (ITC, 2016). Resource-constrained SMEs unable to face compliance costs will have to forego preferential access for their exports of intermediates towards regional markets, facing a competitive disadvantage with respect to larger firms when selling *directly* into GVCs.⁴⁶

RoOs may also reduce the capacity of SMEs to engage in GVCs through imports. For example, if RoOs impose local content requirements to establish originating status, the sourcing choices of SMEs will be reduced, since they may need to rely on more expensive domestic intermediates for production. In turn, this may deny them some of the input benefits associated with GVC participation (see Section 3). But there is also the possibility that such local content rules induce

⁴⁶ Brenton (2003) shows that cumbersome administrative requirements in RoOs also prevent exporters in least developed countries from benefiting from preferential access.

large firms to increase their domestic sourcing. While this may come at the cost of input benefits, it could lead to higher demand for intermediates from domestic firms, including SMEs.⁴⁷

An open question is also how to better align the legitimate practice of curbing trade deflection with the reality of a GVC world. One possibility is to introduce flexibility through general “regime-wide” rules for RoOs (Box 7), such as higher *de minimis* levels, *flexible cumulation* rules or allowing *self-certification* to reduce administrative burdens.

The next section reviews the incidence and restrictiveness of different types of product specific rules (PSRs) in ASEAN agreements. This is followed by a discussion of the emerging ‘noodle bowl’ of RoOs regulations in the region. A review of the flexibility introduced into different agreements through regime wide rules is then provided. The last section then assesses how different RoOs characteristics affect SMEs’ integration into GVCs.

5.3.1 Product Specific Rules and their restrictiveness

The share of goods covered by product specific rules in ASEAN FTAs varies considerably across agreements (Figure 33).⁴⁸ There are fewer restrictive rules applicable to preferential East Asian partners than there are with respect to other preferential partners. Indeed, ASEAN countries tend to provide flexibility (use of the word “or”) in their RoOs with East Asian partners such as China, Japan or Korea. By contrast, there is a higher propensity to add complexity by cumulating requirements (use of the word “and”) in agreements with other partners. ASEAN countries also have fewer restrictive exceptions in their CTC rules with other partners. That said, they tend to include more technical requirement (TR) type tests, considered highly restrictive, in their FTAs with East Asian partners relative to the rest of the world.

Value content measures – which require certifying how much content is domestic – appear to be less widespread in ASEAN FTAs, regardless of the partner country. This is likely to be a good thing for SMEs. Large firms are more likely to have more sophisticated inventory control and accounting systems allowing them to easily measure and report the origin of value content, whereas smaller firms with smaller operations are unlikely to be able to justify the expense of deploying such systems, making it more difficult to demonstrate origin. SMEs are likely to find it easier to demonstrate origin through rules such as change of classification (CTC type).

⁴⁷ Bombarda and Gamberoni (2013) reject the argument that restrictive RoOs can lead to productivity and trade gains by forcing exporters to move up the value chain; on the contrary they found that relaxing RoOs restrictiveness will boost competitiveness among exporting firms and then force the least productive exporters to exit the market.

⁴⁸ The analysis uses a restrictiveness index for different types of PSR detailed in the annex and based on existing literature in Estevadeordal and Suominen (2008), and Harris (2007).

Figure 33. Frequency index of different PSR by agreement

Note: CC is change in chapter/ CH is change in heading/ CS is change in subheading/ VC is value content/ TR is technical requirement/ WO is wholly obtained/ EXC is exception.

ASEAN groups all ASEAN countries and East Asia (EA) groups China, Korea, Japan, Singapore and Hong-Kong, China.

Source: OECD calculations.

A summary measure of the average restrictiveness of RoOs across different agreements for firms of different sizes can be obtained by combining firm level information from the World Bank Enterprise Survey with product level data on the degree of RoO restrictiveness using an index in the vein of Harris (2007) (Annex F). The results show that, on average, FTAs in the region (with any partner) tend to be more restrictive for large rather than small companies.

In terms of the restrictiveness across different agreements (Figure 34), it is clear that the ASEAN Trade in Goods Agreement (ATIGA), which was implemented in 2010, introduced improvements in RoOs by significantly simplifying the previous RoOs set in the ASEAN Free Trade Area (AFTA) implemented in 1993. However, mixed results are found for the ASEAN region with respect to agreements with third parties. For instance, RoOs for SMEs seem more flexible with Australia and New Zealand, but are relatively more restrictive with Korea or Japan, and most of all with China. For bilateral trade agreements, a clear pattern emerges: agreements with Malaysia seem to adopt more liberal RoO for SMEs than those with Thailand.

Figure 34. Restrictiveness index of PSR for SMEs

Note: The PSR index calculated at HS6 digit level and based on the restrictiveness index in Annex F is displayed as an average across all products for each RTA. The higher the index the more restrictive the PSR.

Source: Authors' calculations.

5.3.2 Noodle bowl effect

RoOs differ widely among FTAs, creating a 'noodle bowl' effect that makes it difficult for exporters and importers to identify and adapt to different regulations across agreements. This can lead to rising costs when engaging in export markets, costs which SMEs tend to be less well prepared to face. A significant consequence of divergence in RoOs across agreements is that an exporter may have to maintain different parallel production processes in order to comply with different RoOs. It is possible that the compliance and administrative costs of membership of multiple agreements amount to more than the sum of the costs of individual agreements. This would be the case to the extent that membership of multiple agreements involves additional coordination effort.

The divergence of RoOs across countries can be captured by computing a PSR heterogeneity index following Angeli et al. (2019) – Figure 35 (see Annex F for details).⁴⁹ It captures the average number of different RoOs which apply to a product in a country due to the existence of multiple FTAs with different product specific rules. A higher degree of restrictiveness occurs when a product faces different RoOs across agreements. Membership to multiple agreements that use dissimilar rules is therefore considered more restrictive, while membership to only a single agreement is considered the least restrictive according to this criterion.

The results for the ASEAN region show that the RoOs that large firms face in export markets tend to be more complex than those of smaller firms. There are two exceptions: Myanmar and the Philippines. Although these have fewer FTAs than Malaysia or Indonesia, they nonetheless have a higher index for SMEs, possibly indicating that their FTAs involve countries with different types of PSR.

Interestingly, for countries such as Cambodia, Malaysia and Laos, there is a big wedge between the heterogeneity in PSR faced by large exporters versus SMEs. This could suggest that SMEs

⁴⁹ Using the World Bank Enterprise Surveys, Figure 35 maps the heterogeneity in the PSR index of FTAs based on the share of exports across ASEAN countries for SMEs and large exporters.

struggle to enter export markets where heterogeneity of PSR is high and thus concentrate in industries in which PSRs are more similar across FTAs.

Figure 35. Heterogeneity score of PSR across FTAs for SMEs

Note: The Heterogeneity score is calculated at HS6 digit level as in Annex F is displayed as an average across all products and FTAs for each country.

Source: Authors' calculations.

5.3.3 Regime-wide RoOs restrictiveness in ASEAN

The potential restrictiveness of RoOs may also be found in *regime-wide* RoOs (measures that apply to all products). Different types of regime-wide rules in FTAs generate different compliance costs for SMEs competing for market shares. This section identifies how ASEAN agreements perform relative to other East Asian agreements and the rest of the world (figures are displayed in Annex Table F.6.). Much of the analysis relies on an index of restrictiveness of regime-wide provisions (detailed in Annex Table F.7.).

Certification

ASEAN FTAs appear quite restrictive in most aspects of origin certification (Figure 36). Self-certification, which can lower the costs of obtaining certificates of origin (identified as the most important NTM measure affecting SMEs that export in the ITC 2016 survey), has not been adopted in intra-ASEAN FTAs.

The validity period of origin certificates is also inferior to one year on average for ASEAN FTAs, despite the fact that longer periods can help reduce the burden of renewals and can cover several export transactions. By contrast, validity is 14 months on average for East Asian FTAs. This could be particularly problematic for SMEs in ASEAN which would need to renew certificates more often, adding to costs.

Exemptions, which could also help ease the potential restrictiveness of RoOs, allowing SMEs to forego complicated RoOs certification processes for small parcel exports if the threshold for exemptions is sufficiently high, are sparsely used in ASEAN FTAs: the ASEAN threshold for exemptions (USD 650) is much lower than in EA (USD 1 000) and other regions (USD 1 300). Another avenue for minimising costs could be allowing for the correction of minor errors found on the certificate of origin, instead of requiring that a new certificate is issued. Lastly, ASEAN FTAs rely significantly more on direct verification of certification, which is arguably more burdensome for SMEs.

