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Advancing Free Trade
for Asia-Pacific **Prosperity**

Services in Global Value Chains: Manufacturing-Related Services

APEC Policy Support Unit
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Chapter 1

Manufacturing-Related Services

Summary Report

Patrick Low¹ and Gloria O. Pasadilla²

1.1. Introduction

This report contains an analysis of the role of services in manufacturing value chain activities as well as policy issues that affect the supply of these services. It responds to a request by the APEC Committee on Trade and Investment to look at the increasing importance of services in global trade. The approach to analyzing services under this project was to undertake case studies of the value chains of firms in order to understand how services entered production, trade and consumption, and what functions they performed. The primary reason for this analysis was to identify the policy frameworks and specific policies in various economies within the region that affected both the establishment and operation of manufacturing-related services. The project has compiled 22 case studies from different APEC economies, 14 from Asia and 8 from North America and Chile. Nine out of 22 are big multinational firms or their subsidiaries, ten can be considered medium-to-large firms either with growing international operations or as strategic suppliers to multinational firms, and one an SME in the technology industry.

The report is organized in three main sections. The next section will discuss the evolving role of services in the global economy. The following one will present the case studies and draw out some of the ways services are important both in terms of the value they add and also as a vehicle for new opportunities to deepen participation in value chains at the economy level. The final main section will present an analysis of how policies have affected the configuration, operation and location of value chains, with particular reference to the contribution of services.

1.2. The Evolving Role of Services in the Global Economy

Services in a historical context

The role of services has been evolving, driven in particular by technology, globalization and new business models. Services now make up a dominant share of income in most economies. The global share of GDP accounted for by services was 70 per cent in 2012. Unsurprisingly, the prominence of services as a source of income translates into jobs. In OECD members, total civilian employment in services in 2011 amounted to 73 per cent of all jobs (OECD 2014). Shares in developing and emerging economies are lower than in industrial economies for the most part, but rising. In APEC, the average share of employment in services in 2010 is 60 per cent. Notwithstanding variations in the shares of GDP attributable to services, manufacturing, agriculture, and mining, in the majority of economies the services share is often greater than that of the other three components of economic activity combined.

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Considering what the statistics tell us about the importance of services, it may seem odd that they have not received greater analytical attention, nor in many cases policy attention. One reason for this is the long shadow cast by classical economic thought. Adam Smith famously wrote in *The Wealth of Nations* that

“[T]he labor of a menial servant...adds to the value of nothing...services generally perish in the very instant of their performance, and seldom leave any trace or value behind” (Smith 1776).

The reason services were relegated zero value status turned essentially on their non-storability. Value was equated to the accumulation of capital, which required the production of something physical and storable. This thinking persisted in Ricardian and Marxian thought, and arguably also influenced neo-classical economic analysis. It is true, of course, that services played a less important role in seventeenth and eighteenth century economies, and their non-storability would have been a dominant feature.

In the 1960s, a new concern was raised about services, further relegating them to “poor cousin” status in scholarly (Baumol 1967; Fuchs 1968) and policy circles. The essential issue was that if services assumed a growing share of production, they would threaten the overall health of an economy. Costs would rise and be unmatched by productivity gains. Services were intrinsically hampered by their incapacity to generate efficiency gains. In other words, they were considered poor generators of productivity growth. Despite rising prices, some services might continue to be supplied because they were considered socially necessary (particularly in the case of social and other services supplied by governments). Wages would match productivity in other sectors, and pull up wages in the services industries. This was known as the Baumol Cost Disease.

Recent work has largely dispelled this pessimism. Technology, the internationalization of production, and evolving business models have all contributed to making a significant range of modern-day services an important source of productivity growth. As services have become a more prominent source of value in modern economies, their contribution to innovation has grown significantly. The innovation may be of a process variety, or it may involve new technology and be bundled with goods.

Several factors account for growing shares of services in global economic activity (Francois and Hoekman 2010). As incomes have risen, the composition of consumption has shifted in the direction of services. On the supply side, the increased internationalization of production has intensified reliance on services. When products can be sourced, made, and sold anywhere in the world, services become especially critical. For example, design, R&D and prototyping services help decrease the cost of production failure and shorten product development cycle. For sourcing of intermediate inputs, logistics and transportation services as well as supply chain management services make the geographic dispersion of GVC operations possible (Pasadilla and Wirjo, 2014). Similar structural and compositional shifts have taken place in consumption, both in terms of its internationalization and changed consumer preferences enabled by technological advances in information and communications technology, including the Internet.

Contrasts between services and goods

Some of the neglect of services has arisen from their intangibility, making them analytically and statistically elusive. Systematic efforts to deepen our understanding of the economic role played by services – particularly at the international level – have only started relatively recently. These efforts have intensified with the increased presence of global value chains (GVCs), where services fulfil a vital and complex role.

Services are typically differentiated from goods in four ways. The first, which troubled the classical economists, is a lack of storability. This means that production and consumption must be

simultaneous, the typically cited example of which is a haircut. The second has been the impossibility of transporting them or providing them at a distance, thus requiring that the producer and consumer be in the same place. The haircut comes to mind again. The third is that many services are customized and not commoditized. This variation in the characteristics of units of output makes it difficult to establish reliable value estimates and sometimes product prices, and to settle on an agreed nomenclature for service products. Finally, services are intangible, which makes them hard to see and measure.

The first two of the above characteristics – limits to storability and transportability – have been rendered far less important than they used to be by technological advances in information and communications technology. The third – customization – is a characteristic that may also apply to some categories of goods, although product differentiation in the goods domain may well be the consequences of the addition of services components into production. Only the final element – intangibility – is unchangeable over time and truly distinguishes goods from services.

The linkages between goods and services in the global value chain world, particularly through the bundling of offerings by firms of both goods and services, does raise a question about the wisdom of trying too hard to separate services and goods analytically. The argument for some sort of fusion is even stronger when it comes to the fallout from handling goods and services separately in many international regimes (Low, 2015).

In contrast to goods, services are multi-functional. They are not merely a source of value like any other product. They supply inputs to virtually every economic activity. Producer services such as transport, telecommunications, financial services, distribution, business and professional services, are essential to the entire operation of an economy. Services are also the “glue” that enables economic linkages and networks to operate both locally and internationally. Without them, there would be a lot less market integration and a lot more market segmentation.

A growing body of work emphasizes how much more we need to understand about the role of services in GVCs. Studies by Sweden’s Kommerskollegium (2010a, 2010b, 2012), for example, have introduced the notion of “servicification,” a process whereby manufacturing activities have become increasingly service-dependent. Other contributions in a similar vein refer to “servicification” and “service science” (Low 2013). The OECD has also contributed to a deeper understanding of how knowledge-based capital is an increasingly important invisible asset that contributes to growth (OECD, 2011 and 2012).

Understanding the role of services in trade

Traditionally, trade has been measured in gross terms. This contrasts sharply with the way we have always measured domestic production, which is in value-added terms. In other words, GDP is measured – either by returns to factors of production (capital and labour), or by expenditures – through the attribution of value to its source at each stage of the production process. By measuring trade in gross terms, however, the sources of value are unspecified (Ahamed, 2013).

Perhaps the simplest way of seeing this is to think of an economy’s exports. Exports reported in gross terms include foreign sources of value contained in the imports. These are incorrectly counted as value coming from the exporting economy. It amounts to a kind of double counting and overstates the domestic content of exports. Were the import content to be netted out, exports would reflect domestic value added just as GDP estimates do.

The implications for understanding the nature of trade relationships among economies are far-reaching. At least four perceptions can change radically. First, the true nature of bilateral trade balances is obscured. It transpires, for example, that China’s much-vaunted current account surplus with the United States was significantly over-stated. In 2010, for example, China’s trade surplus was

estimated at US\$176 billion in gross terms but was reduced to US\$131 billion in value-added terms – an overstatement of 34 per cent in the bilateral balance (Koopman et al., 2013). Some of that difference was attributable to understated (value-added) bilateral trade deficits of Japan and Korea with the United States.

Secondly, if trade flows are recorded in gross terms, it is not difficult to see how the technology content of an economy's exports could be misspecified. Dedrick et al. (2010) provide a good illustration of this phenomenon with the feted example of the iPhone putatively made in China. The factory gate price of an iPhone in China was recorded as US\$144. But less than 10 per cent of this was Chinese value-added and most of that was attributable to assembly. Taken at face value, however, statistics would suggest that China was an exporter of high-tech smartphones to the United States. In this particular case, the United States was actually re-importing value it had added to the smartphone in the upstream design and engineering segments of the value chain.

Third, in addition to misspecifying the source of technology, gross trade flows also fail to tell us where jobs, and what kinds of jobs, are associated with trade. A final consideration, which follows from the other three, as to why gross trade flows mislead us is that by failing to identify the locus of trade-related economic activity, the data do not identify the true nature on mutual dependency relationships among economies.

The most important insight to emerge from the estimates of trade in value-added rather than gross terms is the extent to which services enter trade and generate value. When the services share of trade was being calculated on the basis of balance-of-payments statistics, that share was being regularly reported at less than 25 per cent of world trade. When trade was calculated in value-added terms off an internationally aggregated input-output table, the share of services jumped to 45 per cent (OECD, WTO 2013). That is a significant difference, and for various technical reasons may still be an underestimate. The availability of these new data, thanks to the efforts of international agencies, universities and some government agencies, has raised awareness of an important missing part of our understanding of the role of services in the global economy.

We can no longer think of services as important at home but relatively inconsequential in international trade. Moreover, when it becomes clear that services constitute a greater share of value in trade, it is also apparent that services do more than just enable distance to be bridged. They are an independent source of value in other ways as well. As noted earlier, awareness has grown in recent years of the contribution services make to innovation. In these circumstances, it comes as little surprise that interest is mounting in the ways policy affect services, both in terms of movement of capital (foreign direct investment), movement of people (work permits and visas for foreign employees), and of services flows in international product markets, regardless of whether these flows are incorporated or bundled in other services or goods, or whether they are supplied in discrete form.

The role of services in development

The developmental implications of the emergence of GVCs have reinvigorated the debate about the role of government in economies as they seek to diversify away from agriculture and extractive industries through industrialization. A lacuna in this discussion is the paucity of debate about where services fit. Given the predominance of services in economic activity and the nature and range of service activities, they offer valuable opportunities for diversification and development in emerging economies.

The importance of the omission is highlighted by the fact that small and medium-sized enterprises (SMEs) in developing and emerging economies account for anything between about one half (Stein et al. 2010) to two-thirds or more (Berrios and Pilgrim 2013) of jobs, and a large share of these SMEs appear to be service providers. Normah Mohd (2007) estimates that 90 per cent of Malaysian SMEs are service providers. In Hong Kong the number is 94 per cent (HKSAR 2014).

1.3. A Case Study Approach to Understanding Manufacturing-Related Services

Detailed data on services in economies and international trade is scarce. This is particularly challenging for services because of their intangibility and the resulting difficulties in identifying and measuring the value of services transactions. The case studies have enabled us to dig down to a fine level of detail in order to understand how services and manufacturing interact to produce manufactured output. Global value chains that focus on producing services are no less important, and they use goods and services as well in production and trade, but this is not the focus of the present study.

While the great advantage of case studies is their attention to detail, they do not lend themselves readily to generalizations or confident extrapolations for explaining the world. This is simply because we are generally looking at a single value chain among many operated by single firms and we are only looking at a small number of firms. The attainment of a statistically significant sample using a detailed case study methodology would simply not be possible within a reasonable time frame and budget. Rather, the case studies give us insights that point a light – not always under the proverbial street lamp – where it may be worthwhile to delve further. Firm surveys, or the use of more aggregated secondary data sources are alternative approaches, but they are complementary and less granulated³.

In the project we worked with 22 cases studies from companies around the APEC region. As mentioned, nine are large multinational companies or their subsidiaries, ten are medium-to-large companies with a growing international business, and one SME that is purely domestic but is a supplier to GVCs. Eight of the firms are from North America and Chile, while 14 are located in Asia. These companies have been generous with their time and their insights, enabling us to put together a set of case studies, all of which reveal interesting and different facets of realities on the ground. Table 1.1 lists the economies and products involved in the case studies.

