



GLOBAL VALUE CHAINS: CHALLENGES, OPPORTUNITIES, AND IMPLICATIONS FOR POLICY

OECD, WTO and World Bank Group

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FOREWORD

Meeting at the Saint Petersburg Summit in September 2013, the assembled leaders of the Group of Twenty noted “the importance of better understanding the rapid expansion of global value chains (GVCs) and impacts of participation in GVCs for growth, industrial structure, development and job creation.” Leaders welcomed the work done in 2013 by the OECD, the WTO, and the UNCTAD, and asked them “to seek the views of governments and continue their research on the impact of GVCs, particularly in relation to the influence of GVCs on trade, economic growth, development, job creation and distribution of value-added along GVCs.” Leaders also called on “the OECD in cooperation with the WTO and UNCTAD to deliver a report in the first half of 2014.” Subsequently, the OECD invited the World Bank Group to participate in this exercise. The present document, drawing upon the latest research, is submitted in fulfilment of that mandate.

The rise of GVCs has produced a new “trade-investment-services-know-how nexus,” or the intertwining of trade in intermediates, the movement of capital and ideas, and demand for services to coordinate the dispersed production and distribution of goods and services. As such, GVCs are becoming increasingly influential in determining future trade and FDI patterns, as well as growth opportunities. Policy needs to respond to this new reality and promote a business environment that not only makes a country attractive for location of GVCs, but also facilitates upgrading opportunities over time.

The analysis stresses that GVCs do not respond to piecemeal approaches to policy change. A “whole-of-the-supply-chain” approach is needed. Some of these policies are horizontal in nature: good infrastructure and connectivity, a business-friendly environment, flexible labour markets, access to credit, innovation and macroeconomic stability. Other policies are more targeted, such as tariffs and other trade restrictions, subsidies, local-content or export-performance requirements, and restrictions on foreign exchange. This report, together with discussions during the G20 Australian Presidency-OECD Stocktaking Seminar on GVCs that was held in Paris on 5 May 2014, highlights the following priority actions for G20 governments:

- Implement and ratify the WTO Trade Facilitation Agreement as quickly as possible. G20 governments should consider implementing TF measures – such as streamlining customs procedures – even before the ratification process is finalised at the WTO. Developed countries should provide support, where possible, to developing countries as they make trade facilitation commitments that require additional technical assistance.
- Improve services sector efficiencies, as services are the links that forge global value chains.
- Reinforce the standstill commitment against protectionism and wind back any restrictive measures implemented since the crisis – with a particular focus on non-tariff barriers.
- Address supply chain barriers, including where their removal would encourage participation by small and medium-sized enterprises.
- Ensure that preferential trade agreements create better business outcomes.
- Pursue active labour market policies and investments in education, skills and training – to better match labour supply with demand – and develop adequate social safety nets for those facing difficulties in adjustment.

It is important to stress that while open markets are crucial, alone they are insufficient. GVCs also need to be complemented with appropriate and wide-ranging policy frameworks that allow countries and firms to capitalize on their existing productive capacities and spillover benefits from foreign investment, knowledge,

and innovations. These include labour market policies, social policies and competition policies as well as policies for investment in education, skills, technology and strategic infrastructure.

The development dimension of GVCs will remain an important focus of our work as we move forward. GVCs offer an opportunity to integrate in the world economy at lower costs – but gains from GVC participation are not automatic. Benefits of GVCs can also vary considerably depending on whether a country operates at the high or at the low end of the value chain. This report is a further contribution to this discussion. To fully capture the effects and implications of GVCs for developing countries, it will nevertheless be important to continue and deepen our analysis to improve our understanding and help governments to harness the benefits. We look forward to continuing to update G20 Leaders on a timely basis.

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EXECUTIVE SUMMARY

The growth of global value chains (GVCs) has increased the interconnectedness of economies and led to a growing specialisation in specific activities and stages in value chains, rather than in entire industries. Over 70% of global trade is in intermediate goods and services and in capital goods. The income created within GVCs has doubled, on average, over the last 15 years; in China, income associated with GVCs has grown six-fold.

Not all firms and countries are equally involved in GVCs. Some countries participate in many, either as the host country to lead firms or as suppliers of very specific tasks, while others participate very little. These varying degrees of connectedness are determined by many considerations, some of which are fixed (such as a country's geographic location and resource endowment), while others can be shaped by public policy (such as a country's human capital, physical infrastructure, and overall investment climate). Here governments play a key role, as they may enact policies that either promote or reduce the capacities of their firms to enhance their competitiveness, attract investment, and insert themselves into GVCs.

No one field of public policy or firm behaviour can offer the “silver bullet” for a country or firm, as eliminating barriers in a single area may be insufficient to trigger investment or scaling up of existing activities if other policies or shortcomings continue to weigh the supply chain down with significant costs.

Horizontal policies with economy-wide effects, such as a stable economic and political environment, human capital development, and a national infrastructure of roads, ports and telecommunications systems have been widely embraced. Sector-specific support policies, by contrast, are often aimed at “picking winners,” tend to distort international competition and have not been very successful. In order to engage in specific GVCs, countries require policies that go beyond broad initiatives focused on fostering competitiveness and investments.