Overall, ASEAN FTAs appear significantly more restrictive in their certification process than non-ASEAN FTAs. This is likely to affect SMEs' ability to benefit from FTAs negotiated by ASEAN countries. However, as shown in Figure 36, there is wide heterogeneity in restrictiveness across different ASEAN FTAs. That said, the more recent ATIGA appears more flexible to the original AFTA agreement.

Figure 36. Restrictiveness index on certification process

Note: The index calculated as in Annex F is displayed for each PTA, the higher the index the more restrictive the PSR.

Source: Authors' calculations.

Cumulation

Cumulation rules may be particularly problematic for SMEs; when they are so technical and inflexible as to be impossible to follow by small firms without access to specialised consulting firms for advice. Cumulation rules allow producers in one country to source parts and inputs from other countries without losing the originating status of the resulting products. ASEAN FTAs have made a significant move toward full (ASEAN-wide) cumulation compared to other FTAs, although bilateral cumulation is still more common.

The *de minimis* rule, also called tolerance rule, determines a value threshold for the incorporation of materials supplied by third countries. The absorption rule also brings flexibility as it allows use of more non-originating input. Use of this varies across FTAs, and is less common in EAP and ASEAN than in other regions.

Overall, ASEAN FTAs offer flexibility in terms of the types of cumulation allowed but less so in terms of the adoption of absorption rules. Figure 37 below indicates that this lack of absorption rules is less a problem of FTAs negotiated by ASEAN as a whole than of bilateral agreements of individual ASEAN countries.

Figure 37. Restrictiveness index on cumulation rules

Note: The index calculated as in Annex F is displayed for each RTA. The higher the index the more restrictive the PSR.

Source: Authors' calculations.

Other aspects

Additional provisions can help give more flexibility to the RoO regime for SMEs. For instance, duty drawback schemes selectively lower the cost of inputs used to produce goods for export and can therefore be especially important for GVC participation through sourcing or selling intermediate goods outside regional trading areas. Several FTAs do not allow duty drawback, raising the cost of exporting to member economies and encouraging firms to purchase inputs from potentially higher-cost local sources. ASEAN countries often prohibit duty drawbacks in their trade agreements, which could increase the cost of exporting for SMEs.

Additionally, allowing the fungibility of goods/material enables tracing of the origin of the fungible input materials, without having to physically segregate stocks of non-originating and originating materials. Most of the FTAs in ASEAN and East Asia regions (85% and 95% respectively) offer this flexible option, while it is less common in FTAs in other regions (65%).

Overall, with respect to these other aspects, ASEAN still has scope for further improvement, especially in relation to duty drawback – an issue addressed in the recent ATIGA agreement. Moreover, as Figure 38 shows, there is scope for greater adoption of advance-ruling provisions in a significant number of FTAs in the region.

Figure 38. Restrictiveness index on other regime wide provisions

Note: The index calculated as in Annex F is displayed for each RTA. The higher the index the more restrictive the PSR.

Source: Authors' calculations.

5.3.4 The impact of RoOs on SME participation in GVCs

The implications of product specific RoOs and regime wide RoOs for SMEs can be analysed econometrically. First, using the World Bank Enterprise Survey and drawing on Lopez-Gonzalez (2017) and the restrictiveness index of RoOs developed above, the impact of RoO restrictiveness on the probability of SMEs engaging in exports and imports is estimated (Figure 39).⁵⁰ The results show that RoOs have a negative impact on both import and export propensities of SMEs and identify regime-wide measures as most burdensome.

The impact of RoOs on GVC integration of SMEs is then explored (by introducing the indices of RoOs restrictiveness into the estimations undertaken in Section 4).⁵¹ The results show that the restrictiveness of product specific RoOs has a negative impact on both gross exports and integration into value chains via exports (Figure 40). However, regime-wide restrictiveness is not found to be a significant determinant of changes in the value of integration (although it has the expected negative sign). The results do not show a larger negative impact for SMEs.

⁵⁰ The cross-sectional estimations (details in Annex F.10.) identifies the determinants of the propensity for ASEAN SMEs, identified as firms below 200 employees, to engage in exporting and importing activities and the role that facing RoO plays.

⁵¹ The use of such indicators is favoured because it is not feasible to include all the existing RoO provisions (such as type of PSR, different aspects of regime wide provisions, etc.).

Figure 39. Impact of restrictiveness on the probability to engage in exports and imports for SMEs in ASEAN

Note: The figure shows significant standardised coefficients from a probit regression. White bars identify non-significant coefficients. See Annex Table F.7. for overall results.

Source: Authors' calculations using the World Bank Enterprise Survey.

Figure 40. Impact of RoOs restrictiveness on GVC integration

Note: The figure shows significant standardised coefficients from a gravity regression. White bars identify non-significant coefficients. See Annex Table F.8. for overall results.

Source: Authors' calculations.

Taken together, the results highlight that regime wide RoOs can affect the propensity of SMEs to engage in export and import markets and that once participating, more restrictive PSR RoOs mean less exports of intermediates.

5.4. Conclusions

This section highlights the existence of non-technical measures and technical regulations which can act as barriers to GVC integration of ASEAN SMEs. It also argues that large compliance costs might arise from the accumulation of different non-tariff measures and regulatory heterogeneity.

The firm-level evidence shows that, on aggregate, SMEs that face stronger and more numerous NTMs are less likely to export and import. The results also indicate that barriers impact large firms and SMEs differently especially in the case of SME integration into GVCs via exports.

Further analysis would be needed to better identify the different channels of transmission. However, an interesting outcome is the SME-specific negative impact of regulatory distance. There is a growing body of evidence suggesting that regulatory heterogeneity, even when regulations address similar objectives, creates additional costs for firms selling in multiple markets. The results from this section confirm that regulatory distance has a negative effect on SMEs in their GVC integration through imports. This suggests that there is room for promoting further ASEAN wide harmonisation of regulation.

On RoOs, the data highlight the negative impact of restrictive RoOs on SME integration into GVCs, mainly in terms of participation via direct exports. It also shows that there are fewer restrictive rules with respect to East Asian partners than there are with respect to other ASEAN partners. However, diverging RoOs across agreements can also have significant consequences for SME exporters operating in different markets.

The firm-level evidence shows that, on aggregate, ASEAN SMEs that face multiple types of product specific RoOs have a lower propensity to export. Similarly, the adoption of restrictive regime wide RoOs reduce the probability of SMEs engaging in exporting and in importing activity. The results also show that the restrictiveness of product specific RoOs has a negative impact on both gross exports and integration into value chains via exports.

Collectively, these findings suggest that ASEAN countries have room for improvement in the adoption of more flexible RoOs in their different trade agreements. In particular, more flexible product-specific regulations might facilitate further GVC integration by SMEs and large firms through exports.

6. What is the evidence of SME-MNE linkages through GVCs?

Multinational Enterprises (MNEs) play a central role as coordinators of international trade and production networks. This section uses a new dataset to explore the complementarity between SME and MNE economic activity in Indonesia and Thailand, identifying the role of MNEs as suppliers of inputs and as conduits for exports of small domestic firms. The section shows that positive spillovers are most likely to materialise in ‘traditional’ GVC sectors such as computer and electrical equipment or motor-vehicles. However, the importance of vertical linkages varies widely across sectors. A better understanding of the benefits and drivers of these linkages is needed to help SMEs better connect with GVCs.

6.1. Introduction

Inward foreign investment is a key element of GVCs (UNCTAD, 2013:138, OECD-UNIDO, 2019). Multinational Enterprises (MNEs) play a central role coordinating international trade and production networks, engaging with affiliates and independent firms – within and across borders – to leverage cost efficiencies and technological capabilities. As a result, opportunities for smaller firms to benefit from GVCs are also likely to depend on the extent to which SMEs are able to forge domestic linkages with foreign enterprises.

This section aims to shed light on the nature and evolution of such linkages in two ASEAN countries, Indonesia and Thailand. It is complementary to the parallel OECD-UNIDO (2019) report which identifies, at greater length, the different channels through which foreign investment can be leveraged to create opportunities for SMEs in the region. By contrast, this section uses a new dataset to provide a snapshot of the specific trade linkages between SMEs and MNEs, one aspect of this evolving environment.