Table 1.1. Sectors and products included in the case studies

<i>Sector</i>	<i>Economy where firm is located</i>
Aircraft control systems	Philippines
Automotive components	Japan
Brake hose end fittings	Mexico
Car antenna	Mexico
Car assembly	Philippines
Chassis parts	Mexico
Computer servers	Chinese Taipei
Construction machinery	United States
Consumer electronic appliances	Indonesia

³ The WTO-OECD work on a Trade in Value Added database has enhanced knowledge about the role of services in manufacturing. However, the TiVA data cannot give further information on more disaggregated service sectors such as business services and its subsectors. Even if complemented by other economic tables like the input-output tables available in the OECD STAN database which are more disaggregated than the TiVA since industries there are divided into 37 sectors instead of the 18 sectors in TiVA, the picture we get remains aggregated. For example, we know that ‘other business activities’ are important for business services, but there is no further information on how ‘other business activities’ are divided into the contribution of the different professional services and other components of this subclassification (Pasadilla and Wirjo, 2015a).

Industrial welding	Thailand
Mining and construction equipment	Japan
Oil and gas equipment	Singapore
Power generation equipment	Japan
Precision die and machine parts	Thailand
Printed circuit boards	Canada
Refrigerators	Japan
Telecommunications equipment	China
Wastewater treatment	Thailand
Watch	Hong Kong, China
Wine	Chile
<i>Fresh cherry</i>	<i>Chile</i>
<i>Integrated logistics</i>	<i>Mexico</i>

Even though the sample size is small, it covers capital goods, consumption goods, intermediates and natural resource extraction in 12 economies. Two companies that are not strictly manufacturing companies – one is pure agro product, another pure service – have been included to provide some contrast (as well as similarities) with manufacturing firms. Before entering into detailed findings from the case studies, the methodological approach is presented.

The methodological approach to the case studies

1. Defining the parameters of the value chain in the case study

The first task is to identify the particular value chains that will be followed. In many instances this entails choosing from among alternative operations within the firm offering the case study. Once the particular product and production sequence has been identified, a decision is required on where the chain should be deemed to begin and end. This is essential because of the networked nature of all production activity within an economy. For ease of analysis it is more straightforward to keep the parameters of the analysis within a single ownership structure – in other words, to work with a single lead firm. Where a switch of ownership in a value chain occurs, changing the identity of the lead firm, it becomes far more complicated to map the value chain with continuity.

The second cut-off point defining the value chain to be analyzed relates to how the arms-length purchase of inputs is to be managed. For analytical ease, only first-tier outsourced inputs into the lead firm's value chain are included. The reason for this is that each seller at the level of the first tier outsourced supplier is at the final downstream point of another value chain. It is the production of another lead firm. It would, of course, be possible to trace the production of the outsourced supplier back down the value chain to build a more comprehensive picture of the networked environment in which our initial lead firm is operating. Such an exercise would yield rich insights into the interdependency intrinsic to networks, and possibly the role of SMEs in value chains. But the work would be very time-consuming. Moreover, eventually it would be necessary to establish analytical cut-off points.

Supply chain managers seeking to assess the robustness of the value chains and potential sources of risk are most likely to trace multiple tiers of outsourced suppliers in order to identify potential weak points in their chains. As part of their risk management strategies, they will often envision potential alternative arrangements in case an unforeseen disruption occurs. Other managers prefer to diversify sources of supply at the outset as a risk mitigation strategy, but this depends on the scale of the lead firm's operation and will also incur additional transaction costs.

For our purposes, however, we simply cut off our definition of the value chain to be analyzed at the level of first-tier outsourced suppliers. This approach clearly reduces the completeness of our understanding of all the inputs into the value chain, but as noted above, there will always be somewhere in our networked world where a cut-off decision is required for analytical purposes. The alternative would be the impossible task of tracing the web of every production process back to its primal inputs of labour and capital.

The implication of truncating the domain within which the analysis occurs is important from the perspective of comparing different case studies in the set of 22. They simply become less comparable on account of ownership structures defining the start and finish of the value chain, and on account of the relative frequency of outsourcing, or the “thickness” or frequency of the in-house-supplied value chain.

2. Mapping services inputs

Having defined the dimensions of the value chain to be analysed, the next step is to enumerate all services entering the value chain. The source reference for services entering production is the United Nations Central Product Classification, Version 2, Sections 5-9 (United Nations, 2013). The exercise at this point is relatively straightforward. It is merely a matter of identifying each of the services entering production on the value chain whose dimensions we have already delineated. The reason for using the UN Central Product Classification is that it allows us to keep tabs on the degree of disaggregation used in defining individual service inputs. This helps for comparison purposes across case studies.

Some of the identified services will be upstream from the manufacturing phase of production, some will be involved in the manufacturing phase, and yet others will be downstream, usually linked to conveying the product to the final consumer (it may be a product for consumption or an intermediate or capital good that subsequently finds its way into another production process). In mapping the services inputs, a distinction is required between in-house and outsourced supply. This distinction is crucial for later analysis.

Companies who agreed to be interviewed were not expected to reveal cost or price data in this exercise. Nevertheless, where possible we attempted, not always successfully, to obtain an empirical sense of the major service-based sources of value in the lead firm’s chain, along with an estimate of what the combined value was of services in the total cost of the production. In most cases these numbers were estimates, either where services inputs embodying value were not explicitly priced, or where inputs of certain services were supplied across many value chains within the same organizational structure. Examples of the latter include research and development expenditures, personnel services, security, telecommunications and utilities within shared premises. Where a firm is part of a conglomerate, the picture can be further complicated as a result of diffuse decision-making and a lack of knowledge on certain matters at the individual firm level.

In order to facilitate the analysis and comparisons among case studies, value chains were generally divided into six separate categories, not all of which were necessary relevant in all cases. Table 1.2 lists the categories and provides some brief illustrative examples of the numerous services falling within each of the categories.

Table 1.2. An example of how the stages in the value chain can be divided

Production stage	Examples of services inputs
Establishment	Government negotiations and license applications; land clearing and preparation; construction;
Pre-manufacture	Design; R&D, procurement and transport of inputs; customs services; licensing requirements for health, safety, and environmental compliance of inputs; storage of inputs;
Manufacture	Transport and handling of raw materials; testing; maintenance and repair of equipment; cleaning; utilities; compliance inspections for environment, health, safety, working conditions;
Post-manufacture	Packaging; transport; installation; advertising; marketing; branding; retail; quality control; standards assessment
Post-sales services	Repair and maintenance of machinery and other facilities; inventory and warehouse services for parts
Back-office services	Back-office accounting; legal services; personnel; insurance

A notable difference between the approach in this study and the UN's Central Product Classification (CPC) is that we have taken government interventions, mostly in the form of public policy, as part of the value-added in services story. The reason for taking this approach is two-fold. First, from an analytical perspective, government services are either directly or indirectly intended to provide social value in areas where the private sector or individuals acting alone or in communities cannot necessarily supply essential social goods, such as shared infrastructure, health, safety, environmental quality and social well-being more generally. These are sources of added value that it is incumbent upon governments to supply because these products embody spillovers, or what are sometimes referred to as public goods or externalities. For our purposes they may be seen as additive to the private sources of value generated by services along value chains that we are seeking to identify.

The second reason for identifying and treating policy interventions in this manner is that it provides the basis upon which to conduct the policy analysis that constitutes the final main section of this report. Moreover, it allows us to observe that although public policy in principle adds value, it may fail to do so where government services are provided inefficiently or at excessive cost (both in terms of money or time). This can occur as a consequence of inadequate resourcing of government services in terms of infrastructure, personnel or training; a lack of commitment and dedication to good service among personnel; and to poor governance that gives rise to perverse incentives for officials to seek rewards that impose private and social costs on society at large. Improved performance in any of these areas can generate policy innovation and become a source of productivity gains.

3. Additional information sought: outsourcing of services

As already noted, after defining the value chain under study the procedure requires identification of all services entering production (including upstream and downstream activities) and a determination of which services are outsourced to third parties and which ones are supplied in-house. The source of supply information provides the raw material for an analysis of the reasons and the degree to which

firms outsource in our selected value chains - why they do so or refrain from doing so, and if they do, to whom. Other information sought in interviews was more difficult to acquire, mostly because interviewees did not have it to hand, and obtaining it would have been more onerous than it was reasonable to expect from managers who were already giving generously of their time.

We sought information on bundling – the creation of a composite offering in the market place. A bundled offering is one that includes more than a single product. Strictly speaking, any arms-length transaction between independent parties comprises a bundle, which may be both services and goods combined, or an exclusive combination of one or the other. The reason that all third-party transactions can be considered bundles is that products offered for sale are made up of a combination of other inputs. The reason for being concerned about bundling is that it can be used strategically. Moreover, the possibility of bundling renders all services inputs tradable in principle. These issues will be discussed in relation to the case studies⁴.

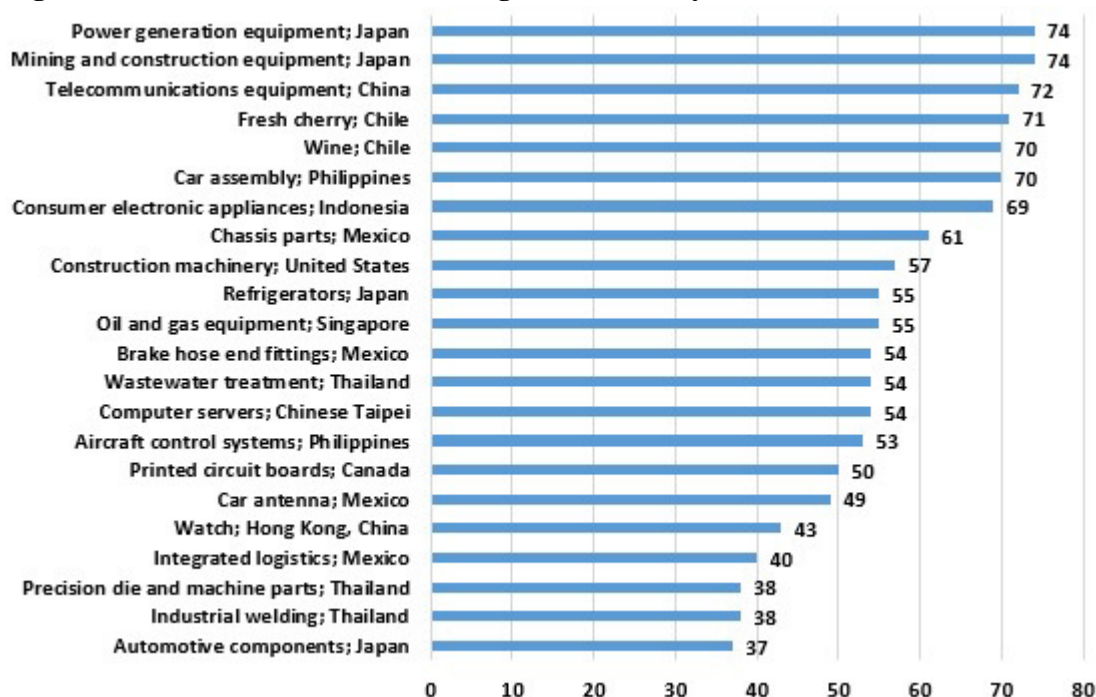
Patterns relating to services emerging from the case studies

For reasons already discussed in relation to the determination of the bounds of individual value chains, comparisons among the 22 case studies should be treated with some caution. Nevertheless, it is clear that the number and range of services entering the value chain as sources of value is considerable. Figure 1.1 depicts the number of services entering the value chains of each of the case studies. They range from 37 in the case of automotive components to 74 in the case of power plant equipment.

⁴ In the initial interviews questions were also asked about innovation, employment and policy impact. The last of these will be addressed in the section on policy. As previously noted, traditional thinking used to have it that manufacturing, mining and agriculture provided the most significant contributions to productivity growth and technological advancement, while services lagged behind. More recently, recognition has grown of the scope for advances in technology and innovation to foster productivity growth in services, as a standalone sector or as an integral part of others. The aspiration of the project had been to examine services inputs along value chains in terms of their technological content and their potential to contribute to innovation. It soon became apparent that it was infeasible to address innovation as an add-on to the core issues examined in the interviews, so the issue did not form part of the analysis. A separate project would be required to research this question.