Our analysis highlights the following lessons for policy from successful integration into GVCs.

For trade...

- The way that trade policy is conceived requires adjustment; it is necessary to value imports as well as exports, to reduce time delays as well as tariffs, and to look “behind the border” at regulatory measures as well as “at the border” measures.
- While tariffs are no longer as important in most channels of trade as they once were, the structure of GVCs can multiply the effects of even low-level rates of duty.
- Multilateral market opening is preferred over discriminatory arrangements, as barriers between third countries, upstream or downstream, can matter as much as barriers put in place by direct trade partners.
- Trade facilitation helps countries participate in GVCs by cutting costs, avoiding unnecessary delays, and reducing uncertainty. The potential reduction in trade costs of fully implementing the WTO Agreement on Trade Facilitation is as high as 14% for some developing countries.
- GVCs are particularly sensitive to the quality and efficiency of services, accounting for 42% of the value-added in the exports of G20 economies and more than 50% for some countries.

- Improving logistics services, in particular, is essential to effective GVC participation. High-quality logistics affect trade even more than distance or transport costs; every extra day needed to ready goods for export and import could potentially reduce trade flows by up to 4%.
- International regulatory cooperation, including via mutual recognition agreements can help mitigate compliance costs that arise as a result of unnecessarily complex or heterogenous regulations, enhancing the ability of firms, in particular SMEs, to participate in GVCs.

For growth...

- Trade-related participation in GVCs contributes to economic growth through the gains that firms achieve from specialisation and improved productivity for both imports and exports (access to new technology and knowledge spill-overs).
- This is equally the case for investment, where the nature of the interaction between foreign firms and domestic producers can explain more of the potential productivity spill-overs than the level of FDI.
- Policies that aim artificially to increase the domestic content of exports do not have a good track record. Such policies can shift resources to less productive activities, prevent local producers from outsourcing and having access to the most efficient inputs, and discourage knowledge spillovers on both the import and export side. In this regard, policies targeted to increase competitiveness of local suppliers are likely to be more efficient.
- Integration into GVCs should be only one part of a broader, pro-growth agenda. A well-crafted package of macroeconomic and structural policies is also required to stimulate growth, and the precise shape of these policies depends significantly on the specific situation in a given country.
- Many less developed economies need to improve supply-side capacity through strategic investments in people (health, education, and skills) as well as in physical infrastructure.

For jobs...

- The remarkable increase in the value-added within GVCs as a share of world GDP means that a high share of employment now relies on foreign final demand and the smooth functioning of GVCs.
- Offshoring should not be viewed as a threat. The jobs potentially displaced by new trade and investment opening are dwarfed by the jobs already depending on the operations of established foreign affiliates and on exports of value-added in GVCs. Changes in the composition of jobs due to engagement in GVCs are best addressed by effective education and skills policies.
- The real risk for employment is the disruption of value chains, as was demonstrated in 2011 following the Tohoku earthquake and tsunami in Japan and later following flooding in Thailand. Policy needs to protect workers, not jobs, including against the loss of jobs as a consequence of trade policy reversals and “beggar thy neighbour” policies.
- An open investment regime is beneficial to the domestic economy, even when foreign affiliates of MNEs represent a very large share of exports. Recent OECD analysis highlights that more than half of the contribution of foreign affiliates to domestic value-added is through labour income that stays in the domestic economy.
- Differences across countries in the share of the gross operating surplus of foreign-owned firms leaving the host economy are often related to tax regimes and the tax strategies of firms. Current international efforts to address “base erosion and profit shifting” could reduce the share of the gross

operating surplus of foreign firms leaving some economies. In this situation, tax policy – not trade policy – is the appropriate response.

For development...

- Developing countries are increasingly involved in GVCs which offer an opportunity to integrate in the world economy at lower costs. But the gains from GVC participation are not automatic.
- Strong social, environmental, and governance frameworks and policies are important to maximising the positive impact of GVC activities and minimising risks in all countries, especially in developing economies.
- GVCs benefit from sound public institutions that enforce contracts, adequately secure property rights and investor protection, ensure an impartial judiciary, and reduce corruption.
- For firms to upgrade in GVCs, countries should develop an efficient innovation system that facilitates investments in knowledge, technology dissemination, skills upgrading and entrepreneurship.
- Financial system development can alleviate cash constraints and facilitate GVC participation. By lowering the cost of trade, well-functioning financial systems can increase the number of potential trading partners and the volume of trade.
- The role of services in GVCs highlights the importance of efficient services sectors in all countries, including developing countries. If established firms or potential new entrants cannot find the services supporting their activities in the local economy, they can be expected either to rely on cross-border provision (when feasible) or to establish in another country. This would slow development and growth.
- Countries should ensure that GVC participants observe international core labour standards, including establishment and enforcement of occupational health, safety, and environmental standards and related capacity-building for compliance.
- Policies that artificially increase the participation of firms in GVCs through direct government incentives for specific activities and disincentives for other activities will most probably not generate sustainable benefits. Linking with lead firms can be a more solid foundation to build on for many small and innovative firms.