To unpack these linkages, a further split incorporating the ownership dimensions is made to the augmented Inter-Country-Input-Output (ICIO) table described in Annex B. Foreign-owned firms are identified when the percentage of capital owned by foreign agents is greater than 50%.^{52,53} The new database enables analysis of the value links between SMEs and foreign-owned firms in terms of both input use and output sold (Box 9).⁵⁴

The rest of this section is organised as follows: the first section reviews the literature on the importance of MNEs for the participation of SMEs in international production networks. Based on firm-level data, the second section explores the activity of SMEs and MNEs in Indonesia’s and Thailand’s manufacturing sectors. The third section presents new evidence, based on the ownership split, on the nature and evolution of vertical linkages between foreign firms and

⁵² Information about the percentage of capital owned by foreign agents is only available for two out of the four countries that provided firm-level data, namely Indonesia and Thailand. To date, we are thus unable to implement this procedure for Viet Nam and Singapore.

⁵³ Although majority ownership is a more traditional measure of foreign ownership, some studies identify firms as foreign-owned when a foreign investor owns 10% or more of the assets of the invested entity because this share is considered sufficient to exert control.

⁵⁴ As the share of foreign-owned SMEs is relatively low in the countries for which data are available, our analysis focuses only on three categories: SMEs, large domestic-owned firms and large foreign-owned firms. Data about the distribution of domestic and foreign-owned SMEs in the two countries are available upon request.

domestic SMEs on aggregate and across different sectors. Finally, the last section concludes, providing some observations on what the results entail for policy makers in the region.

6.2. Why do foreign firms matter for SMEs?

There are two broad channels through which SMEs benefit from the presence of large foreign companies: spillovers and linkages (Giroud and Scott-Kennel, 2006).⁵⁵ Spillovers occur as “a by-product of MNE activities in the host country” (ibid). These are the indirect impacts or externalities on host country industries resulting from foreign presence via FDI and MNE subsidiaries (Moran 2001). These spillovers occur through indirect mechanisms (Moran, 2000; Saggi, 2002) and materialise, for example, through demonstration effects – where unrelated local firms imitate the production techniques of MNEs, competition effects, or mobility of trained personnel from and to the affiliates of MNEs.

Linkages differ from spillovers in that they are the direct mechanisms through which foreign firms engage with local counterparts. Two types of linkages can be distinguished: horizontal (or relational) linkages and vertical linkages. Relational linkages refer to collaborative activities between foreign and local firms, typically associated with alliances, equity relationships and other inter-firm network relationships. Examples of such partnerships in ASEAN are provided in OECD-UNIDO (2019:21) and include research collaboration, licensing or joint ventures. Vertical linkages are, in turn, the direct supplier-customer relationship established between local and foreign firms. Backward vertical linkages occur when MNEs source inputs from local companies, while forward vertical linkages occur when MNEs provide inputs to local firms.

The distinction between linkages and spillovers is of interest on empirical grounds. Evidence is supportive of clear positive effects accruing to domestic firms from supplying inputs to MNEs (backward linkages) (Havranek and Irsova, 2011). However, evidence on FDI spillovers remains inconclusive, or even finds negative spillovers on local firms as a result of foreign affiliate activity in developing countries (see Box 8 for a summary of empirical findings).

A further distinction between spillovers and linkages arises from the research methods employed to study their impact. Existing studies on FDI spillovers look at the impact of foreign investment in general rather than disentangling benefits through supply chain linkages, which are typically not observed in the data. By contrast, an emerging literature relies on survey methods to estimate the exact impact of firm linkages on productivity gains (OECD-UNIDO 2019:53-54), and case study approaches are also used to assess the effect of linkages on firms’ performance⁵⁶.

This section contributes to the empirical efforts in this field by using firm-level and inter-country-input-output data to identify the extent to which vertical linkages are taking place between SMEs and MNEs in ASEAN (see OECD-UNIDO, 2019 for a more in depth review of investment related aspects of SME participation in GVCs).

⁵⁵ While this terminology is based on Giroud and Scott-Kennel (2006) and is useful in placing the contribution of this section to the literature, the use of these terms remains disputed. For instance, they are not always distinct categories as might be the case when linkages lead to spillovers through other positive externalities.

⁵⁶ See, for example, Tong and Seric (2018), “Policies for strengthening linkages and spillovers in global value chains: Lessons from Samsung mobile phone production in Viet Nam”, background paper for the OECD-UNIDO project.

Box 8. Spillovers vs. linkages for productivity gains

One of the background papers prepared for the OECD-UNIDO (2019) report, Tong (2018), gathers evidence on the differential impacts of linkages and spillovers on firm performance. For example, vertical linkages may have positive results due to assistance effects – as MNEs transfer knowledge and capabilities to local suppliers to ensure efficiency and quality in inputs (Crespo and Fontours, 2007; Paus and Gallagher, 2008). Similarly, demand effects arise where MNEs increase the demand of intermediate products in quantity or variety, which allows local suppliers in upstream industries to reap the benefits of scale and scope economies (Javorcick, 2008:147).

For vertical forward linkages, availability and quality effects describe how domestic firms in downstream industries become more productive due to access to better and cheaper inputs, manufactured by MNEs. This is particularly the case as intermediate inputs often come with the provision of services that might not be available with sourcing through imports (Javorcick, 2004:608). This notwithstanding the fact that importing foreign inputs also leads to productivity growth, as empirically demonstrated for Indonesia (Amiti and Konings, 2007; Rahardja and Valera, 2015).

A number of empirical studies validate the existence of these demand and assistance effects. For instance, Godart and Gorg (2013) find evidence for demand effects among suppliers in 25 Eastern European and Central Asian countries. In turn, Gorg and Seric (2015) show that supplying MNEs is associated with product and process innovation among domestic firms for 19 African economies. Similar evidence emerges from comprehensive analysis using input-output tables (Gorodnichenko, Svejnar and Terrell, 2014) or meta-analysis of existing studies, although evidence for the positive spillovers of forward linkages is less robust in this instance (Havranek and Irsova, 2011). In addition, studies focusing on the backward effects of FDI on domestic suppliers, again by measuring productivity gains in the manufacturing sector, tend to be supportive of improvements in local firms supplying foreign companies in Indonesia, Lithuania, Zambia, China and 17 countries in Eastern Europe and Central Asia. (IMF et al., 2015:15).

Havranek and Irsova (2011) reject the existence of intra-industry spillovers, echoing similar findings in other studies in developing countries. No intra-industry spillovers across the manufacturing sector are found in Indonesia and Colombia (Blalock and Gertler, 2008; Kugler, 2006), while there is evidence that domestic firms may even experience productivity losses, as competition with foreign firms drives them out of the market (Aitken and Harrison, 1999). Furthermore, studies looking at the variation of productivity growth in manufacturing industries as a result of intensity of FDI find no support for productivity spillovers in manufacturing industries for Morocco, Russia and Venezuela. Instead, and counterintuitively, they all report negative correlations (IMF et al., 2015:15).

This underlines that FDI does not necessarily produce intra-industry spillovers, and that linkages are crucial in how domestic firms stand to gain from foreign establishment. Some studies indeed suggest that some FDI firms might even operate within 'enclaves' with little connections to domestic firms (See, for example, Gallagher and Zarsky (2007), Paus and Gallagher (2008), and Phillips and Henderson (2009) for studies on the lack of vertical linkages in the electronics sector in Mexico, Costa Rica and Malaysia).

Source: Tong (2018) and IMF et al. (2015).

6.3. How is SME and MNE activity evolving in Indonesia and Thailand?

While SMEs in ASEAN countries represent the majority of enterprises, they make up the lowest share of value added (see Section 1). By contrast, MNEs tend to be a minority in terms of numbers (less than 5% in Indonesia and less than 1.5% in Thailand), but occupy a sizeable share of value added (around 25% in Indonesia and 13% in Thailand) – Figure 41. However, despite a relatively stable distribution in the number of firms, the share of foreign-owned firms in total value-added contracted from around 40% in 2008 to 33% in 2012 in Indonesia and from about 30% to 13% during a similar period in Thailand. In Indonesia, large domestic firms gained the most, growing at a faster pace than foreign owned firms. In Thailand, domestic SMEs grew fastest.⁵⁷

⁵⁷ The firm level data actually suggests that MNEs registered a decline in their net value-added contribution.