Finally, an initial attempt was made to collect data on jobs attributable to services and to classify such jobs in terms of skill levels. The intention was to assess the level of technological sophistication associated with particular services inputs. Several problems arose with this. First, it was not easy in the space of time-limited interviews to secure an accurate attribution of jobs to specific service inputs. Secondly, the classification of skill levels was also problematic in that we lacked a standard metric to use across cases studies. Thirdly, it was not obvious what we would be able to use the information in the absence of any trend analysis, which was impossible to obtain within this framework. The effort was abandoned with the realization that the data would be difficult to obtain, an adequate analytical framework was lacking, and a different methodological approach was indicated.

Figure 1.1. Number of Services Entering the Case Study Value Chains⁵



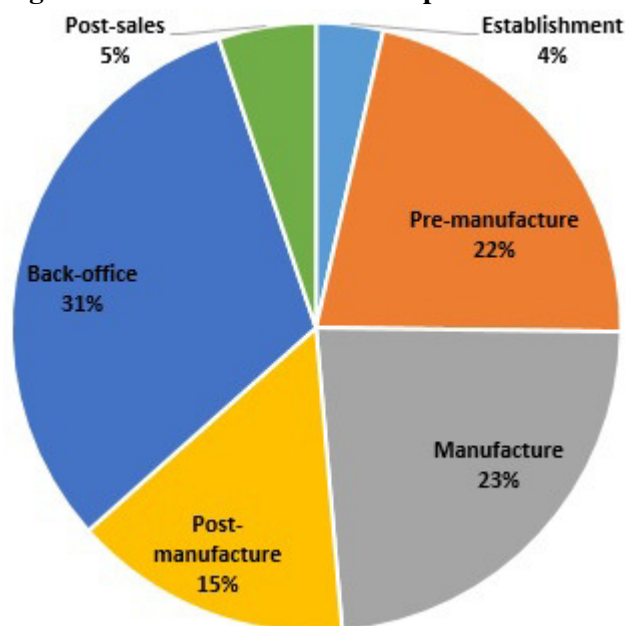
Source: Authors' computation

It proved difficult to obtain systematic information on the share of total value (cost) attributable to services, but numbers obtained ranged from anywhere between 30 per cent and 90 per cent.

Figure 1.2 looks at the distribution of service inputs across the different stages of the case study value chains. Once again, allowing for differences among the case study value chains that limit their comparability, back-office and recurrent services – which are mostly support services of one sort or another (see Table 1.2 above for an illustration) – account for one-third of service inputs. The manufacturing stage accounts for a further one-quarter of the total, followed by pre-manufacturing, post-manufacturing and sales, after-sales support, and establishment-related services in descending order of importance. The count of numbers of services involved in each production stage says little about their respective value contributions. In the case of after-sales services, those companies producing capital equipment with lengthy lifespans could generate more value from looking after the manufactures it has produced over 20-30 years than from any other single source.

⁵ The count in this Figure and in Figures 1.2 slightly differs from the count in the individual chapters because authors of each chapter had free rein to count the more disaggregated services classifications or the more aggregated one. The method in this summary report is to recount services based on the more aggregate grouping, in particular, the 'services' column in the Tables of services that enter the value chain from each case study. For example, one case study counted CPC 8313 (IT consulting and support services), CPC 8314 (IT design and development services) and CPC 8316 (IT infrastructure and network management services) separately, while this summary report counts this as only one (i.e., IT services). The main findings discussed in this report, however, remain the same regardless of the slight differences in the counts.

Figure 1.2. Incidence of service inputs at different stages in the case study value chains⁶



Source: Authors' computations

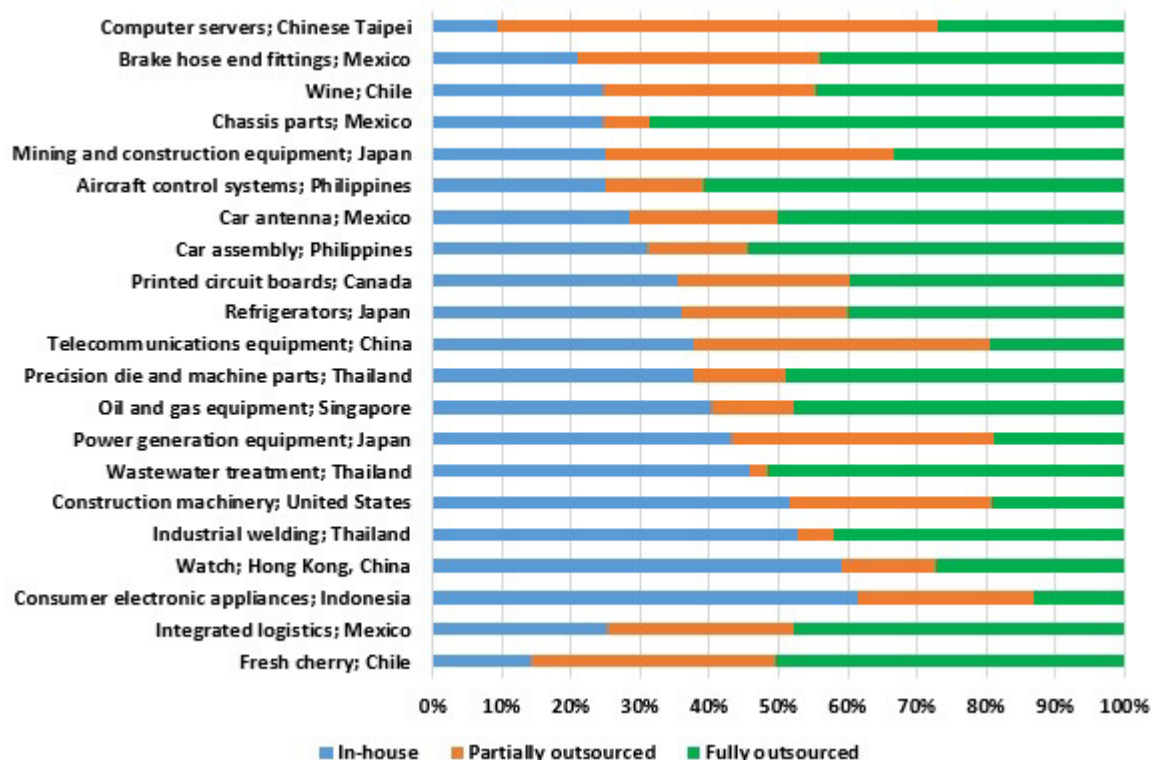
Outsourcing

For the case studies where data were available, a considerable amount of outsourcing of services occurred. The incidence of outsourcing was greater than we anticipated. Figure 1.3 highlights the results. Of the 22 case studies, 21 provided complete information on the share of services entering the value chain were supplied in-house, the share fully outsourced, and the share partially outsourced. No information on outsourcing shares was available for one of the case studies. Figure 1.3 reveals that for the case studies where information was available, there are only four cases where the share of outsourcing is less than 50 per cent. In many instances the share exceeded 50 per cent by a considerable margin, rising to 90 per cent in one instance.

Systematic information on the identity of these third parties was not available. In some cases the outsourced supplier was a government entity or an entity specifically designated by government to carry out particular regulatory tasks. In other instances, outsourced suppliers were part of a conglomerate structure to which the case study firm belonged. For the rest, outsourced suppliers were most frequently local enterprises, many of them small in size.

⁶ Figure 1.2 reclassifies some services in the different case studies into one of the six stages: establishment, pre-manufacturing, manufacturing, post-manufacture, back-office, or post-sales, because some authors used different terminologies for the stages in the value chain.

Figure 1.3. Shares of services supplied in-house or outsourced (%)



Source: Authors' computations

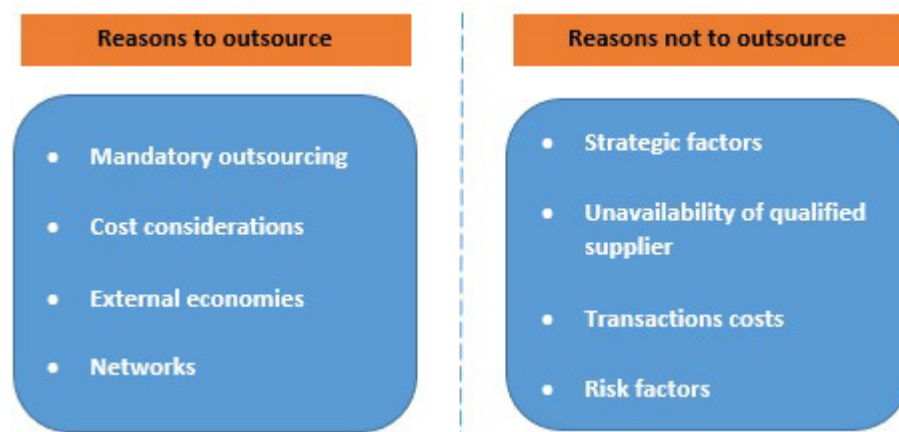
Both from a policy and a business perspective, it is instructive to consider why firms may or may not favour outsourcing when it comes to services inputs on value chains. In interviews with the case study firms, a range of reasons were offered, often expressed in different ways, but covered by the categorization contained in Figure 1.4 below.

As already mentioned, some outsourcing is the result of mandatory requirements. Regulations will typically specify the competent authorities to undertake functions such as auditing and compliance with certain health, safety and environmental services.

A core consideration when it comes to firms' outsourcing decisions is cost. In effect, if we were to take cost as an overriding consideration we could subsume a number of the other factors listed in Figure 1.4 under the cost rubric. But this would obscure both the real motivation for outsourcing decisions as well as clues as to what actions governments might take to secure more value chain-related activity in their own economies. For the present purposes, the starting point is that firms have finite resources and must decide how best to deploy them. Even where a firm is absolutely more efficient at competing in two activities, for example, it may pursue its comparative advantage and outsource the one that it is relatively less efficient at producing compared to third party suppliers. In other cases, an absolute cost advantage may exist for an outsourced supplier, and so other things equal, it would make sense for the firm to outsource.

Finally, a related argument concerns internal economies of scale. Production sometimes requires high fixed costs in the form of plant and equipment, for example, and production is zero without large initial investment. If the firm's requirement is for a small amount of the product, then high fixed costs will have to be allocated to a low level of production, raising the unit cost of output. In this case it is better for a firm to outsource to a supplier who can attain economies of scale.

Figure 1.4. Considerations Affecting Outsourcing Decisions in Global Value Chains



Another set of reasons for outsourcing is to do with the existence of external economies. Certain enterprises may specialize in particular activities which allow them to reap the benefits of focused attention on these activities along with others who do the same. These are interactive benefits from clustering that are beyond the control of any single firm and they render those involved in the particular activity more cost efficient and competitive. Typical examples of this in the services sector might involve aspects of information technology and other knowledge-intensive activities.

A related reason for outsourcing has to do with the advantages of networks in supply. A readily apparent example of this is security services. A single guard on a premises employed internally is likely to be less effective in dealing with security-related eventualities than a single guard with access to a network upon which to call as the need arises. This is why virtually all the firms in our sample outsourced security services.

Turning to reasons that cause firms to pause before outsourcing, or indicate that there are some services they would never outsource, strategic considerations loom large. Many interviewees identified key operations or activities in the value chains that were either too important or too sensitive to outsource. The important activities tended to be those considered defining features of the operation. The sensitive parts of the operation often involved proprietary information. For the most part, it is probably safe to assume that these are activities that are unlikely ever to be outsourced to third parties.

The availability of qualified supplier is another reason for eschewing outsourcing. Firms may want to outsource because it would allow them to focus more closely on key elements of their operations, but be unable to do so because they cannot find suppliers who are sufficiently low-cost in relation to specified quality requirements.

Other cost-related factors that may inhibit outsourcing concern expenses incurred by the firm in dealing with arm's-length suppliers that would not arise with in-house supply. These can be thought of as transactions costs. The two most obvious are search costs and supervisory costs. Search costs are to do with the identification of suitable third-party suppliers, which can be time-consuming and costly. Supervisory costs are ongoing, and require that the firm spends resources on making sure that outsourced suppliers comply with their contractual obligations.