Finally, it is important to stress that trade liberalisation is an important condition for generating inclusive employment and income growth from GVC, but is alone insufficient. Not all countries, firms and workers are equally prepared for the adjustments associated with more integrated markets. Though every country has its own specificities, it is still crucial to have active labour market policies and investments in education, skills and training – to better match labour supply with demand – as well as adequate social safety nets and competition policies in place. Investments in improving supply side capabilities will be needed in many developing countries, in addition to creating an overall policy environment conducive to innovation.

INTRODUCTION

The message that the 2013 OECD-WTO-UNCTAD report to G20 Leaders, *Implications of Global Value Chains for Trade, Investment, Development and Jobs* had for the G20 Leaders was clear: Global value chains reflect 21st century production and provide potential mechanisms for countries – large and small, developed and developing – to improve income, employment, and productivity. Open markets are crucial, but alone they are insufficient; GVCs also need to be complemented with appropriate policy frameworks that allow countries and firms to capitalize on their existing productive capacities and spillover benefits from foreign investment, knowledge, and innovations.

The report noted that trade policy needs to reflect this new reality, and in particular the growing international interdependencies, that are driven by the increasing fragmentation of production. It highlighted the key role played by other forms of market access, in particular investment, and the importance of complementary policies to leverage gains from investment. Further, the report noted that environmental, social, and governance frameworks are needed if GVCs are to create strong development benefits. Strengthened regulation, enforcement, and capacity-building support to local firms for compliance can be important.

One of the outstanding challenges is to understand better the obstacles to participation in GVCs, particularly in some developing economies and for firms of various sizes and structures. The changing nature of international competition via GVCs will entail adjustment costs, as some activities grow and others decline, and as activities are relocated across countries and a wide range of policies cutting across the labour market, social and competition policies right through to investment in education, skills, technology and strategic infrastructure will be needed to facilitate the adjustment process.

This report addresses these issues by exploring the theory and practice of GVCs. It is structured in three parts. The first part introduces the topic in greater depth, reviewing the place of these value chains in the new global economy and introducing the debates over the relationships between GVCs and trade, services, and development. The second part examines the elements of national and international policy that either facilitate or impede the participation of firms and economies in GVCs, including international agreements and national policies in such diverse areas as trade, investment, services, education, and infrastructure. The third and concluding section reviews the domestic and international agendas to improve the performance of GVCs, including best practices within and between countries.

Global value chains (GVCs) have become a dominant feature of the world economy, involving countries at all levels of development, from the poorest to the most advanced. The revolutions in information and communications technology (ICT), coupled with the development of ever more complex goods and production processes, have allowed firms to establish chains that are as intricate as they are efficient. That development has, in turn, obliged policymakers to take a more holistic approach to trade and investment policies.

The benefits from participation in GVCs are manifold. They provide scope for firms to enter markets by specialising in niche intermediate activities within a chain and allow suppliers to upgrade production into higher-value segments of their industries, learn new processes, meet standards that enhance their access to markets, facilitate exports and imports in intra-firm trade, encourage the utilisation of network technology, and tap into new sources of capital. At the national level, GVCs enable countries to specialise in areas of comparative advantage, thus enhancing productivity growth and supporting wages and incomes. At the same time, it has led to a growing interdependency and interconnectedness of economies.

GVCs oblige policymakers to deal with more complex issues than had been the case for conventional merchandise trade. They are part of a new global economy in which connectedness matters more, and in which ideas count as much as physical inputs. A successful venture now requires not just competitive costs and market access, but also knowledge of foreign markets, high levels of quality and reliability, and the achievement of global standards. This puts new competitive pressure on governments to adopt reforms that enable their producers to find niches in which they may make the most of their capabilities. It is to that last point that this report is devoted, identifying some best practices for governments that want to allow firms to make the most of the new opportunities.

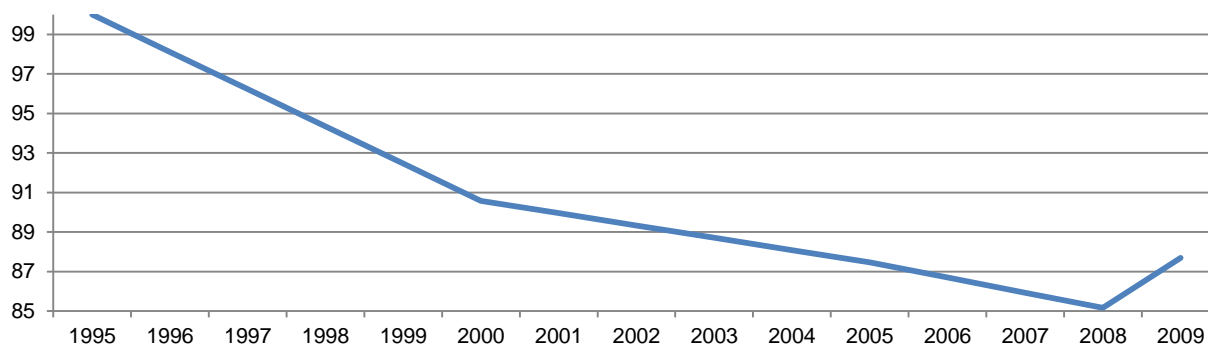
PART I.