Figure 41. Distribution of firms by category

Source: Own calculations using firm level data.

However, MNE activity varies significantly across sectors (Figure 42). In both Indonesia and Thailand, foreign companies concentrate in high-tech sectors such as Machinery and equipment, Computer, electrical and optical Equipment, and Motor Vehicles. In Indonesia they occupy more than 50% of total sectoral value added while in Thailand MNEs occupy a more modest 30% of total value added in these sectors. Large domestic firms and SMEs, instead, generally dominate lower tech sectors such as food products, wood products and mineral products.

Figure 42. Distribution of value-added by sector, 2012**a. Indonesia** **b. Thailand**

Source: Own calculations using firm level data.

Depending on the sector, MNE activity either complements or substitutes SME activity. For instance, changes in the value added of domestic SMEs and MNEs in Indonesia are positively correlated in typical “GVC sectors”, like Motor vehicles, Computer and electrical equipment, Machinery and equipment and Electrical Machinery (see top right quadrant of Figure 43). However, the opposite is true for less input intensive activities in Food products, Wood, and Textiles (the lower-right quadrant of the figure). Here MNEs expanded their value added while SMEs registered a net loss. This means that the impact of MNEs on SME activity might depend on the characteristics of the value chain and sector under analysis, with GVC intensive industries showing a higher complementarity between foreign and domestic economic activity.

Figure 43. Percentage changes in value-added output by sector, 2008 and 2012, Indonesia

Source: Own calculations using firm level data.

6.4. What are the aggregate vertical linkages between SMEs and MNEs?

Mapping GVC linkages between MNEs and small domestic firms is key to understanding how SMEs stand to gain from the economic activity of MNEs. This includes understanding the role MNEs play in the indirect exports of SMEs and the role they play as suppliers of inputs to the production of SME exports.⁵⁸ Box 9 describes the methodology employed to measure vertical GVC linkages with MNEs.

⁵⁸ A form of indirect importing.

SMEs accounted for around 25% of value-added exports of Indonesia and 35% in Thailand in 2012 (Figure 44). While in both countries most of this was exported directly by the SMEs themselves, MNEs and large domestic firms also represented important channels for SME exports. In Indonesia, SME indirect exports through foreign affiliates represented 8.6% of overall exports while large domestic firms represented 9.6%. By contrast, in Thailand, large domestic firms represented a more important conduit for SME exports at 25% compared to large foreign firms at 3.8%. The “Other” category, identifying SME exports to firms in the agricultural and services sectors also represented a strong channel for indirect exporting.

Box 9. Identifying SME-MNE vertical linkages

In order to capture vertical linkages between SMEs and MNEs, a further split to the augmented inter-country input-output (ICIO) table described in Box 3 is made. Departing from the ICIO that distinguishes small and large firms, firm-level data on foreign-ownership in Indonesia and Thailand is used further decomposing whether large firms are foreign or domestically owned. This is based on a definition of foreign-owned firms using a 50% foreign equity share threshold. The same split is not operated to the category of SMEs due to a more limited incidence of foreign-owned SMEs in the firm-level dataset, which renders the disaggregation methodologically difficult.

This split enables identifying SMEs' value-added exported directly and indirectly through other SMEs, as well as to disentangle indirect exports that take place through large domestic firms and large foreign firms (MNEs). It also enables decomposing inputs according to different types of firms, whether coming from other SMEs or sourced from large domestic firms or MNEs.

In terms of the role of MNEs as suppliers of inputs that are used by SMEs to produce exports, Figure 45 shows that most of the domestic value added in the exports of SMEs comes from the SME itself. The largest source of inputs is then ‘other’, identifying inputs from firms of different sizes and diverse ownership structures operating in agriculture and mainly services sectors. The data clearly shows that manufacturing MNEs represent a relatively small share of inputs in both Indonesia and Thailand. This suggests either that sourcing of SME inputs from MNEs in manufacturing is low, or that most of it takes place in services sectors.

Figure 44. SME exports by value added channel

Note: direct represents the value added exports of SMEs. Each other category is a channel for value added exports where 'other' refers to SME value added exports to firms in the agriculture and services sectors.

Source: Own calculations using firm-level data and TiVA.

Figure 45. SME domestic sourcing for exporting

Note: Categories identify origin of value added in the exports of SMEs. ‘Other’ refers to inputs from firms in the agriculture and services sectors.

Source: Own calculations using firm-level data and TiVA.

6.5. How do SME-MNE linkages vary across sectors?

The aggregate figures mask wide sectoral heterogeneity (as already anticipated in Section 2). SMEs’ role as exporters varies significantly across sectors (Figure 46a). For instance, in Indonesia, SMEs account for as much as 54 % and 43% of total value-added exports in sectors like Coke, refined petroleum and Chemicals, and as little as 1.7% of total value-added exports in Motor Vehicles. In Thailand, SMEs also account for a high share of exports in lower tech sectors, over 60% of exports of Wood products and around 55% of Chemicals, but they account for a somewhat higher, albeit still low, share of higher tech sectors such as Motor-vehicles (around

15%) – Figure 47a. Overall, across both countries a similar pattern emerges: SMEs tend to specialise in direct exports of low-technology goods.

SME-MNE linkages vary considerably across sectors (Figure 46.b and 47b). For example, in Indonesia's Machinery and equipment sector, MNEs channel about 50% of the value-added exports of SMEs. However, large domestic firms and MNEs play similar roles in Motor vehicles, transport equipment, textiles, wood and paper. In Thailand, SME-MNE linkages are highest also in higher tech industries but large domestic firms tend to be more important as conduits for SME value added exports. There are therefore mixed patterns in terms of the SME-MNE linkages, while these are clearly most pronounced in higher tech, traditional GVC sectors, large domestic firms also play a key role. Further and more formal analysis is needed to identify underlying trends.

One aspect that is not captured in this analysis is the quality or nature of the linkages that take place. The type of relationship between lead firms and SMEs – such as the mode of governance and the length of engagement – may have important implications for the benefits from trade and investment linkages. For example, (per paper for OECD-UNIDO (2019) on Samsung's mobile phone production in Viet Nam, see Tong and Seric, 2018), linkages with MNEs might have limited benefits where domestic firms serve as lower-tier suppliers of lower value-added products and services, rather than specialized providers of parts and components⁵⁹.

Moreover, the analysis above might not reflect the variety of relationships, ranging from ownership of affiliates to non-equity contractual relationships to arms' length arrangements, which might be established between foreign and domestic firms (OECD-UNIDO, 2019). While this section indeed focused on wholly-owned subsidiaries (>50% of the equity share), foreign investment in lower equity shares is also likely to influence arm's length trade and GVC linkages.⁶⁰

⁵⁹ Tong and Seric (2018), "Policies for strengthening linkages and spillovers in global value chains: Lessons from Samsung mobile phone production in Viet Nam", Background Paper for 'Inclusive Investment and GVCs: Opportunities for SMEs in ASEAN'.

⁶⁰ Arms' length relationships, for instance, may offer less stability (unless a regular relationship is established). Ownership arrangements, on the other hand, may provide SMEs with less autonomy (ITC 2017 SME competitiveness outlook), but may also facilitate deeper integration in GVCs. According to the WTO (2016), foreign-owned SMEs exhibit higher rates of both backward and forward participation. For instance, more than 40% of total sales were exported (directly or indirectly) for foreign-owned SMEs, as compared to only 10% for domestic SMEs.

Figure 46. Indonesia SME direct and indirect exports, 2012

a. Share in total value added exports

b. Share by channel

Note: Categories identify company through which SME value added exports are channelled.

Source: Own calculations using firm-level data and TiVA.

Figure 47. Thailand SME direct and indirect exports

a. Share in total value added exports

b. Share by channel

Note: Categories identify company through which SME value added exports are channelled.

Source: Own calculations using firm-level data and TiVA.

6.6. Conclusion

The analysis undertaken in this section explores how domestic SMEs stand to gain from the economic activity of multinational enterprises through GVC channels. To this end, the section maps the vertical GVC linkages between domestic SMEs and larger foreign and domestic firms. On aggregate, MNEs appear to represent a rather small share of total firms in Indonesia and Thailand – although in both countries their contribution to value-added is relatively important. However, it is domestic firms which have seen their share of total value-added increase the most, particularly large domestic firms in Indonesia and domestic SMEs in Thailand.