Finally, a series of risk factors associated with ceding some control to outsiders will weigh on the firm and influence outsourcing decisions. The lead firm has to be confident that outsourced suppliers will be reliable and consistently so in matters such as quality and timeliness. A weak link in the chain can carry severe costs for the parent firm. More generally, firms worry about their reputation, which takes time to build and can be destroyed in an instant. They have to be assured that third parties are no more

likely to prejudice reputation than in-house actors. Finally, an additional and separate source of risk is failure to comply with government regulations. If the matter is in the hands of a third-party, the firm wants to know that the likelihood of a problem is minimal.

For governments and businesses in whose interest it is to reap the benefits of fuller participation in global value chains, one channel for doing so is through participation via outsourcing. This is not a topic for the present study, but a range of new participation and upgrading opportunities are likely to present themselves in appropriate policy environments. For governments in particular, actions aimed at ensuring an operating environment conducive to local competitiveness can make a significant difference. This is an area that may be of interest to APEC in the context of its work on SMEs.

Bundling

As previously argued, any arms-length transaction in the marketplace will involve products made up of composites of other products. The point here, however, is that bundling can involve an element of strategic choice. Four considerations are the most pertinent in this regard. The most obvious, perhaps, is bundling as a means of minimizing cost, where for example, joint production occurs and there is demand for more than one output. Second, bundling may serve as an instrument simply of adding more value by rendering the offering more complex. Third, bundling can provide a means of gaining temporary market advantage through product differentiation. Finally, bundling can be a means of fostering innovation, and if the innovation is proprietary, the product differentiation advantage will be more long-lasting. As noted earlier, since most of the observed bundling in the case studies occurred with arm's-length inputs provided by others, it was not possible to systematically trace incidences of strategic bundling.

1.4. Policy Implications

Services, as discussed above, are embedded in manufacturing value chains, from the pre-production phase all the way up to the delivery of goods. The case studies show that in some manufacturing value chains, services extend all the way up to the disposal of the product (or re-manufacturing in others), with maintenance and repairs service contracts sometimes lasting up to its end-life. Such intertwining implies that manufacturing and services policies affect each other, i.e., policies restricting one will have an effect on the competitiveness of the other and on the efficiency of the value chain⁷. The studies in this volume therefore asked the firms about the policy issues they face both in host economies and in markets where they sell their products. In addition to policy constraints, attention was also paid to noteworthy instances of cooperation between industry and government. The results from discussions with firms are summarized in this section.

The analysis of policy that follows focuses primarily on the perspectives of firms – particularly but not exclusively foreign firms – operating in various APEC economies. The paper does not attempt to analyse in any systematic way the public policy objectives underlying the interventions of governments. It is understood that such objectives are diverse. No judgement is intended as to the legitimacy of the objectives behind these interventions. Rather, the focus is more on how policies are designed and whether they embrace the most efficient, cost-minimizing manner of achieving their putative goals. Policies can be self-defeating if they are poorly conceived or excessively heavy-handed in application. Another key policy issue that the study touches upon is policy coherence among multiple jurisdictions. Diverse policy approaches and duplicative requirements can add significantly to costs and undermine competitiveness. In sum, the approach adopted in this paper is about efficiency and effectiveness, not legitimacy.

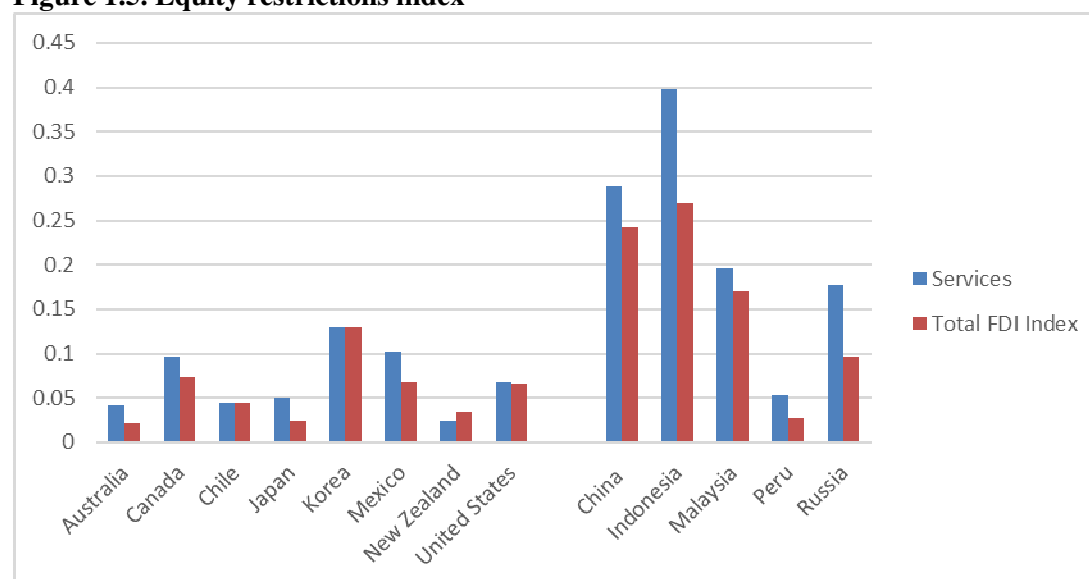
⁷ For example, some case studies find substantial correlations between investments in services and growth of manufacturing labor productivities (see Arnold, et.al, 2011; Fernandes and Paunov, 2008)

A general sentiment encountered among firms was the wish that services sectors were more open for foreign investment so manufacturing activities could grow better⁸. Labour mobility facilitation was another constant refrain because firms find that where they need to obtain visas or work permits for their employees, delays and uncertainty of obtaining them in a timely manner unnecessarily raise costs. The cost arises not only in terms of time and the money paid for application and processing but, more importantly, in terms of missed business opportunities or inadequate service to clients. Local content requirements are sometime unclear or are difficult to comply with when global firms cannot find local partners that meet their stringent technical standards. Skills development and matching were also a concern and is an area fertile for joint private and public sector collaboration. Effective enforcement of intellectual property protection and infrastructure improvements are other elements of firms' desirables. Finally, SME participation in global value chains is often stymied not only by inadequate access to finance but also by the difficulty of obtaining accreditation for sector-specific international standards.

1. Investment policy incoherence: manufacturing, yes; services, no

Equity restrictions in services are more prevalent and stringent than restrictions in manufacturing because many economies have preferential investment policies towards manufacturing investments. According to the OECD FDI Restrictiveness Index, the overall equity restriction index in services sectors is generally higher than the overall FDI index (Figure 1.5) and this is a trait common to both developed and developing economies. The thinking behind this duality in investment policies might be that manufacturing FDI is deemed to be employment generating, while services FDI can eliminate jobs and compete much more directly with domestic service providers. Think for example of professional services or retail distribution services, where most domestic participants are micro, small and medium enterprises that tend to benefit from the protective hand of governments. Whatever the reasons may be for the different treatment of manufacturing and services FDI, the GVC literature that has emerged is casting doubt on the usefulness of such policies, particularly because services are important for the competitiveness of manufacturing (see, for example, Arnold, et al., 2006, for empirical evidence).

Figure 1.5. Equity restrictions index



Source: PSU computation based on OECD FDI restrictiveness index.

⁸ An APEC Business Advisory Council (ABAC) survey of business executives in the region corroborates this sentiment. For details, see ABAC (2014)

Forms of investment restrictions

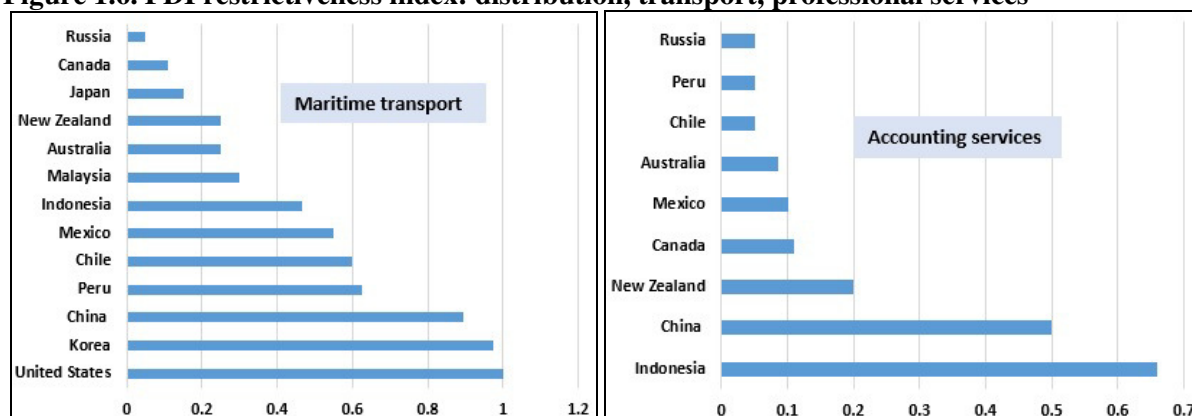
Besides equity limitations, other forms of FDI restrictions are screening of foreign investments, restrictions on key personnel, and limitations on firms' operations. Screening of foreign investments can include the stipulation of minimum capitalization requirements, the need for cabinet-level approval, or the imposition of an economic needs test. Related to these are restrictions on key personnel (discussed later below), restrictions on land ownership, and other sector-specific limitations. For example, in construction services, even if there is no statutory limit on equity ownership, if the conditions for granting a contractor license or an engineering license are too restrictive for foreigners, the sector becomes effectively closed to foreign investment. Appendix A Tables A.1 to A.3 list restrictions in selected APEC economies in some important manufacturing-related services such as logistics, and wholesale and retail distribution. The tables show that in domestic transportation services and customs clearance, the majority of the economies allow only partial foreign ownership, while warehousing is mostly open for foreign investment. More APEC economies allow 100 per cent foreign equity in distribution services, but with conditions in some economies

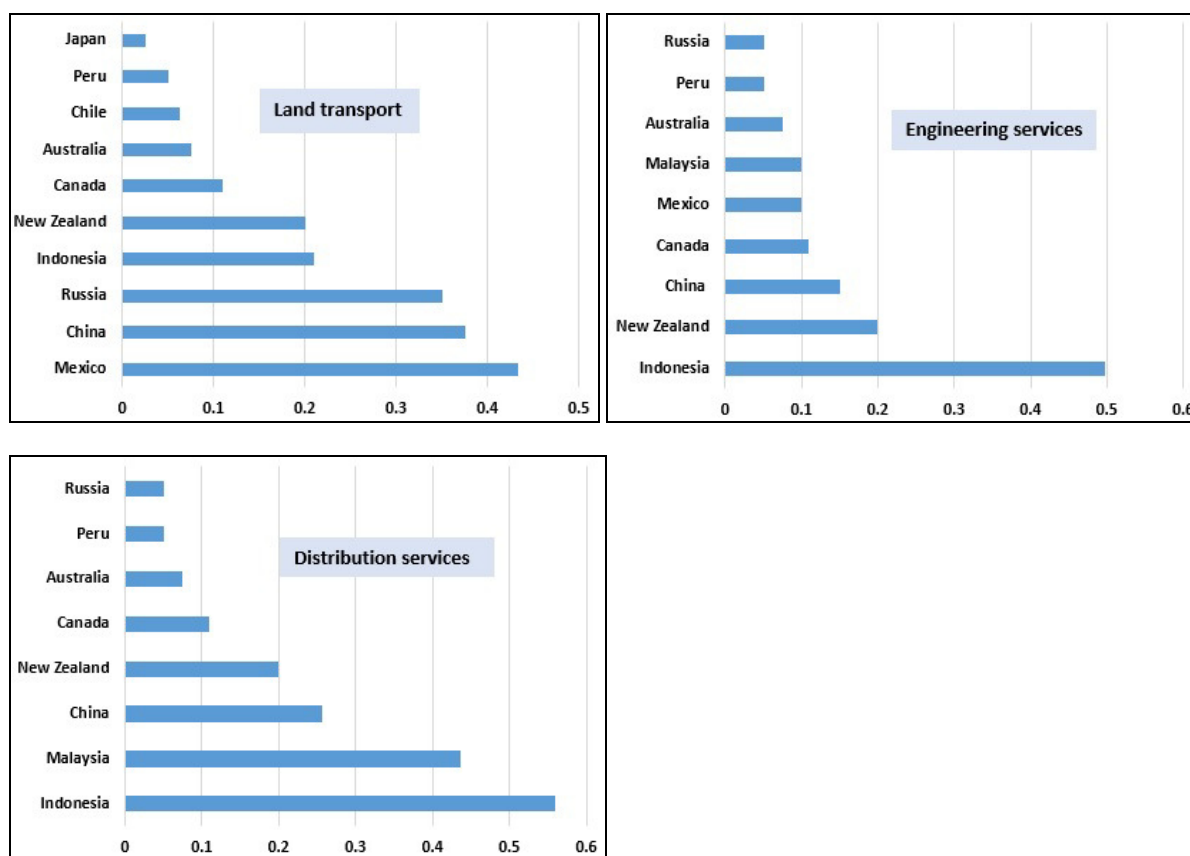
FDI restrictiveness index

The FDI restrictiveness index provides a comparative assessment of lack of openness based on various forms of restrictions in different service sectors. Figure 1.6 shows the index for distribution services, transport, and selected professional services. Among the economies in the sample, Indonesia appears to have the most restrictive investment policies in distribution and professional services, while Mexico and the United States are restrictive in land and maritime transport, respectively.