HOW GVCs TRANSFORM THE NATURE OF TRADE AND TRADE POLICY

The spread of GVCs has been enabled by technological advances that reduce trade and co-ordination costs. The container ship or the jet engine, for example, decrease transport costs and facilitate the movement of goods and people. The development of ICT has also been an important driver in the emergence of GVCs as the co-ordination of activities across countries also involves high costs for companies. Such costs were substantially reduced with the Internet and reliable communication infrastructures. This increasing international fragmentation of production has produced a new “trade-investment-services-know-how nexus,” or the intertwining of trade in intermediates, the movement of capital and ideas, and demand for services to coordinate the dispersed production and distribution of goods and services. Key to this nexus are infrastructure and business services such as telecommunications, including the Internet, transportation, finance, trade facilitation, and knowledge-based services.

Successive rounds of trade liberalisation for goods and services, together with international investment arrangements, have facilitated the growth of GVCs. Specific deals, such as the Information Technology Agreement, also supported the spread of ICT. Figure 1 provides a broad measure of trade costs encompassing both policy and non-policy related costs, and highlights that between 1995 and 2009 these costs have been significantly reduced in G20 economies.

Figure 1. Average bilateral trade costs for goods and services, 1995 - 2009



Trade-weighted average for G20 countries based on years 1995, 2000, 2005, 2008 and 2009. Bilateral trade costs are indirectly inferred from observable trade data.

Source: OECD Inter-Country Input-Output tables.

That trend towards lower trade costs is only partly the result of negotiations. Trade policy as it was most traditionally defined, consisting principally of tariffs and other border measures intended to tax and regulate the importation of goods, has relatively less influence over the forging of value chains than it did during the heyday of protectionism or the later era of the General Agreement on Tariffs and Trade (GATT), although in some sectors such as agriculture they are still a major factor. Even with the expanding scope in the definition of trade policy, which has come to encompass many more topics affecting the transnational movement of goods, services, capital, people and ideas, trade laws and agreements form only a part of the policy mix that affects firms’ decisions on how to disaggregate their chains of production. Actual experience and studies place

a greater emphasis on domestic measures taken to enhance countries' production capacities and attractiveness to foreign investors, especially with respect to education and the upgrading of skills. Trade liberalisation may thus be important, but it is only one ingredient among many others. A trade agreement by itself cannot put a given country on the right path, regardless of its ambitions or content; this can be achieved only by the country itself, acting on an understanding of what must be done and the political will to do it.¹

GVCs reinforce the arguments against the already discredited mercantilist conception of trade, especially a zero-sum obsession with minimizing imports and expanding export opportunities. Imports are essential for exports, especially in complex value chains such as transport and electronics. Tariffs and non-tariff barriers in the presence of GVCs are effectively a tax on exports, and the negative effects of trade protection are compounded in GVCs when parts and components cross borders many times. GVCs thus make policymakers recalculate the costs that they impose on their own economies through protectionism.

Goods may cross borders many times in the process by which raw materials are transformed into finished products, and efficient customs and port procedures are indispensable to the operation of supply chains. A firm that aspires to global competition needs to be able to engage in just-in-time delivery, and to have the flexibility to respond quickly to demand. Tariffs still matter, especially if supply chains cross multiple borders and duties pile one upon the other, but tariffs also tend to be low, declining, and — perhaps most important — transparent and predictable. By contrast, unpredictable delays at the border can be far more costly. A country that not only permits but promotes quick and reliable movement of inputs, and is indifferent as to whether they are being imported or exported, is more attractive to potential investors who seek to outsource their production processes. These costs of protection may be even greater for services. Whereas producers of goods in a protected economy may use instruments such as *maquila* operations and duty drawbacks to undo the protective barriers to their imported inputs, comparable instruments are generally not available to ameliorate protectionist restrictions on the cross-border movement of services.

Countries increasingly rely on foreign inputs for their own firm exports, which may then be further processed in partner countries. The GVC participation index in Figure 2 captures these two dimensions. Between 30% and 60% of G20 countries' exports consist of intermediate inputs traded within GVCs. Comparing 2009 with 1995, the index shows increases in almost all G20 economies, and particularly in China, India, Japan, and Korea.