The analysis also highlights that there is very strong heterogeneity in linkages between SMEs and MNEs at the sectoral level. However, certain common patterns emerge. The direct exports of SMEs tend to concentrate in lower-tech sectors with much lower shares in higher tech sectors. Yet it is in these sectors that linkages with larger firms matter most, and, while MNEs play a key role, large domestic firms are also important conduits for SME activity.

Vertical linkages across sectors with different technological intensities are likely to have different potential impacts on SME productivity growth and competitiveness. GVC linkages with foreign firms in typical GVC sectors may have a greater potential for technology transfer and the catch-up of domestic firms, while this might be less important for linkages with MNEs and large domestic firms in lower-tech industries.

While this section provides a snapshot of the incidence, economic importance and sectorial distribution of vertical linkages between SMEs and larger firms, focusing on MNEs, further work would be needed to understand how the quality and nature of such linkages is conducive to benefits measured in productivity growth and increased performance of domestic SMEs.

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Annex A. Additional figures for Section 2

Figure A.1. SMEs' backward and forward participation rates by sector and country

Note: This figure presents indicators of GVC participation by SMEs across different sectors.

Source: Own calculations.

Figure A.2. SME relative direct versus indirect exports

Note: This figure shows the ratio between direct and indirect exports. For instance, a value of 200 says that SMEs in a country export twice as much indirectly than they do directly.

Source: Own calculations.

Annex B. Identifying SME participation in GVCs using firm-level data and TiVA

To identify SME participation in GVCs, and capture GVC participation indicators for SMEs, two sets of data are combined. The first is comprehensive firm-level data, which includes data on the value added, gross output, and import and export shares occupied by SMEs across aggregate sectors. The second is data on the sectoral inter-linkages within countries which can be readily obtained from the OECD-WTO TiVA inter-country-input-output (ICIO) table.⁶¹

Merging the firm-level data with the TiVA ICIO enables the creation of an augmented ICIO table which can be used to calculate GVC indicators identifying the origin of value added in exports by firm type. The method, laid out in Piacentini and Fortanier (2015) and Fortanier and Miao (2016 and 2018) involves (i) splitting the columns and rows of the TiVA ICIO table, (ii) separating out SMEs and large firms using weights obtained from detailed firm-level data, and (iii) capturing the share of value added, gross output, gross exports and imports.

Once the split of the ICIO is made, the computation of indicators capturing the contribution of SMEs to exports involves using familiar techniques for the calculation of GVC participation indicators decomposing gross exports into domestic and foreign value added components (see OECD, 2013 for a discussion of the method). It is thus possible to identify the origin of this value added in terms of firm type, enabling the calculation of direct and indirect contributions of SMEs to the production of gross exports.

The depth and coverage of the firm-level data, in terms of variables, representativeness and time span determines the precision of the estimated contribution of SMEs to exports. To date, access to firm-level data has been secured for Indonesia, Singapore, Thailand and Viet Nam:

- The Indonesian annual Manufacturing Survey, collected by the Indonesian Statistical Agency (BPS, Badan Pusat Statistik) contains information, in 2011, for 23 370 Indonesian establishments across a range of manufacturing sectors. One important shortcoming of this dataset is that the survey only identifies firms that have more than 20 employees implying that small and micro-sized firms are not represented.
- For Singapore the Ministry of Trade and Industry provided summary statistics on the share of value added, imports, exports and output of manufacturing SMEs across aggregate sectors of activities. This enabled us to split the OECD ICIO to obtain comparable results.
- Firm-level data for Thailand come from the 2012 Business and Industrial Census, conducted by the Thai National Statistical Office (NSO). It contains information on 97 967 manufacturing establishments with a good distribution of observations across firms of different size.

⁶¹ This is, verbatim, from Lopez-Gonzalez (2017).

- Firm-level data for Viet Nam come from the General Statistical Office (GSO). The data for 2011 identifies 339 232 establishments and includes establishments of different sizes and across agricultural, manufacturing and services sectors.

A further challenge is that these surveys often do not capture a representative sample of micro-enterprises which make the bulk of firms in ASEAN countries (according to Deloitte (2014) 99% of SMEs in Indonesia are micro-enterprises). Additionally, firms which are unregistered or informal – and likely to employ a large share of workers – tend not to be covered.

Annex C. Variables for Section 3

Table C.1. List of variables used in sector-level regressions

Variables	Description	Mean	SD	Min	Max
Firm output	Continuous variable	10794.37	14228.98	1.72	119402.9
Foreign demand	Continuous variable	1237881	2615550	9715.02	1.63E+07
Distance	Continuous variable	9274.61	4441.21	505.54	19475.95
Common language	Dummy variable	0.03	0.17	0	1
Contiguity	Dummy variable	0.02	0.15	0	1
Quality of customs in partner country	Continuous variable	4.54	0.81	2.10	6.47
Quality of domestic customs	Continuous variable	0.27	0.31	0.03	2.50
FDI inflows in partner country	Continuous variable	8.62	30.11	-58.32	451.72
FDI inflows	Continuous variable	4.57	4.79	0.67	17.84
Internet use	Continuous variable	21.44	16.35	0.30	71
FTA	Dummy variable	0.20	0.40	0	1
Time required to start a business	Continuous variable	51.64	38.10	2.50	164
Applied tariff in partner country	Continuous variable	6.19	8.46	0	177.65
Applied tariff at home	Continuous variable	7.60	6.84	0	86.84

Table C.2. List of variables used in firm-level regressions

Variables	Description	Mean	SD	Min	Max
Percentage of capital owned by foreign agents	Continuous variable	6.719005	23.75189	0	100
Total inputs	Continuous variable	3.22E+07	4.05E+08	0	8.10E+10
TFP (Olley-Pakes)	Continuous variable	44.5873	2581.95	2.52	926818.8
Capital-labour ratio	Continuous variable	163733.6	8246019	0	1.76E+09
Total workers	Continuous variable	175.63	690.59	20	41242
Physical infrastructure (World Economic Forum)	Continuous variable	3.30	0.52	2.60	4.00
Applied tariff at home	Continuous variable	2.02	0.62	0	5.04
NTM	Continuous variable	2.85	1.82	0.26	5.29
Time to export at home	Continuous variable	14.84	2.76	13.3	17.2
Quality of domestic customs	Continuous variable	3.65	0.37	3.01	4

Annex D. OECD-UNIDO Thai Enterprise Survey – supporting tables

300 Thai firms were surveyed across several criteria: sector, firm size, ownership, export status and location (Table D.1). Sector coverage included food products and beverages; textiles and garments; basic and fabricated metals; machinery (of any kind), motor vehicles and other transport equipment, as well as, business services (computer, R&D, engineering, legal, advertising, etc.).

Table D.1. Sample characteristics

Strata	Description	Number	%
Sector	Food products, beverages and tobacco (ISIC 15-16)	82	27%
	Textiles, textile products, leather and footwear (ISIC 17-19)	55	18%
	Basic and fabricated metals; machinery (ISIC 27-33)	75	25%
	Motor vehicles and other transport equipment (ISIC 34-35)	38	13%
	Business services (ISIC 72-74)	50	17%
Size	<100 employees	170	57%
	100-199 employees	24	8%
	200+ employees	88	29%
	Unreported	18	6%
Ownership	Domestic	253	84%
	Foreign	47	16%
Export	Yes	164	55%
	No	136	45%
Location	Bangkok	114	38%
	Outside Bangkok	186	62%
Total		300	

Source: OECD-UNIDO Thai Enterprise Survey.

Figure D.1. Relationship length and upgrading

Note: This figure presents the share of SMEs that report upgrading as a result of exporting. Data is split into the 50 SMEs that have a long-term relationship with their overseas buyers and the 34 SMEs that do not have a long-term relationship.

Source: OECD-UNIDO Thai Enterprise Survey.

Figure D.2. Variation in the type of buyer and employment benefits

Note: This figure presents the share of SMEs that report employment benefits as a result of selling to a given type of firm. Data is limited to responses from the 84 SMEs that have purchased inputs from (or sold outputs to) all three categories of firms.

Source: OECD-UNIDO Thai Enterprise Survey.

Figure D.3. Indirect exporting and employment benefits

Note: This figure presents the share of SMEs that report employment benefits as a result of selling locally. Data is split into the 56 SMEs that are selling inputs for eventual export and the 47 SMEs that are selling inputs for eventual domestic consumption.