Of the different elements of the index, equity restrictions, be it in distribution, transportation or professional services, are the biggest contributor to the high FDI index in economies like Indonesia or Mexico (for land transport) or the United States (for maritime). Among the sectors with the highest barriers to FDI are distribution, construction, media, communications, financial services, business services and real estate investment (see Appendix C). Except for media services, all these service sectors figure considerably as manufacturing-related services in the case studies in this volume and, as shown in Appendix B, have significant shares of value added in the industry sectors to which the case study firms belong.

Figure 1.6. FDI restrictiveness index: distribution, transport, professional services





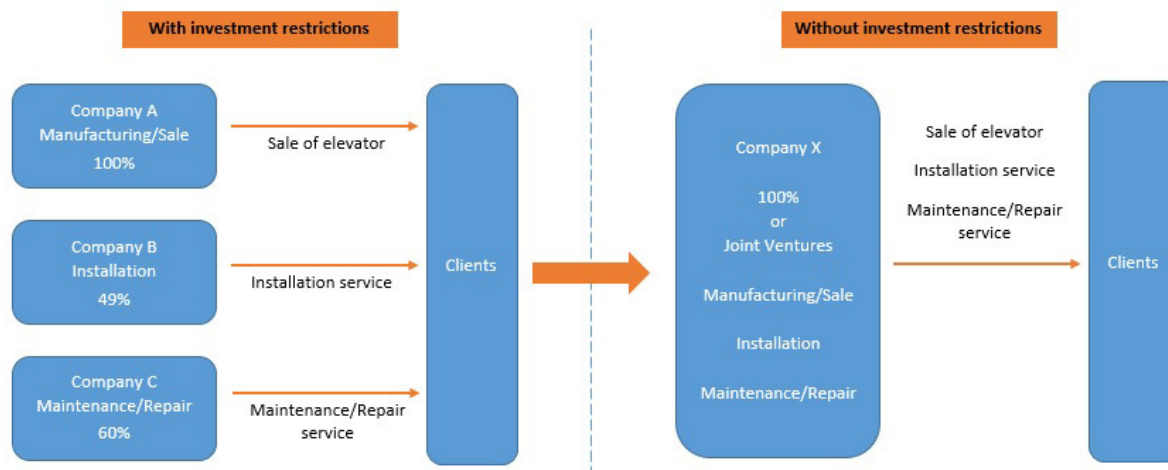
Source: PSU computations based on OECD FDI Restrictiveness Index

Effect of policy incoherence

How does investment policy incoherence affect the operations of regional and global value chains? The example of Japanese GVCs can illustrate the problem. Tier 1 suppliers of Japanese MNCs usually try to follow the GVC lead firm wherever it invests. Thus, for example, major component suppliers for automobile manufacturing follow a major car manufacturer to where it locates, thus replicating the supply chain efficiencies in the home economy. However, service suppliers of the lead firm may be unable to follow because of FDI restrictions. While partnering with domestic service providers also benefits foreign companies because they provide local knowledge and a network of domestic contacts, for many lead firms, the challenge is finding the right local business partner.

Differences in FDI restrictions not only between manufacturing and services but also among service sectors prevent foreign companies from operating what they deem the most efficient business model. Figure 1.7 provides an example of how a company that can have an integrated operation, from the manufacture of elevators to installation, maintenance and repair (right panel) may be prevented from doing so because of equity limitations in installation, or maintenance and repair services.

Figure 1.7. A forced business model?



Source: Adapted from Shiino (2015)

It is, however, also possible that some companies prefer not to establish an integrated operation but rather outsource some services to third parties for reasons cited in Figure 1.4 above. For example, construction equipment manufacturers⁹, even as they take upon themselves the obligation of supplying machine parts and components needed for repair, nevertheless prefers to rely on a network of trusted distributors in different economies to take charge of equipment maintenance and repairs. In this case, the firm invests heavily in the network relationships as well as in providing the technical training of its distributors in order to provide their customers with the same quality service they would receive if the lead firm itself were to carry out the service.

Box 1.1 provides other examples of how FDI policies affect foreign operations and how changes in investment policies can upset business plans. These experiences, which are taken from the case studies in this volume, illustrate how sudden changes in investment policy can freeze expansion plans, or how they increase costs by forcing companies to do things they would not have otherwise done based on efficiency considerations.

2. Labour-related restrictions

The need for non-resident service suppliers to enter foreign markets, whether for short- or long-term periods, has become more important with the internationalization of production. Global companies have organized themselves into specialized hubs and draw skills from these different hubs when they develop new projects, undertake research, or supply customer services including maintenance and repairs. This means that large flows of people crossing frontiers have become a normal feature of modern global business and are necessary for the flow of goods, services, and knowledge.

Forms of labour restrictions

Restrictions on labour mobility take various forms. They can appear as labour quotas, economic needs tests or the lack of recognition of qualifications. At times, procedures for obtaining visas and permits can be costly and complex, requiring copious documentation, and involving long delays. Opacity in the decision-making process and uncertainty arising from discretionary decision-making procedures

⁹ See Pasadilla (2015) and Tait and Gereffi (2015)

for granting or rejecting visa applications are often impediments in themselves. Table 1.3 provides some information on labour restrictions from the case studies.

Box 1.1. Business effects of FDI restrictions: examples from case studies

- *Sharing of back office facilities by affiliated companies prohibited.* On efficiency grounds, the case study firm wanted its newly established subsidiary to share some back office functions with the group's existing company. Local regulations forced the plan to be scuttled because the law requires any registered company to be completely equipped with all back-office functions and a stand-alone office address. If two companies within the same group were to share certain functions, formal transactions would need to take place, meaning that formal contracts would be required. From the company's perspective, this regulation simply augments costs and lowers efficiency (Cheung, 2015).
- *Requirement to have a local partner.* An oil and gas equipment manufacturer said that to be able to bid for a contract or to respond to a Request for Quotation (RFQ), it is sometimes legally required to have a local partner. Depending on the market involved, this requirement can lead to an increase in the firm's costs and higher price bids, thus potentially making it less competitive. Even if it were to win the contract, the cost would have been higher for consumers. However, in some cases, the firm itself prefers to work with a local agent because the latter has specific knowledge of the customer and local market conditions. The challenge in many places is finding suitable local partners who can add value to what the firm offers (Wirjo and Pasadilla, 2015b).
- *Unpredictable policy changes.* A newly enacted government policy in one ASEAN economy restricts foreign equity ownership for wholesale, distribution and after-sales services to 33 per cent. This change affected the planned recapitalization by this case study firm that manufactures 'white goods'. The firm had established a local distribution subsidiary in the economy years before the new rule was promulgated. The firm's existing equity is 67.5% while its local partner has 32.5%. While grandfathered from the application of a one-third maximum foreign equity holding as per the new policy, any change to the ownership proportions would eliminate grandfather rights. The firm's plan to recapitalize could not be carried out because the local partner was unwilling to inject more capital into the enterprise (Sit, 2015).
- *License restrictions and limited availability of proper services.* The law in one ASEAN economy restricts foreign licenses for services companies, for example, wastewater treatment services. A die manufacturer located in the economy, however, tells of the limited number of licensed industrial waste disposal companies which can properly treat the type of waste that the firm produces (Cheung and Wirjo, 2015). In some cases, firms have to build their own wastewater disposal system within the factory, with the help of their long-standing environmental service provider from their home economies, to remove any reputational risk of not being environmentally friendly.

Table 1.3. Samples of labour mobility restrictions

Type of labor policy	Description
Quota	<ul style="list-style-type: none"> • Singapore imposes a maximum to the number of foreign workers that a firm can hire, depending on the sector¹⁰. For the manufacturing sector, the quota for foreign workers is set at 60 percent of employment. Once a firm has reached its quota for foreign workers, it has to employ more local workers to be able to hire additional foreign ones. The shortage of manpower sometimes leads to delays in project completion or to poor service delivery. • Mexico requires that 90% of employees are Mexicans
Economic needs test / conditions for granting work permit	<ul style="list-style-type: none"> • Under Thailand’s Alien Working Act, B.E. 255 (2008), which governs the employment of foreign labor, the government stipulates that for every THB 2 million paid-up capital, a company can employ one additional foreign employee up to a maximum of ten. If a company wishes to employ additional foreign workers, it has to employ more than 100 local personnel, or pay at least THB 3 million in corporate income tax, or export at least THB 30 million worth of goods, or have brought in more than 5,000 foreign tourists during the previous year. • Firms in Singapore have to consider nationals for professional, management, and executive positions first. The job needs to be advertised in a jobs data bank administered by the Singapore Workforce Development Agency (WDA) for at least 14 calendar days before making an Employment Pass (EP) application. • Indonesia’s parliament is considering a language test requirement for managers and directors which, if approved, effectively puts restrictions on foreign directors, putting unnecessary burden on them in carrying out their responsibilities.
Complex requirements for visa and permits, and discretionary decisions	<ul style="list-style-type: none"> • One case study firm said that in their host economy, applications for both work permits and non-immigrant visa for foreign workers require the submission of 11 supporting documents, are processed slowly, and are ultimately awarded on a discretionary basis.
Recognition of qualifications	<ul style="list-style-type: none"> • ASEAN has mutual recognition agreements for some professional services, but none for technicians like welders who have to pass a professional exam in Thailand based on standards laid out by the International Institute of Welding (IIW), and must be trained in

¹⁰ More information about the quota for foreign workers can be obtained at: http://www.mom.gov.sg/Documents/services-forms/passes/Guidelines_on_Levy_Bill_Computation.pdf

	occupational health and safety (OH&S) practices. Though neighboring economies also use IIW standards, they do not recognize each other's government licenses and OH&S processes.
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Source: Compiled by authors from case studies and other sources from individual economies.