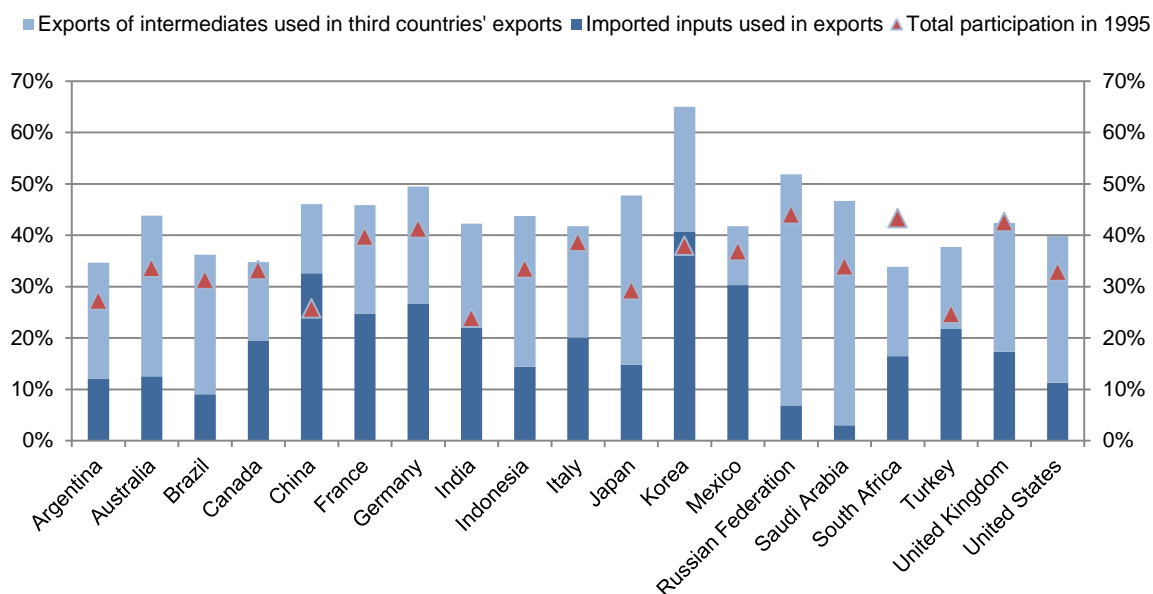
The participation index also reveals the regional dimension of value chain activities. For example; 13% of the total value of China's exports originates from neighbouring Asian countries; Mexico relies on 13% value-added from the United States and Germany sources 14% of its total value-added in exports from neighbouring European Countries.

Nevertheless, the global element is still important. Germany, for example, is a strong supplier of value-added to many countries outside of the European Union (such as Turkey, South Africa, China or Korea) as is the United States which supplies a significant (where the cut-off chosen is over 1.5%) share of the value-added to the exports of all countries except Russia. These countries, which can be seen to transcend regional boundaries or which are seen to coordinate regional production can be thought of as “headquarter” economies whereas those that use rather than sell their value-added can be likened to “factory” economies (Baldwin and Lopez-Gonzalez, 2013).

A significant heterogeneity is also apparent in the share of domestic value-added embodied in exports. For example, natural resource rich countries such as Australia, Russia and those in South America tend to have higher (lower) domestic (foreign) value-added in their exports. But so do economies such as the United States and Japan since they can draw on larger domestic markets for their intermediates and engage in more technologically advanced activities. In contrast, smaller countries and “factory” economies tend to exhibit lower domestic content of exports: 69% and 63% of the value-added in exports is domestic in, respectively, the rest of European Union and the rest of Asia groupings.

1. See Marconini, M. (2006).

Figure 2. GVC participation, 1995 and 2009



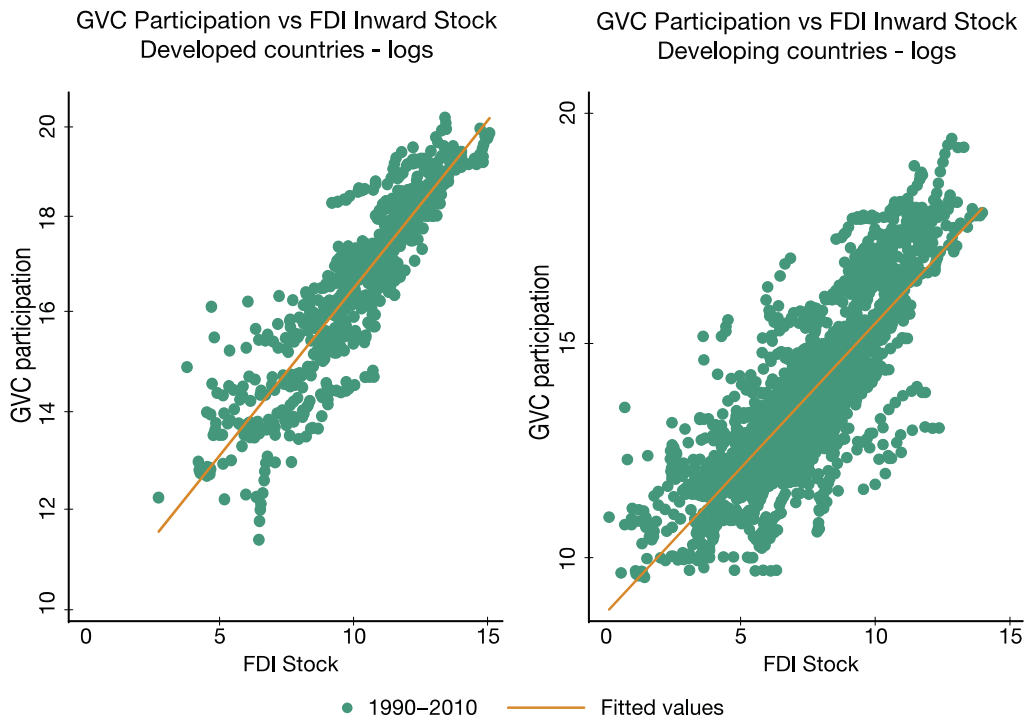
The index is calculated as a percentage of gross exports and has two components: the import content of exports and the exports of intermediate inputs (goods and services) used in third countries' exports.
Source: OECD (2013a).