Source: OECD-UNIDO Thai Enterprise Survey.

Figure D.4. Relationship length and employment benefits

Note: This figure presents the share of SMEs that report employment benefits as a result of exporting. Data is split into the 50 SMEs that have a long-term relationship with their overseas buyers and the 34 SMEs that do not have a long-term relationship.

Source: OECD-UNIDO Thai Enterprise Survey.

Figure D.5. Geographic location and GVC participation through imports and exports

Note: This figure presents the share of SMEs that export and import. Data is split by location.

Source: OECD-UNIDO Thai Enterprise Survey.

The questionnaire of the OECD-UNIDO Thai Enterprise survey is available upon request.

Annex E. Supporting tables for Section 4

Table E.1. Determinants of GVC participation through imports

Variables	SME	LARGE
Firm output	0.234** (0.0970)	-0.184 (0.222)
Foreign demand	0.412*** (0.0432)	0.430*** (0.0414)
Distance	-0.122*** (0.0175)	-0.114*** (0.0191)
Common language	0.0468** (0.0204)	0.0565** (0.0217)
Contiguity	0.218*** (0.0270)	0.206*** (0.0290)
Quality of domestic customs	0.350** (0.159)	0.180* (0.0940)
FDI inflows	0.0705 (0.270)	-0.685*** (0.247)
Internet use	0.0355** (0.0146)	0.0302* (0.0174)
FTA	0.00627 (0.0105)	0.00729 (0.0122)
Time required to start a business	0.992 (0.799)	-1.398** (0.612)
Applied tariff at home	-0.0149*** (0.00448)	-0.0162*** (0.00515)
Constant	-0.835** (0.390)	0.591 (0.548)
Observations	9,086	8,909
R-squared	0.937	0.952

Note: Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The figure shows significant standardised coefficients from a gravity regression. Reporter-product, partner and year fixed effects are used. Standard errors clustered at reporter-product level. The figure shows significant standardised coefficients from a gravity regression.
Source: Authors' calculations.

Table E.2. Determinants of GVC participation through exports

Variables	SME	LARGE
Firm output	0.280*** (0.0703)	0.346** (0.138)
Foreign demand	0.0876 (0.0665)	0.0654 (0.0663)
Distance	-0.183*** (0.0309)	-0.181*** (0.0351)
Common language	0.149** (0.0625)	0.192*** (0.0706)
Contiguity	0.229*** (0.0632)	0.233*** (0.0722)
Quality of domestic customs	0.110 (0.105)	0.0933*** (0.0343)
FDI inflows in partner country	0.205*** (0.0428)	0.217*** (0.0453)
FDI inflows	-0.200** (0.0856)	0.116*** (0.0342)
Internet use	0.0528** (0.0259)	0.0414 (0.0261)
FTA	0.0572** (0.0254)	0.0641** (0.0253)
Time required to start a business	-0.751 (0.594)	-1.044** (0.513)
Applied tariff in partner country	-0.0122 (0.00753)	-0.0133* (0.00791)
Constant	0.189 (0.562)	-0.183 (0.326)
Observations	5,466	5,435
R-squared	0.924	0.910

Note: Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The figure shows significant standardised coefficients from a gravity regression. Reporter-product, partner and year fixed effects are used. Standard errors clustered at reporter-product level.

Source: Authors' calculations.

Annex F. Supporting information for Section 5

Index of regulatory distance using MAST database

The essence of the approach for calculating the index is as follows. Consider a product, say HS 840731 in HS classification (“spark ignition reciprocating piston engines of a kind used for the propulsion of vehicles of Ch.87, of a cylinder capacity not >50cc”). Suppose that country *i* imposes an NTM coded in the MAST classification in Table F.1. as B840 (inspection requirements) on that product.

If country *j* imposes the same NTM on the same product, for that given NTM-product pair, the two countries are considered “similar” with no regulatory-distance and the similarity index is one. If, by contrast, one of the two countries imposes NTM B840 on product HS 840731 but the other does not, the regulatory distance is one and the similarity index is set to zero. This comparison is repeated for all NTMs in the NTM-trade database applied to product HS 840731 by either *i* or *j*, and all the resulting ones and zeroes are added up. The sum is then divided by the total number of NTMs applied to HS 840731 by any of the two countries.

This procedure yields a single number between zero and one (the proportion of NTMs applied to HS 840731 by both countries simultaneously), for each origin-destination-product, that indicates the regulatory distance between the two countries for that product (a value closer to one means that the countries are more similar in their regulatory patterns).

Table F.1. List of Non-Tariff measures in MAST

A	Sanitary and Phytosanitary	B	Technical Barriers to Trade
A1	Prohibitions/restrictions of imports for SPS reasons	B1	Prohibitions/restrictions of imports for objectives set out in the TBT agreement
A11	Temporary geographic prohibitions for SPS reasons	B11	Prohibition for TBT reasons
A12	Geographical restrictions on eligibility	B14	Authorization requirement for TBT reasons
A13	Systems approach	B15	Registration requirement for importers for TBT reasons
A14	Special authorization requirement for SPS reasons	B19	Prohibitions/restrictions of imports for objectives set out in the TBT agreement, n.e.s.
A15	Registration requirements for importers	B2	Tolerance limits for residues and restricted use of substances
A19	Prohibitions/restrictions of imports for SPS reasons, not elsewhere specified (n.e.s.)	B21	Tolerance limits for residues of or contamination by certain substances
A2	Tolerance limits for residues and restricted use of substances	B22	Restricted use of certain substances
A21	Tolerance limits for residues of or contamination by certain (non-microbiological) substances	B3	Labelling, Marking and Packaging requirements
A22	Restricted use of certain substances in foods and feeds and their contact materials	B31	Labelling requirements
A3	Labelling, Marking and Packaging requirements	B32	Marking requirements
A31	Labelling requirements	B33	Packaging requirements
A32	Marking requirements	B4	Production or Post-Production requirements
A33	Packaging requirements	B41	TBT regulations on production processes
A4	Hygienic requirements	B42	TBT regulations on transport and storage
A41	Microbiological criteria of the Final product	B49	Production or post-production requirements, n.e.s.
A42	Hygienic practices during production	B6	Product identity requirement
A49	Hygienic requirements, n.e.s.	B7	Product quality or performance requirement
A5	Treatment for elimination of plant and animal pests and disease-causing organisms in the final product (e.g. Post-harvest treatment)	B8	Conformity assessment related to TBT
A51	Cold/heat treatment	B81	Product registration requirement
A52	Irradiation	B82	Testing requirement
A53	Fumigation	B83	Certification requirement
A59	Treatment for elimination of plant and animal pests and disease-causing organisms in the final product, n.e.s.	B84	Inspection requirement
A6	Other requirements on production or post-production processes	B85	Traceability information requirements
A61	Plant-growth processes	B851	Origin of materials and parts
A62	Animal-raising or -catching processes	B852	Processing history
A63	Food and feed processing	B853	Distribution and location of products after delivery
A64	Storage and transport conditions	B859	Traceability requirements, n.e.s.
A69	Other requirements on production or post-production processes, n.e.s.	B89	Conformity assessment related to TBT, n.e.s.
A8	Conformity assessment related to SPS	B9	TBT Measures n.e.s.
A81	Product registration requirement		

A82	Testing requirement	C	Border Control measures
A83	Certification requirement	C1	Pre-shipment inspection
A84	Inspection requirement	C2	Direct consignment requirement
A85	Traceability requirements	C3	Requirement to pass through specified port of customs
A851	Origin of materials and parts	C4	Import monitoring and surveillance requirements and other automatic licensing measures
A852	Processing history	C9	Other formalities, n.e.s.
A853	Distribution and location of products after delivery	E3	Prohibitions other than for SPS and TBT reasons
A859	Traceability requirements, n.e.s.	E31	Prohibition for economic reasons
A86	Quarantine requirement	E311	Full prohibition (import ban)
A89	Conformity assessment related to SPS, n.e.s.	E312	Seasonal prohibition
A9	SPS measures n.e.s.	E313	Temporary prohibition, including suspension of issuance of licences
E	Quantity control measures	E314	Prohibition of importation in bulk
E1	Non-automatic import licensing procedures other than authorizations for SPS or TBT reasons	E315	Prohibition of products infringing patents or other intellectual property rights
E11	Licensing for economic reasons	E316	Prohibition of used, repaired or remanufactured goods
E111	Licensing procedure with no specific ex ante criteria	E319	Prohibition for economic reasons, n.e.s.
E112	Licensing for specified use	E32	Prohibition for non-economic reasons
E113	Licensing linked with local production	E321	Prohibition for religious, moral or cultural reasons
E119	Licensing for economic reasons, n.e.s.	E322	Prohibition for political reasons (embargo)
E12	Licensing for non-economic reasons	E329	Prohibition for non-economic reasons, n.e.s.
E2	Quotas	E5	Export restraint arrangement
E21	Permanent	E51	Voluntary export-restraint arrangements (VERs)
E211	Global allocation	E511	Quota agreement
E212	Country allocation	E512	Consultation agreement
E22	Seasonal quotas	E513	Administrative cooperation agreement
E221	Global allocation	E6	Tariff Rate Quotas
E222	Country allocation	E61	WTO-bound TRQs, included in WTO schedules (concessions and commitments under WTO negotiations)
E23	Temporary	E62	Other TRQs included in other trade agreements.
E231	Global allocation	E621	Global allocation
E232	Country allocation	E622	Country allocation
		E9	Quantity control measures n.e.s.