Inflexible labour policies

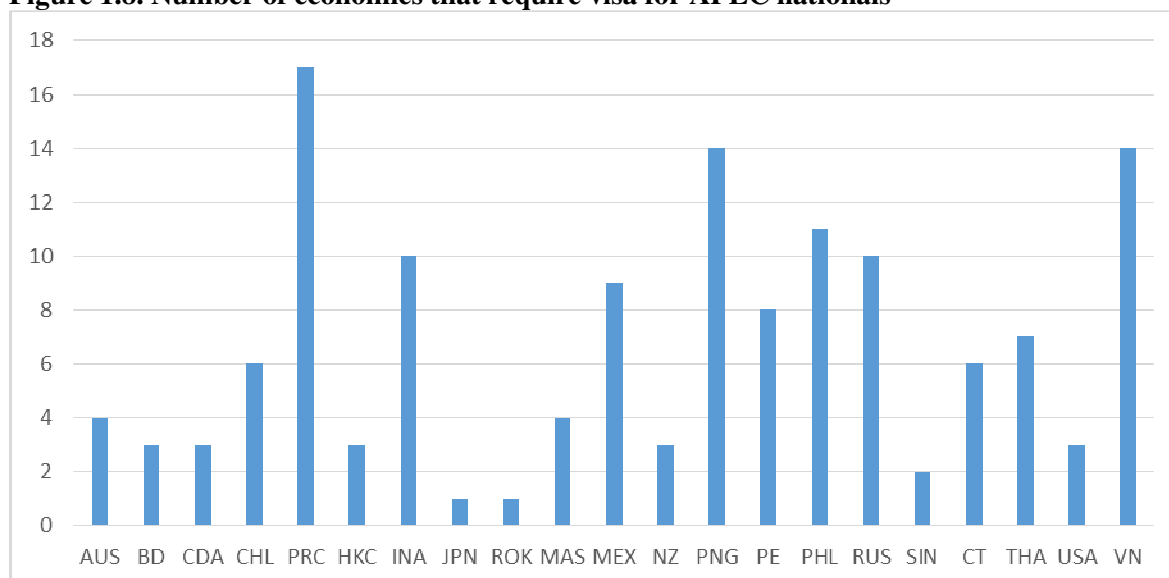
Though not related to labour entry per se, some firms in the case studies also mention inflexible labour policies in certain economies, especially with respect to the hiring of contractual or temporary workers. Contractual hires can be useful during peak periods of production. However, in the Philippines, current labour law prohibits the hiring of contractual workers if they do not receive the same benefits accorded to permanent employees. Likewise, only a maximum of 20% of labour are allowed to be on contractual terms. Worker lay-offs are not possible without a 30-day notice to the Department of Labor and without consulting the labour union (Stephenson, 2015). In Indonesia, rigid labour laws on compensation reward seniority over performance. For example, Article 156 of the Manpower Act¹¹ imposes strict rules on severance compensation pegged to years of service rather than performance, making it difficult for firms to incentivise productivity among workers. The case study firm thinks that more flexibility on compensation issues could help to promote productivity among its workers (San Andres, 2015).

Effects of labour restrictions

Having different visa restrictions for different economies makes the playing field uneven for business competitors in the region. Consider Figure 1.8, which shows that nationals of some economies can practically travel anywhere in APEC because they face very few visa restrictions. Citizens of Australia, Brunei, Canada, Japan, Korea, Malaysia, Singapore and the United States encounter only 1 or at most 4 territories where they are required to obtain an entry visa. On the other side of the spectrum are citizens of China, Indonesia, Mexico, Papua New Guinea, Philippines, Russia and Viet Nam who face visa restrictions in almost all other APEC economies. This difference in access to territories results in an uneven level playing field for firms located in these economies. For example, if a company wants to submit a bid in response to a tender where the presence of an all-star team of experts during the tendering process can boost the chance of winning a contract, the inability to secure a visa for everyone in its technical team can lead to the loss of a potential contract (see Box 1.2 for examples of effects of labour mobility restrictions).

¹¹ Act of the Republic of Indonesia Number 13 Year 2003 Concerning Manpower.

Figure 1.8. Number of economies that require visa for APEC nationals



Source: PSU compilation

Box 1.2 provides anecdotal evidence of how visa delays and restrictions or a lack of mutual recognition of qualifications hamper companies' ability to provide the best service they could give. In some cases, this has resulted in the loss of a good business opportunity, like winning a contract or the possibility of regional expansion. Almost all firms in the case studies have indicated problems associated with moving their technicians abroad because of visa issues. In one car component manufacturing firm located in Mexico, for example, its Japanese technicians had to exit several times to the United States to obtain re-entry visas, in order to remain in Mexico for the period required by the company (Wirjo, Pasadilla and Bassig, 2015).

Box 1.2. Anecdotal evidence of labour-related pains

Missed opportunities

- A telecommunications equipment manufacturing firm based in China sometimes participates in a call for tender in other economies. But visa applications affect the firm's ability and effectiveness to participate in these overseas tendering processes. When a project is sizeable, a technical team with personnel from various divisions is normally required to be present to assist in the proposal submission and to demonstrate what the firm is capable of doing. But Chinese nationals need a visa to go almost anywhere. The cost and uncertainty associated with obtaining visas in time has made it difficult for the case study firm to deploy the necessary number of persons for tendering and has hampered its ability to exhibit the firm's full capabilities (Zhu and Pasadilla, 2015).
- A multinational subsidiary based in Thailand engaged in the manufacture of welding alloys and cladding services finds regional expansion within ASEAN difficult because of a lack of recognition of qualifications of welders. In Thailand, welders must pass a professional exam based on industrial standards laid out by the International Institute of Welding (IIW). On top of this, welders must be trained in Thai OH&S (occupational health and safety) practices. These requirements consume a significant number of man-hours plus idle equipment because these have to be used for the audit instead of being used in the factory. For the firm to operate in neighbouring economies, it has to send its welders and equipment away to repeat the licensing and OH&S processes all over again, even though places like Malaysia follow the same standards from the IIW. Internationally consistent industrial standards, along with mutual recognition of licenses and safety training based on these standards, is regarded by the firm as a policy reform that would most facilitate additional regional business through trade (Haines, 2015).

'Sub-optimal' service

- A thermal equipment manufacturing firm based in Japan sometimes needs to dispatch an engineer within 24 hours to fix malfunctioning equipment and to avoid a power plant shutdown. But in a few economies where Japanese nationals need a visa, it takes time to send the necessary personnel. Though the cost and the application procedures are not considered burdensome, the time the process does create a problem even for big MNCs. The firm thinks that minimizing the visa processing period would greatly help, particularly for short-term and temporary stays of intra-corporate transferees (Pasadilla, 2015).
- A firm that manufactures equipment for oil and gas extraction based in Singapore needs its staff to travel seamlessly from one location to another to provide installation and commissioning services, do repairs and maintenance, or undertake training services. All these after-sales services make up a significant share of the firm's business. However, it often encounters challenges in obtaining visas, resulting in situations where the most qualified staff are unable to provide the requisite services (Wirjo and Pasadilla, 2015b).

3. Localisation and human capital constraints

Many governments provide incentives and subsidies to attract FDI. At times, however, protectionist policies force FDI to locate and increase operations domestically through the imposition of local content requirements. Such regulations add to operational costs especially when local suppliers are not necessarily the most efficient or the ones who provide the most competitive services. However, given government regulations on local content, foreign firms are sometimes forced to accept an uncompetitive local suppliers' bid, knowing that its production costs will increase in the process, and that these costs will either have to be absorbed through lower profits or passed on to customers.

An example of a specific local content requirement serves to further illustrate the costs that such policies can produce. In Indonesia, the government passed a regulation that requires importers of 4G LTE smartphones, starting in 2017, to use 30 per cent of local content in production. For the telecommunication equipment manufacturing firm in the case study, complying with such a regulation would mean that its sales subsidiary in Indonesia will undertake not only sales and distribution but also the assembly of components and parts imported from its parent firm. Since assembly costs are lower in its Chinese factories, this arrangement will result in higher production costs and make the smartphone uncompetitive.

For other firms, satisfying local content requirements means involving more local companies in the value chain. While most interviewed firms indicated that, where possible, they prefer to work more with local companies, they cannot always find companies in the host economy that satisfy their stringent technical requirements. For example, the manufacturing subsidiary of a 'white goods' producer disclosed that local firms can only provide basic manufacturing services. At present, the firm needs to ship plastic powder to China or Malaysia where it will be transformed into, say, air-conditioning casings, before importing the more elaborated product back to be assembled in the ASEAN economy concerned. Simply put, local capability is missing.

Part of the reason for this is the small pool of quality engineers and experienced managers relative to those in developed economies. In turn, this is connected to the quality of education in the respective host markets. For example, a subsidiary of a Japanese manufacturing company in Mexico said that it has to pay significantly higher costs to hire skilled engineers because of their scarcity value. Another firm indicated that it is not easy to persuade Japanese staff to relocate even with strong incentives, so it hopes to find competent local managers to eventually take over from the current Japanese staff (Wirjo, Pasadilla and Bassig, 2015). In Indonesia, a pending local content requirement that would apply to software, R&D and design development will augment costs because of the difficulties of finding enough qualified researchers locally.

Human capital development and skills matching are important to support manufacturing and service facilities. There are examples in the case studies of fruitful collaboration between government and private firms in improving the availability of skilled persons to hire in the economy (see Box 1.3). Some firms independently provide in-house training to upgrade the skills of their workers. Besides sending Japanese engineers to do training and give technical guidance, the firm concerned has set up local training centers to nurture local engineers, as well as sales and support staff. The company has also promoted locals to top management, including in China, Indonesia and Thailand. Foreign companies often point to the high cost of hiring expatriates as opposed to locals, which gives them the incentive to hire and train local staff wherever possible.

Box 1.3. Public-private partnership in human capital development

Collaboration with vocational schools

- Skilled and semi-skilled labour are very important for the Philippine-based firm engaged in manufacturing aircraft components for Boeing, Airbus, and other aircraft manufacturers. Being close to the educational centre in the northern part of the Philippines, the firm has access to a potentially skilled supply of labour. For additional training, the firm sends its employees, many of them with a minimum 3 years of engineering education, for six months of schooling at the government-run Technical Education and Skills Development Authority (TESDA) schools to become machinists. The firm's wage structure is competitive but, occasionally, some staff move to other firms in the Philippines or abroad. To ensure the supply of machinists, the firm collaborates with the TESDA schools by providing inputs in its curriculum, thereby strengthening TESDA's vocational training program and by taking in some TESDA students for paid internships. In the process, TESDA graduates become a reserve pool of labour. The firm provides possibilities for promotion and career growth to keep good workers, especially because it takes years to build the necessary expertise in their workforce (Wirjo and Pasadilla, 2015a).

Skills certification system

- Chile has established a program providing a framework for the recognition of competencies. Both public and private stakeholders from 15 different industries are involved in the program. Since 1998, more than 500 occupational standards have been established and 10,000 workers have been certified annually. In the wine industry where the case study firm belongs, the system has identified the skill profiles required for the majority of jobs performed in the industry. Since 2010, the firm has awarded more than 4,500 workers with certified skills in the wine sector. Skills certification in the wine industry or in any industry facilitates the portability of skills, decreases uncertainty in the hiring process, confers credibility in relation to workers' abilities, and most importantly generates pride among certified workers in a culture of lifelong learning and development (Fernandez-Stark and Bamber, 2015)

4. SMEs in GVCs and standards conformity

Standards, both public and private, have an important role to play not only in promoting public policy objectives (e.g. safety, sanitation) but also in addressing information asymmetries and often in signalling quality. For example, in the oil and gas industry, firms must adhere to the standards and requirements of the American Petroleum Institute (API), which is a private trade association with more than 500 standards and recommended practices. API's Monogram Program verifies that manufacturers of equipment are operating in compliance with these standards and its Witnessing Program provides witnesses to observe critical material and equipment testing and verification. Many manufacturers like to have the API Monogram mark on their products because it serves as a form of quality assurance to their customers, some of whom even require this mark.

However, standards can impose additional unnecessary costs. Sometimes, a lack of clarity in standards requirements adds uncertainty in testing and certification requirements and procedures. At other times, duplicative testing and accreditation in various jurisdictions multiply costs both in terms of time and money without actually yielding additional information or public policy advantage. An example is the number of certifications and accreditations that the aircraft component manufacturer in the case study sample has to undergo with different civil aviation authorities to provide after-sales

service to airline companies. Complying with these requirements means that the firm has to be audited by approximately 6 to 7 different regulatory agencies in the region annually. To obviate the need for repeat accreditation processes, some economies could enter into mutual recognition agreements. For example, the Department of Civil Aviation (DCA) Malaysia and Civil Aviation Authority of Singapore (CAAS) do not need to audit the case study firm's repair station in the United States because: 1) the US repair station has certifications from the Federal Aviation Administration (FAA), the European Aviation Safety Agency (EASA) and the Civil Aviation Administration of China (CAAC); and importantly 2) Malaysia and Singapore each has a bilateral agreement with the US for recognition of these certifications. In the case of the same US company's repair station in the Philippines, despite also having certifications from FAA, EASA and CAAC, Malaysian and Singaporean authorities carry out the regulatory audits because the three economies do not have a mutual recognition agreement. The case study firm holds that the issue is no longer about capacity or standards because this had been proven through the FAA, EASA, and CAAC certifications, but is merely 'regulatory bureaucracy'.