The expansion of the operations of multinational enterprises (MNEs) as a business strategy (model) through foreign direct investment (FDI) has been a major driver of growth of GVCs, as illustrated by the close correlation between FDI stocks in countries and their GVCs participation index (Figure 3). The presence of foreign affiliates is clearly an important factor influencing both imported contents in exports and participation in international production networks.²

There are risks and costs associated with GVC participation. The growth of GVCs may mean accepting a progressive reduction in the domestic content of many countries' gross exports. Sourcing abroad also allows firms to make production less labour-intensive in the home country. This is a point that can sometimes cause anxiety, as employment in a capital-intensive economy will generally fall for any given level of output. Studies nonetheless show that the additional hiring due to improved competitiveness and higher sales may offset the job losses due to the fall in labour intensity.³ Other risks include getting locked into particular segments, and the pressures to reduce costs can lead to poor environmental, occupational safety and health standards, fluctuating or unstable demand for labour reinforced along value chains, and a race to the bottom of regulations and taxation policies. These concerns require that policymakers balance economic and other objectives, as discussed at greater length later in this report.

2. UNCTAD (2013).

3. See, for example, Hijzen and Swaim (2007).

Figure 3. FDI and GVC participation, developed and developing countries, 1990-2010

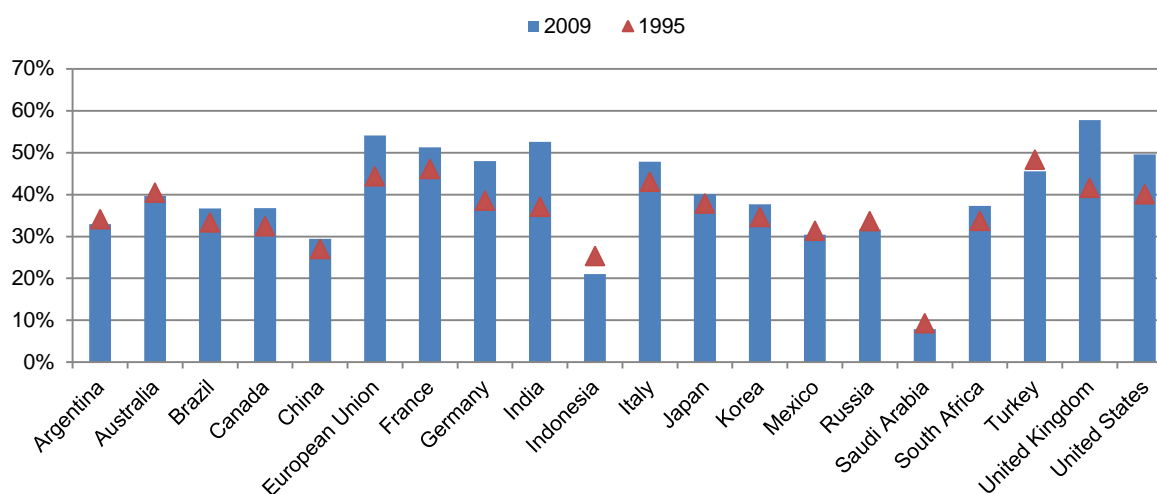
GVCs and trade in services

It is impossible to discuss GVCs without acknowledging the importance of services. The progression of the debate over services in the global economy has moved from one long period in which most services were dismissed as being “untraded” or “invisible,” to a few decades in which they were widely seen as mattering solely to developed countries (which might more accurately be deemed post-industrial economies), to the current realisation that the dividing line between goods and services is increasingly difficult to draw. Analysts are discovering that the services content incorporated in goods is not only large but rising. They are coming to appreciate how goods and services are blending together, a process that some call “servitization,” “servicification,” or the “manuservice” economy.⁴

Analysts and policymakers are increasingly aware of the pervasive importance of services both as tradable in and of themselves, as well as their integral contribution to production and trade in goods. For a long time, trade in services was seen as contributing only about one-fifth of world trade. The value-added data instead show that many services are embodied in the production of goods that are then exported, and hence the services content of goods trade is much higher when accounting for all the value-added originating in the services sector (Figure 4). The average services content of exports for G20 economies is 42% in 2009, and was at or above 50% for countries such as the United States, the United Kingdom, India, France, and the European Union as a whole.

4. See Ryu et al. (2012), Kommerskollegium (2010a), and Bryson and Daniels (2010).

Figure 4. Services value-added in gross exports (%)



Source: OECD/WTO TiVA database, May 2013 release.