Source: UNCTAD (2012).

Index for heterogeneity in product-specific rules of origin (PSR)

In order to investigate the heterogeneity effect of RoO Angeli et al (2019) set-up a new index capturing the divergence of RoO for a country across its different trade agreements. A Shannon-type index used for this indicates the number of different RoO which can apply to a product (HS6 digit level) in a country because of multiple RTAs with different PSR.

Calculated as follows:

$$H = \sum_{i=1}^S - (P_i * \ln P_i)$$

where: H = the Shannon diversity index P_i = fraction of the entire population made up of PSR i , S = numbers of existing PSR in the classification and $\sum$ = sum from PSR type 1 to PSR type S

Because of the way the index is constructed, the restrictiveness of PSR in a country is considered to be at its highest when its agreements invoke more than one method for determining origin. Membership of multiple agreements which use dissimilar rules is considered to be more restrictive, while membership of only a single agreement is considered the least restrictive according to this criterion. For example, with a Shannon index of 1.50, this number can be converted into $\exp(1.50) = 4.5$, this means an equivalent heterogeneity as a country with 4.5 different types of PSR on average by products.

Table F.2. Index for Product specific rules of origins

PSR rule	Index of restrictiveness
CC	8
CC and VC/TR	14 (15 if VC>40%)
CC or VC/TR	5(6 if VC>40%)
CC with EXC	14
CH	6
CH and VC/TR	12(13 if VC>40%)
CH or VC/TR	3(4 if VC>40%)
CH with EXC	12
CS	4
CS and VC/TR	10(11 if VC>40%)
CS or VC/TR	1(2 if VC>40%)
CS with EXC	10
TR	8
TR and VC	14(15 if VC>40%)
TR or VC	4(5 if VC>40%)
VC	6(8 if VC>40%)
WO	15

Note: CC is change in chapter/ CH is change in heading/ CS is change in subheading/ VC is value content/TR is technical requirement/ WO is wholly obtained/ EXC is Exception.

Source: Authors calculation

Table F.3. *Ad valorem* equivalent of NTMs and determinants of direct exporting and direct importing for SMEs

Dependant variable:	Export (binary)	Import (binary)
Age of firm	0.0197 (0.0275)	0.0528* (0.0283)
Number of employees	9.293*** (0.712)	6.033*** (1.111)
Squared Number of employees	-273.3*** (20.48)	-193.1*** (22.88)
International certification (ISO)	0.0134 (0.0172)	0.00986 (0.0125)
Share of foreign intermediates	0.186*** (0.0698)	
Line of credit	0.0153 (0.0129)	-0.000955 (0.0105)
Share of foreign ownership	0.296*** (0.0383)	0.265*** (0.0286)
Years of experience of manager	-0.0106 (0.0133)	
Purchases of fixed assets	-0.00812 (0.0106)	0.0367** (0.0177)
FTA	0.630** (0.299)	-0.497** (0.218)
AVE for SPS measures	-0.0472*** (0.0143)	0.118 (0.1052)
AVE for TBT measures	-0.00149 (0.0463)	-0.0447*** (0.0142)
AVE for QRs measures	-0.161*** (0.0294)	-0.0364* (0.0209)
Constant	-2.378*** (0.180)	-1.577*** (0.209)
Time, country and sector dummies	Y	Y
Observations	5,732	5,841

Note: Robust standard errors in parentheses clustered by reporter-sector, *** p<0.01, ** p<0.05, * p<0.1.

Source: Own calculations using data from the World Bank Enterprise Survey.

Table F.4. Effect of Specific Trade Concerns (STC) for technical NTMs on GVC participation through imports (backward) and through export (forward)

Variables	GVC backward		GVC forward	
	SME	LARGE	SME	LARGE
Firm output	0.254*** (0.0259)	0.278*** (0.0195)	0.274*** (0.0158)	0.315*** (0.0219)
Foreign demand	0.591*** (0.00968)	0.608*** (0.00861)	0.608*** (0.0117)	0.613*** (0.0115)
Distance	-0.122*** (0.0419)	-0.111*** (0.0398)	-0.220*** (0.0467)	-0.220*** (0.0449)
Common language	0.110 (0.0760)	0.107 (0.0775)	0.172** (0.0791)	0.204** (0.0832)
Contiguity	0.283*** (0.0620)	0.269*** (0.0626)	0.300*** (0.112)	0.312*** (0.115)
Quality of customs in partner country	0.109*** (0.0279)	0.0877** (0.0365)	0.0152 (0.0314)	-0.0235 (0.0307)
Quality of domestic customs	0.0617*** (0.0107)	0.0874*** (0.0143)	0.0596*** (0.0113)	0.0866*** (0.0152)
FDI inflows	-0.180*** (0.0462)	-0.276*** (0.0667)	-0.104* (0.0604)	-0.611*** (0.0589)
FDI outflows	0.0621** (0.0269)	-0.248*** (0.0270)	-0.0144 (0.0272)	-0.0891*** (0.0279)
Internet use	-0.00661 (0.0333)	-0.00800 (0.0323)	0.0494 (0.0395)	0.0580 (0.0411)
FTA	-0.00559 (0.0900)	0.00616 (0.130)	-0.142** (0.0589)	-0.120** (0.0521)
Time required to start a business	-0.481*** (0.0925)	-0.832*** (0.119)	-0.178** (0.0886)	-0.378*** (0.0918)
Applied tariff in partner country	-0.00926 (0.00855)	-0.00715 (0.00708)	-0.00529 (0.0100)	-0.00769 (0.00963)
Applied tariff at home	-0.0230*** (0.00629)	-0.0315*** (0.00656)	0.00545 (0.00826)	0.000304 (0.00760)
STC in partner country	-0.00138 (0.0115)	-0.00595 (0.0119)	-0.0389*** (0.0129)	-0.0347*** (0.0133)
STC at home	0.0391*** (0.00867)	-0.0523*** (0.0100)	0.0475*** (0.0104)	-0.0226** (0.0106)
Constant	-0.723*** (0.0798)	-0.00276 (0.0824)	0.204*** (0.0634)	0.918*** (0.0757)
Time, country and sector dummies	Y	Y	Y	Y
Observations	4,605	4,515	4,605	4,576
R-squared	0.897	0.906	0.917	0.904

Note: The figure shows significant standardised coefficients from a gravity regression.

Source: Authors' calculations.