If big multinational companies find certification processes burdensome in some cases, the situation can only be worse for SMEs with far less resource capacity to meet the cost of repeated audits, particularly if the auditors have to be imported. Standards and certification procedures can represent a hurdle sufficiently high to frustrate the hopes of SMEs for a chance of doing business with large global firms. For example, SMEs wishing to supply basic manufacturing business to the aircraft component manufacturing company in the Philippines need to pass the certification of the National Aerospace and Defense Contractors Accreditation Program (NADCAP) and demonstrate compliance with different category-specific (for example, conventional machining and welding) checklists. In turn, each category-specific checklist involves detailed and complicated requirements. Additionally, the audit is not one-off but repeated every few years, depending on the requirements of the accrediting organizations.

Going through certification for GVC participation also sometimes implies acquiring costly equipment which the limited size of the local market cannot justify. Thus, a standstill situation results, where MNCs find a lack of capability among local companies and local companies (especially SMEs) find doing business with GVCs beyond their reach.

Domestic and institutional issues also saddle SMEs far more than foreign firms. While foreign firms have the capacity to comply with regulations and enjoy preferential benefits from being located in special economic zones, and have access to better infrastructure, SMEs often have to contend with the shortcomings of the local institutional context, such as poorly functioning financial markets and poor infrastructure, among other factors (Bamber, P, et. al, 2013).

5. Intellectual property

For developmental purposes, some economies want local transfer of technology (and intellectual property) whether for imported components or for manufacturing. The compliance requirements resulting from regulations associated with these objectives has either spurred creativity in contracting agreements between foreign and local partners, or has barred the host economy from obtaining advanced technology.

A Japanese company manufacturing thermal equipment resolved the potential difficulty of technology transfer by forming a joint venture company in China. The local company is then licensed for the use of its proprietary technology with restricted conditions, i.e. only for the purpose of manufacturing for a specific market (exclusive market agreement). As long as the local partner is reliable and qualified both in the technical and business sense, and the regulatory framework and government enforcement of IPR is effective, a simple licensing agreement is sufficient to protect intellectual property (with or without a joint venture agreement). In the case referred to above, the joint venture structure added an

additional layer of protection for the company. This company is aware, however, that other enterprises have experienced leakage in the use of their IP by their local partners. These latter companies have found machines being sold in other Asian markets that made use of their licensed technology when it was supposedly restricted to goods produced for China.

Another example of how technology transfer policy has subverted the attainment of its avowed objective is the case of one economy which implemented new standards on 13 categories of IT-related products in 2008. The new standards regime required that certain information relating to source codes be submitted for the (consumer) products that use these IT components. The guidelines are not very clear on the extent source codes shall be disclosed. But in order to minimize risk and protect its most up-to-date technology from source codes disclosure, one case study firm decided not to sell its most modern product models in the economy concerned. The effect was to deprive the market of the technology and knowledge transfer it wanted.

IPR enforcement capability is another issue that several case study firms brought out. Counterfeit products are commonplace in Asia and have become a threat to one case study firm's car accessory business. Other firms complain about trademark infringement because local competitors (possibly deliberately) use logos, industrial design, or packaging that can be confused with their own products. Lengthy patent application processes is another issue that begs resolution.

6. *Infrastructure bottlenecks*

There is a widely recognized urgent need to upgrade port and road infrastructure so that port services and transport services can be more efficient in coping with current and future needs. Bottlenecks from congested port and transport infrastructure add significantly to cost and time delays. Cheap and constant electricity supply is also indispensable for manufacturing operations, but in some economies outages disrupt manufacturing activities.

Many APEC economies have already come a long way in improving their infrastructure. Mexico, relative to the situation 20 years ago, now has several large ports and allows foreign investors to manage its ports. Indeed, Mexican ports now serve as good substitutes for saturated US ports such as those in Los Angeles, California or Houston, Texas. During the recent labour turmoil affecting the Californian port, one case study firm found it cost-efficient to bring its products from Japan to the Mexican port, and then send the products from Mexico to the United States by land.

Chile gives another good example of how infrastructure-related reforms have shortened its distance from the Asian markets (see Box 1.4).

Box 1.4. Chile's infrastructure reform

Despite considerable distance from its major markets, logistics costs are lower in Chile than in many competing economies. High import and export volumes and a liberalized transportation sector have fostered competition amongst logistics providers, which has helped reduce costs. The modernization of the Chilean ports following their privatization, which began in the late 1990s, has significantly contributed to the economy's capacity to rapidly export large quantities of products. There are numerous ports along its coast, reducing costs and distances for land transportation.

Online processing with the implementation of the single-window system has improved the efficiency of customs clearance, reducing unnecessary delays at the ports. This has helped to circumvent issues such as strikes of customs staff at the ports. The firm is able to complete all customs formalities online and deliver the wine it produces to the international transport company. This helps to prevent disruptions in the on-time delivery of wine to foreign distributors.

Source: Fernandez-Stark and Bamber (2015).

7. Government services and trade policy affecting goods trade

The above discussions have alluded to the role of government policies and services in either hampering or helping growth. All case study firms brought out issues related to goods trade and these are summarized below. Such issues also touch upon regulations that affect services because, as discussed, services are embedded in goods and it is no surprise that even though questions addressed to firms were on policies affecting manufacturing-related services, some of their answers applied largely to goods.

Transparency, multiple layers of authority, and predictability of regulations

Foreign companies have to spend a lot on information, particularly information on regulations, because either government policies are not transparent or the requisite regulations applicable to their business involve multiple government agencies. For example, the energy generation equipment manufacturing firm in the case studies needs to deal with environmental issues, land ownership, various permits, and local tax laws, to cite a few. In some economies, it is not straightforward where, how, or from whom to obtain the relevant information. Similarly, a car assembly company based in the Philippines has to deal with no fewer than ten different government departments involved in various aspects of vehicle assembly and subsequent sale, ranging from issues on incentives, the granting of various permits, implementing environmental and technical standards, determining and enforcing fuel standards, labor laws and vehicle registration, and other issues (Stephenson, 2015).

While some governments are more efficient than others, inefficiency and delays in government services can disrupt company plans and targets, and impose significant costs. An example is the delay in the construction of a power plant caused by the inability of a government to evict or transfer dwellers from the construction site. If the power plant equipment manufacturer were left unaware of the project delay, it would be saddled with unplanned inventory storage and maintenance costs of bespoke equipment, not to mention transportation costs if the equipment had been already shipped. If

it were informed of the postponement, the costs to the company would cascade down to all their suppliers and also affect the schedules of its global subsidiaries involved in the manufacture of components for the bespoke equipment. Most of the factors causing delays are already difficult for foreign firms to observe or anticipate, and it is worse if the government is not transparent.

Another typical issue with government services is frequent changes in laws and regulations. For example, a subsidiary based in Mexico cited new tax laws and regulations promulgated in December 2013. The firm had been trying to comply with these revisions but indicated that constant revisions had made it challenging for its staff to understand and comply. There were instances when the company thought that it had already complied with everything only to find that the laws and regulations had been revised yet again. Another example is the recent requirement to maintain electronic accounting records and make a monthly submission of a general ledger to the tax authorities, as well as submitting digital invoices of transactions involving all taxpayers. In the process, the government revealed itself to be unprepared to receive the resulting quantity of information. Consequently, the regulation is again being revised.

The enforcement of the regulation, or the lack of it, is another source of uncertainty. In the wastewater treatment services case study (Hassani and Wirjo, 2015), the lack of enforcement of environmental laws and regulations, for example regarding maximum allowable limit for treated wastewater discharge in public domains, results in a poor take up of environmentally friendly technologies by domestic firms. Because government regulators rarely check the quality of industrial discharge into public domains, only the firms that care about the reputational risk – usually from their own home economies - from not using proper wastewater treatment processes, or have corporate social responsibility (CSR), end up following the legal limits.

Same old customs issues: procedures, single-window, re-manufacturing goods, standards

Customs issues such as disagreements over valuation – for example, whether royalties should or should not be part of the dutiable value of the product, or a lack of effective implementation of single-window projects after millions has been spent on the project – are familiar issues in trade policy. Complex customs procedures along with the discretionary aspects of some customs decisions may necessitate the employment of customs brokers who know how to work the imperfect system. Thus, despite automation and the adoption of single-window systems, costs of human intervention in customs transactions persist – the very costs that modernization was designed to eliminate.

The absence of agreed international standards on the definition of goods, especially re-manufactured goods, frustrates one case study firm's re-manufacturing business worldwide operation and obliges it to sell remanufactured parts and equipment in fewer economies (Tait and Gereffi, 2015). Trade in re-manufactured goods is banned in some economies. The avowed intent is to protect customers from low-quality products and prevent the importation of electronic waste under the guise of used products. Clear standards and definitions for re-manufactured goods would go a long way to promote the resource and environmental advantages of re-using materials and machines that still possess a useful life.

In the case of IT industry, a company has to meet numerous standards to be a qualified supplier, manufacturer, or distributor. There are both public and private standards, though private standards are more dominant in this industry. Public standards, under rules and regulations, mainly concern public health, environment, consumer safety and safety at work place. The difficulty in complying with public standards lies in cross-border trade, when different economies have different public standards that companies are required to follow. Substantial resources are needed to ensure compliance with these public standards.

Security-related restrictions, cyber security, a secured business environment

Export restrictions of highly advanced equipment that has a dual purpose for both industrial as well as missile production complicates the importation of such equipment for use in manufacturing in some economies that are not signatories to the Missile Technology Control Regime (MTCR). The restriction, however, is not insurmountable under certain conditions such as providing reports if the equipment is moved from one location to another, or promising to ship back the equipment if it is no longer needed for industrial production. Presumably, the fact that the subsidiary that will use the equipment is fully owned by a company headquartered in the source economy also facilitates the easing of export restrictions.

Similarly, the need to trace the origin of raw materials to ensure that none of them comes from economies under sanctions imposes additional administrative burdens. Firms need to have advanced supply chain management systems to keep track of each and every component to ensure compliance and to avoid any potential penalties.

These restrictions are relatively benign compared to outright bans on telecommunications equipment because of an alleged potential cyber security threat. By invoking security exemptions, some governments prohibit the purchase of equipment for use in government-funded broadband networks from one of the case study firms based in China.

Though unrelated to terrorism, another form of ‘security’ threat is criminal activities that lead to the loss of cargo during transport, for example. In Mexico, delays in logistics are attributed by more than one-third of firms to the experience of criminal activities and solicitation of informal payments. Such security concerns add to the cost of logistics in the form of extra insurance and additional measures such as live tracking of trucks or the use of armed escorts (Wirjo and Pasadilla, 2015c).

1.5. Summary and Conclusion

This paper seeks to understand the importance of manufacturing-related services in different firms. Through face-to-face interviews, the study collected various experiences relating to services in different value chain configurations, as well as some policy restrictions that affect these services and the companies’ businesses in general. It finds that value chains use a wide range of services, numbering from as few as 37 and as many as 74. Moreover, 38 per cent to 90 per cent of services are outsourced to third parties, usually depending on cost considerations and on whether they form part of the core activity of the firm.

Policy issues discussed with firms included restrictions on investment and labor mobility, policies relating to skills development, a range of other regulatory issues, customs facilitation, and security-related threats. For the most part, the policy issues were not merely about services, but also highly relevant to manufacturing operations. This attests to the need to think about policies in terms of their overall impact on economies in world where manufacturing and the supply of services are increasingly co-dependent. The paper discusses the nature of restrictions in different economies, the costs they impose on firms and customers, and their general economic effects.

The policy discussions are also relevant to institutional and infrastructural development. Examples of positive experiences of economies that have liberalized port management and modernized ports and transport facilities show how this has minimized the distance disadvantage of some economies from their markets and fostered competitiveness. The paper has also brought out the need for effective intellectual property protection. Importantly, it highlights the effects of the policy incoherence inherent in opening up manufacturing for investments but maintaining restrictions on services.

Although perhaps a distant objective at the moment, providing visa waivers for more economies, facilitating labor mobility, and relaxing foreign labor quotas can lead to large benefits for the receiving economy (Kommerskollegium, 2015). Such policies are a strong complement to foreign investment openness and can support the transfer of technology and technical know-how.

Helping SMES with international standards accreditation would boost their ability to participate in GVCs. Standards and high conformity assessment costs, along with other institutional disadvantages, such as a lack of access to finance, are among the other hurdles confronting SMEs as they seek to reap the benefits of being part of GVCs.