Services are used throughout the value chain to upgrade the quality of products, lower costs, and enhance efficiency. The provision of services by manufacturers allows them to differentiate and customize goods. This link, called “servitization,” takes forms as diverse as farm equipment manufacturers who build in GPS capabilities to assist farmers, manufacturers of aircraft engines who monitor engine thrust and other parameters to assist in post-sales service, and car makers who provide such services as roadside assistance and satellite radio through IT-enabled vehicles. In one case study, the Swedish machine tool firm Sandvik Tooling makes use of over 40 different types of services in the various stages of producing, developing, and marketing its product, accounting for about half of the services covered in the GATS. In addition, Sandvik supplies about 15 different types of services itself.⁵ There is a close relationship between services and intangible assets, which enhance productivity without taking the form of physical capital.⁶ In one case study, only 9% of the value of a USD 450 men’s suit jacket made in China and exported to the United States can be traced to direct manufacturing costs. The other 91% consists of various services, intellectual property, profits, and other “invisibles” that are difficult to quantify.⁷

Services are also linked to agriculture throughout different stages of the value chains, such as agriculture-extension services and rental of equipment at production stage, as well as packaging, warehousing and marketing in the distribution stage.

GVCs for goods and services also differ in their actual and potential magnitudes. On the one hand, GVCs are currently less developed for services than for manufactures. According to the *World Investment Report 2013*, in 2010 the global average share of foreign value-added in exports in the tertiary sector (14.2%) was less than half the level of the secondary sector (29.4%).⁸ The average was lower still in the primary sector, at just 9.6%. On the other hand, the prospects for services growth here may be greater. While price increases for fuels and raw materials may raise the costs of establishing far-flung value chains in goods, just the opposite may occur for the services segments of these chains. There the continued decline in the costs of

5. Kommerskollegium (2010b).

6. Corrado, Hulten, and Sichel (2005).

7. Low (2013).

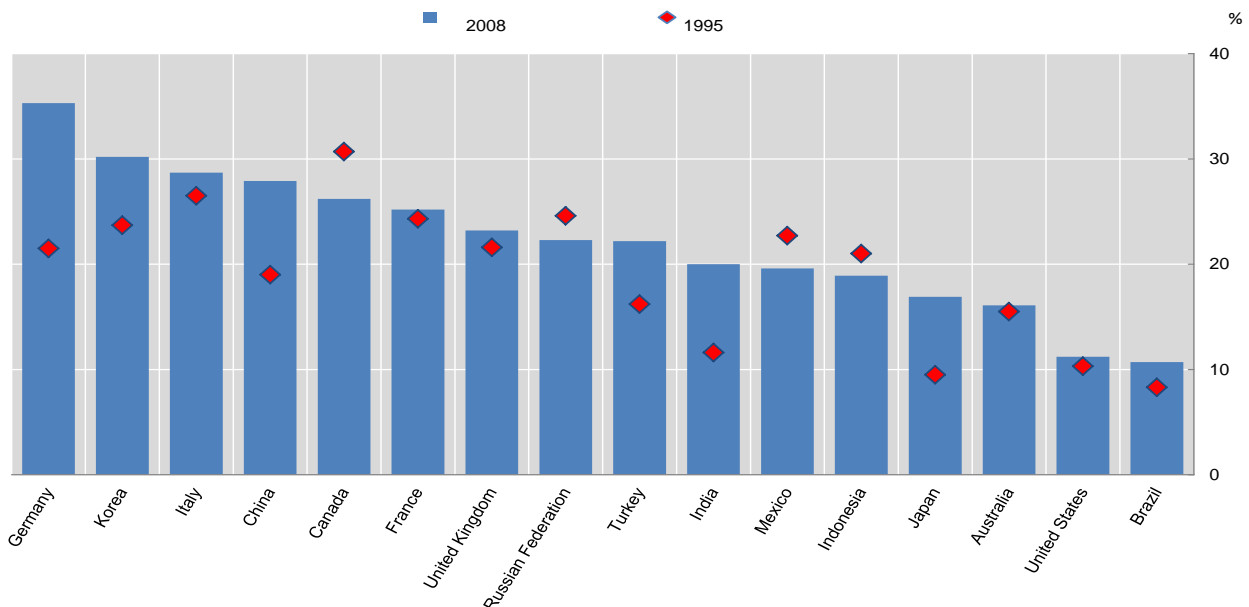
8. UNCTAD (2013).

computing and communications, coupled with the upgrading of skills in developing countries, make it even more attractive for producers to off-shore services components in their supply chains.