Table F.5. Impact of Regulatory distance on GVC participation through imports (backward) and through export (forward)

Variables	GVC backward		GVC forward	
	SME	LARGE	SME	LARGE
Firm output	0.268*** (0.0233)	0.277*** (0.0195)	0.290*** (0.0158)	0.314*** (0.0219)
Foreign demand	0.591*** (0.00976)	0.643*** (0.0383)	0.605*** (0.0115)	0.610*** (0.0114)
Distance	-0.128*** (0.0420)	-0.110*** (0.0403)	-0.215*** (0.0461)	-0.217*** (0.0447)
Common language	0.110 (0.0789)	0.108 (0.0772)	0.172** (0.0778)	0.205** (0.0820)
Contiguity	0.276*** (0.0645)	0.270*** (0.0628)	0.304*** (0.111)	0.315*** (0.115)
Quality of customs in partner country	0.139*** (0.0311)	0.0621 (0.0535)	0.00150 (0.0304)	-0.0376 (0.0306)
Quality of domestic customs	0.0715*** (0.0111)	0.0702*** (0.0138)	0.0683*** (0.0119)	0.0790*** (0.0150)
FDI inflows	-0.172*** (0.0466)	-0.232*** (0.0866)	-0.0898 (0.0590)	-0.626*** (0.0590)
FDI outflows	0.0819*** (0.0285)	-0.242*** (0.0360)	-0.0358 (0.0274)	-0.0942*** (0.0280)
Internet use	-0.0218 (0.0342)	-0.00433 (0.0332)	0.0551 (0.0395)	0.0625 (0.0411)
FTA	-0.00496 (0.0909)	0.00152 (0.130)	-0.143** (0.0564)	-0.127** (0.0531)
Time required to start a business	-0.411*** (0.0964)	-0.901*** (0.151)	-0.187** (0.0885)	-0.422*** (0.0925)
Applied tariff in partner country	-0.00915 (0.00741)	-0.00824 (0.00798)	-0.0132 (0.0112)	-0.0148 (0.0112)
Applied tariff at home	-0.0327*** (0.00688)	-0.0229*** (0.00655)	-0.00201 (0.00868)	0.00432 (0.00784)
Regulatory distance on technical NTMs	-0.0468*** (0.0130)	-0.0120 (0.0125)	-0.0203 (0.0125)	-0.0176 (0.0127)
Constant	-0.821*** (0.0806)	-0.00441 (0.0751)	0.167*** (0.0633)	0.945*** (0.0769)
Time, country and sector dummies	Y	Y	Y	Y
Observations	4,605	4,515	4,605	4,576
R-squared	0.897	0.906	0.917	0.904

Note: The figure shows significant standardised coefficients from a gravity regression.

Source: Authors' calculations.

Figure F.1. Detailed regime wide rules of origins

Note: Average over 35 ASEAN PTAs, 38 East Asia PTAs and 179 Other PTAs.

Source: Authors calculations.

Table F.6. Index for regime-wide provisions

Provisions types	Categories	Corresponding Index of restrictiveness
Certification body	Self/ Administration/ Both	0 / 1 / 1
Validity period	Less 1 year/ 1 year/ more than 1 year	1 / 0.5 / 0
Record keeping period	Less 4 years/ 4 years/ more than 4 years	0 / 0.5 / 1
Exemption	No / <1000 \$US / >1000\$US	1 / 0 / 0.5
Minor errors	Yes/No	0 / 1
Verification	Indirect/Direct	0 / 1
Cumulation type	No/ bilateral/ diagonal/ Full/ Cross	1 / 0.8 / 0.5 / 0.5 / 0
De minimis	No / 7% / >10%	1 / 0.5 / 0
Absorption rule	No/Yes	1 / 0
Duty drawbacks	Not mentioned /Prohibited/ Allowed	0.5 / 1 / 0
Fungible Goods	No/Yes	1 / 0
Advance ruling	No/Yes	1 / 0

Source: Authors calculation

Table F.7. Restrictiveness of RoO as determinant of direct exporting and direct importing for SMEs

Dependant variable	Export (binary)	Import (binary)
Age of firm	0.0165 (0.0263)	0.0369 (0.0255)
Number of employees	8.869*** (0.660)	4.444*** (0.915)
Squared Number of employees	-260.7*** (18.30)	-142.0*** (22.28)
International certification (ISO)	0.0167 (0.0182)	0.00258 (0.0118)
Share of foreign intermediates	0.187*** (0.0665)	
Line of credit	0.0138 (0.0135)	0.00606 (0.0107)
Share of foreign ownership	0.287*** (0.0358)	0.247*** (0.0311)
Years of experience of manager	-0.0133 (0.0109)	
Purchases of fixed assets	-0.0142 (0.0102)	0.0213 (0.0156)
FTA	0.630** (0.299)	0.467*** (0.110)
FTA*PSR restrictiveness	-0.4511 (0.2884)	-0.0583 (0.1379)
FTA*RW restrictiveness	-0.1948** (0.1051)	-0.233*** (0.0820)
FTA*RoO Heterogeneity	-0.589*** (0.0294)	0.0304 (0.3102)
Constant	-2.128*** (0.146)	-1.442*** (0.194)
Time, country and sector dummies	Y	Y
Observations	5.872	5.930

Note: Robust standard errors in parentheses clustered by reporter-sector,
 *** p<0.01, ** p<0.05, * p<0.1.

Source: Own calculations using data from the World Bank Enterprise Survey.

Table F.8. Effect of Rule of origins on GVC participation through imports (backward) and through export (forward)

Variables	GVC backward		GVC forward		Exports	
	SME	LARGE	SME	LARGE	SME	LARGE
Firm output	0.268*** (0.0240)	0.278*** (0.0194)	0.289*** (0.0157)	0.314*** (0.0218)	0.221*** (0.0255)	0.224*** (0.0272)
Foreign demand	0.560*** (0.0312)	0.569*** (0.0343)	0.635*** (0.0383)	0.632*** (0.0370)	0.565*** (0.178)	0.578*** (0.185)
Distance	-0.121*** (0.0405)	-0.111*** (0.0394)	-0.216*** (0.0461)	-0.216*** (0.0450)	-0.221*** (0.0488)	-0.223*** (0.0483)
Common language	0.119 (0.0782)	0.114 (0.0810)	0.174** (0.0796)	0.210** (0.0838)	0.0496 (0.0924)	0.0763 (0.0946)
Contiguity	0.282*** (0.0614)	0.269*** (0.0639)	0.303*** (0.112)	0.315*** (0.117)	0.356** (0.140)	0.355** (0.140)
Quality of customs in partner country	0.104*** (0.0391)	0.0976* (0.0539)	-0.0458 (0.0476)	-0.0497 (0.0446)	-0.0364 (0.0259)	-0.0327 (0.0246)
Quality of domestic customs	0.0696*** (0.0112)	0.0704*** (0.0138)	0.0694*** (0.0118)	0.0797*** (0.0151)	0.0812*** (0.0135)	0.0823*** (0.0172)
FDI inflows	-0.333*** (0.0888)	-0.329*** (0.0876)	-0.539*** (0.102)	-0.552*** (0.100)	0.261*** (0.0807)	0.246*** (0.0736)
FDI outflows	0.0372 (0.0316)	-0.219*** (0.0330)	-0.129*** (0.0298)	-0.0870*** (0.0316)	-0.282*** (0.0795)	-0.639*** (0.0828)
Internet use	-0.00841 (0.0340)	-0.00920 (0.0333)	0.0484 (0.0399)	0.0567 (0.0421)	0.0241 (0.0429)	0.0394 (0.0442)
FTA	0.0772 (0.130)	0.0387 (0.147)	-0.121** (0.0524)	-0.0847 (0.0721)	-0.0343 (0.0551)	-0.000941 (0.0386)
Time required to start a business	-0.558*** (0.130)	-0.806*** (0.149)	-0.684*** (0.122)	-0.416*** (0.116)	0.00288 (0.0250)	0.00400 (0.0245)
Applied tariff in partner country	-0.00959 (0.00799)	-0.00832 (0.00792)	-0.0134 (0.0110)	-0.0151 (0.0109)	-1.038*** (0.234)	-1.551*** (0.229)
Applied tariff at home	-0.0296*** (0.00655)	-0.0238*** (0.00643)	-0.00365 (0.00865)	0.00261 (0.00772)	0.00846 (0.0129)	0.00805 (0.0122)
RW restrictiveness	-0.0441 (0.0352)	-0.0185 (0.0429)	-0.0093 (0.0270)	-0.0175 (0.0246)	-0.0831 (0.1023)	-0.0547 (0.0978)
PSR restrictiveness	0.00790 (0.0193)	-0.00165 (0.0131)	-0.0253* (0.0106)	-0.0322* (0.0130)	-0.0366* (0.0183)	-0.0398** (0.0190)
Constant	-0.679*** (0.0827)	0.0667 (0.0780)	0.343*** (0.0647)	0.896*** (0.0770)	-0.343** (0.149)	0.198 (0.146)
Time, country and sector dummies	Y	Y	Y	Y	Y	Y
Observations	4,605	4,515	4,605	4,576	4,555	4,465
R-squared	0.896	0.904	0.916	0.904	0.756	0.758

Note: The figure shows significant standardised coefficients from a gravity regression.

Source: Authors' calculations.