In order to improve government services and to avoid creating negative impact on trade, it is also imperative to build and maintain constructive stakeholder relationships. This may include providing opportunities for public consultation in the regulatory process and constantly reviewing the regulations with stakeholder involvement. Such measures can contribute to enhancing transparency, predictability and consistency in the business environment and minimize the costs described in the various case studies.

Finally, the case studies illustrate how policies carrying unnecessary costs merit careful consideration in each economy's political and economic calculus as it crafts its vision and plans for generating growth, jobs and development.

Appendix A

Table A.1. Restrictions on foreign ownership for logistics sector

	a. Domestic transport service			
	Full foreign equity ownership ¹		Partial foreign equity ownership ²	
	Without conditions	With conditions ³	Without conditions	With conditions ³
China	✓		✓	
Chile		✓		
Indonesia			✓	
Malaysia		✓	✓	✓
Mexico			✓	✓
Peru			✓	✓
The Philippines			✓	
Russia	✓			
Thailand		✓	✓	
Viet Nam			✓	

Source: PSU compilation based on Japan External Trade Organization (JETRO) data.

¹ Full foreign equity ownerships in domestic transport service are allowed for: all sub-sectors (Chile and Russia); freight transport by road (China); some business operations (Thailand); transportation of goods held by a company (Malaysia).

² Partial foreign equity ownerships in domestic transport service are allowed for: all sub-sectors (Thailand); freight transport by railway (China); commercial vehicles licensing of freight transport and container transport (with conditions) and domestic shipping licensing (Malaysia); general cargo transport, domestic shipping business and freight forwarding business (Indonesia); companies that are considered as operating and managing public utilities (The Philippines); freight transport by land and sea (Viet Nam); domestic commercial air and marine transport (with conditions) (Peru); domestic air transport, air-taxi transport, and special air transport, port transport services such as towing, mooring and chartering, shipping companies engaged in marine operations of ocean transportation and provision of public railway services (with conditions) (Mexico).

³ Conditions vary between economies and can include obtaining approval from the Cabinet or relevant Ministry, meeting certain minimum capital/investment requirements, having its nationals or residents in the management, captain and/or crew.

	b. Warehouse service			
	Full foreign equity ownership ¹		Partial foreign equity ownership ²	
	Without conditions	With conditions ³	Without conditions	With conditions ³
China	✓		✓	
Chile		✓		
Indonesia			✓	
Malaysia	✓	✓		✓
Mexico	✓	✓		
Peru		✓		
The Philippines		✓	✓	
Thailand		✓	✓	
Viet Nam	✓			

Source: PSU compilation based on Japan External Trade Organization (JETRO) data.

¹ Full foreign equity ownerships in warehouse service are allowed for: all sub-sectors (Chile; Mexico (but there are conditions to be met if foreign share is more than 49% and investment exceeds US\$271 million); Peru; The Philippines; and Viet Nam); warehousing of international marine transport and freight transport by road (China); logistics centre (Thailand); non-bonded warehouse and private bonded warehouse operators (with conditions) (Malaysia).

² Partial foreign equity ownerships in warehouse service are allowed for: all sub-sectors (Indonesia and Thailand); warehousing of freight transport by air (China); ordinary warehouse operators (Malaysia); companies that are considered as operating and managing public utilities (The Philippines).

³ Conditions vary between economies and can include obtaining approval from the relevant commission or committee, meeting certain minimum capital/investment requirements, and/or utilization of latest technologies.

c. Customs clearance service				
	Full foreign equity ownership ¹		Partial foreign equity ownership ²	
	Without conditions	With conditions ³	Without conditions	With conditions ³
China	✓			
Chile		✓		
Indonesia			✓	
Malaysia				✓
Peru		✓		
The Philippines			✓	
Thailand			✓	
Viet Nam			✓	

Source: PSU compilation based on Japan External Trade Organization (JETRO) data.

¹ Full foreign equity ownerships in customs clearance service are allowed for: all sub-sectors (Chile and Peru); agents of international freight transport (China).

² Partial foreign equity ownerships in customs clearance service are allowed for: all sub-sectors (Indonesia; Malaysia; and Viet Nam); harbour cargo handling companies that are considered as operating and managing public utilities (The Philippines); customs service and freight forwarding business (Thailand).

³ Conditions vary between economies but generally include meeting certain minimum capital/investment requirements.

Table A.2. Restrictions on foreign ownership for retail services

Retail service				
	Full foreign equity ownership ¹		Partial foreign equity ownership ²	
	Without conditions	With conditions ³	Without conditions	With conditions ³
China	✓			
Chile		✓		
Indonesia		✓		
Malaysia				✓
Mexico	✓	✓		
Peru	✓			
The Philippines		✓		
Russia	✓			
Thailand		✓	✓	✓
Viet Nam		✓		

Source: PSU compilation based on Japan External Trade Organization (JETRO) data.

¹ Full foreign equity ownerships in retail service are allowed for: all sub-sectors (China; Chile; Mexico (but there are conditions to be met if foreign share is more than 49% and investment exceeds US\$271 million); Peru; The Philippines; Russia; Thailand; and Viet Nam); minimarkets, supermarkets and department stores (Indonesia).

² Partial foreign equity ownerships in retail service are allowed for: all sub-sectors but there are conditions to be met if more than 50% foreign equity are desired (Thailand); hypermarkets and supermarkets (Malaysia).

³ Conditions vary between economies and can include obtaining approval from the relevant committee or commission, meeting certain minimum capital/investment requirements, having certain minimum floor spaces, handling certain luxury goods, undertaking economic needs test for opening additional stores, and/or being members of certain preferential agreement/ FTA.

Table A.3. Restrictions on foreign ownership for wholesale services

	Wholesale service			
	Full foreign equity ownership ¹		Partial foreign equity ownership ²	
	Without conditions	With conditions ³	Without conditions	With conditions ³
China	✓			
Chile		✓		
Indonesia			✓	
Malaysia	✓	✓		
Mexico	✓	✓		
Peru	✓			
The Philippines	✓	✓	✓	
Russia	✓			
Thailand		✓	✓	✓
Viet Nam	✓			

Source: PSU compilation based on Japan External Trade Organization (JETRO) data.

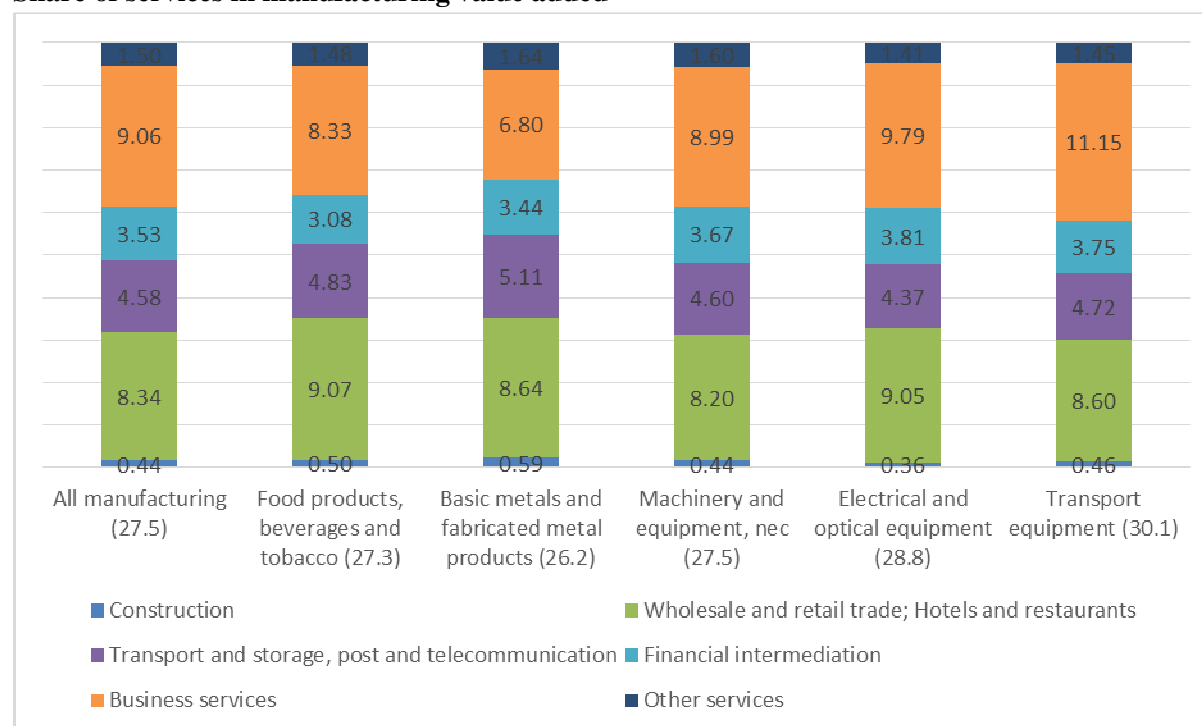
¹ Full foreign equity ownerships in wholesale service are allowed for: all sub-sectors (China; Chile; Malaysia (but require permission for importation and selling new completely assembled vehicles); Mexico (but there are conditions to be met if foreign share is more than 49% and investment exceeds US\$271 million); Peru; Russia; and Thailand); import-export businesses and domestic wholesale services (with conditions) (The Philippines); all except if materials handled are cigarettes, books, newspapers, magazines, video recording devices, precious metals, medicines and sugar (Viet Nam).

² Partial foreign equity ownerships in wholesale service are allowed for: all sub-sectors but there are conditions to be met if more than 50% foreign equity are desired (Thailand); distributor, warehouse and cold storage businesses (Indonesia); domestic wholesale services (The Philippines)

³ Conditions vary between economies and can include obtaining approval from the relevant Ministry or committee, meeting certain minimum capital requirements, and/or being members of certain preferential agreement/ FTA.

Appendix B

Share of services in manufacturing value added

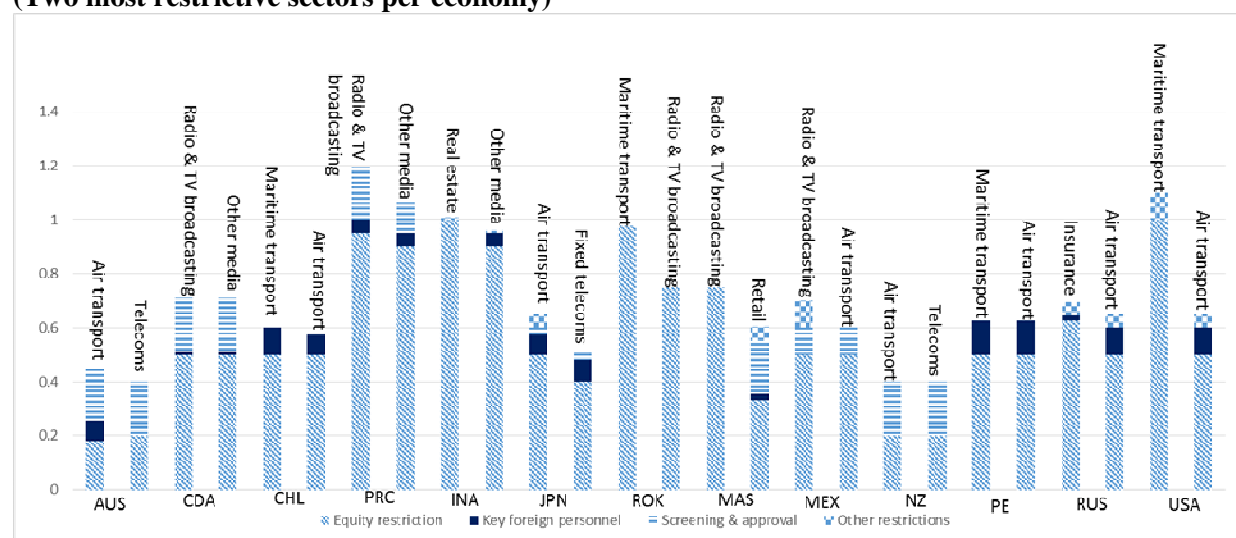


Note: Numbers at the bottom are shares of total services in the industry.

Source: Authors computation based on TiVA data.

Appendix C

FDI regulatory restrictiveness index (2014) (Two most restrictive sectors per economy)



Source: PSU computations based on OECD FDI Regulatory Restrictiveness Database

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