GVCs, jobs and wages

The world of work is becoming increasingly internationalised. OECD estimates suggest that in 2008, between 10% and 35% of business sector workers in G20 countries were engaged in export activities (Figure 5). Compared to 1995, these shares increased in most countries; in Germany it rose more than 10 percentage points – China, India, and Japan also posted strong increases. By 2008, over 25% of business sector workers in China were engaged in export activities. These shares are smaller in Japan and the United States owing to their relatively large size and lower dependency on international trade. Nonetheless, estimates for 2008 suggest that over 10 million US business sector workers were engaged in export activities, including towards emerging markets. The increasing internationalisation of labour markets implies that labour market policies and institutions can no longer be designed in isolation but have to take account of the broader international context. A second implication may be that the increased internationalisation of production increases job reallocation and, as a result, makes workers more vulnerable to shocks as was, for example, discussed in the *OECD Employment Outlook 2007* and Hijzen and Swaim (2007). It is also important that the gains associated with the fragmentation of production are fairly distributed. Recent trends in the share of labour in national income and the share of top incomes suggest that this may not always be the case, although there are many other factors that have also contributed to these trends. In-work benefits combined with moderate minimum wages can be used to shore up the incomes of low-skill workers. However, skill development opportunities for low-educated workers are also required to improve longer-term career prospects.

Figure 5. Jobs in the business sector sustained by foreign final demand, 1995 and 2008



Source: OECD Science, Technology and Industry Scoreboard 2013, based on OECD *Inter-Country Input-Output/Trade-in-Value-Added (ICIO/TiVA)* database.

GVCs and developing countries

GVCs are especially important for developing countries, for which the best metaphor would not be a chain but a ladder. The disaggregation of production into separate stages allows their firms not only to find their place on the ladder, but to move up the rungs as their capabilities improve. GVCs encourage that upward movement by rewarding skills, learning, and innovation. Overcoming obstacles to GVC participation can pay big dividends; developing economies with the fastest growing GVC participation have GDP per capita growth rates 2% above average.

Some developing countries have benefited not just from the foreign investments in the production of goods and services, but increasingly in more advanced operations such as research, design, and innovation. These higher value-added investments have mostly benefited countries with a certain degree of local knowledge capacities and large domestic markets (e.g. China and India). These countries are highly attractive as both platforms and markets, where the growing skills of an emerging middle class coincide with the rising incomes of those same producers and consumers. Some small economies have also managed to benefit from the new forms of organisation of production, thanks to strong framework conditions, sometimes combined with attractive incentive packages and a good skills base. That is the case in Costa Rica, for example, which has gradually gained ground as a location for high-end manufacturing in small-scale, high value-added production (e.g. medical devices). This growing integration of some developing countries into GVCs has been the result of a concurrence of factors, including new business strategies in the home and in the hosting countries, targeted policies to promote integration and internationalisation and new forms of public-private partnerships (OECD, 2013b).

Emerging economies are delocalizing certain production phases as firms search for lower wages. The displacement of textiles from China to Viet Nam, for example, or the shifts of manufacturing activities within China are creating opportunities in new territories. Those changes have opened up opportunities for learning that were not previously available. Some developing countries have benefited from increasing participation in international production networks through, among others, movement of new technologies and know-how; others have ramped up the density of their production structure, and some have done both.

Notwithstanding the above, not all developing countries have been able to benefit to the same extent from GVC participation, particularly lower income countries and those more distant from international markets. This remains an important area for our further research and analysis.

What determines countries' GVC engagement? Evidence from the OECD-WTO TiVA data

A forthcoming report by the OECD (OECD, 2014a) builds on the OECD-WTO Trade in Value-Added (TiVA) data and empirically links some of the key measures of GVC participation to a number of country-specific structural and policy indicators. The focus of this empirical exercise is on understanding the differences in the extent of export-related sourcing of foreign value-added (backward linkages) as well as on providing value-added to foreign producers for their exports (forward linkages).

The results suggest that structural and policy characteristics of countries can account for a significant part of the variation in the extent of GVC integration, particularly when it comes to backward integration. The lower degree of explanation by these characteristics of the forward engagement likely reflects the fact that this type of engagement captures the supply side of value chains and covers a diverse range of idiosyncratic activities extending from the supply of natural resources (by countries such as Russia or Australia) through high tech intermediate inputs (Germany and Japan) to specialised services (the United Kingdom and the

United States). In contrast, the backward engagement captures the demand side of value chains which is more closely linked to general characteristics of countries such as market size or degree of industrialisation.⁹

Overall, a number of structural and geographical factors, which are beyond the reach of policy at least in the short to medium term, belong to some of the key factors that explain countries' GVC participation. Yet, the relationships between these factors and backward and forward engagement are diverse. For example, we find that:

- The larger the size of the domestic market, the lower the backward engagement of a country, and the higher the forward engagement. The intuition is that countries with a larger market can draw on a larger array of intermediates both in terms of purchases and sales.
- The higher the per capita income the higher the forward engagement while the relationship with backward engagement is insignificant. Developed countries tend to sell a higher share of their gross exports as intermediate products.
- The higher the share of the manufacturing sector in GDP the higher the backward engagement, and the lower the forward engagement.
- The larger the distance to the main manufacturing hubs in Europe, North America and Asia, the lower the backward engagement while the impact on forward engagement is insignificant, suggesting that there is a premium to locating close to large “headquarter” economies.¹⁰

These results also show a certain potential for commercial and other policies to contribute to GVC integration. Low import tariffs, both at home and faced in export markets, and engagement in regional trade agreements (RTAs) can all facilitate backward and forward GVC. Openness to inward FDI tends to have a more significant association with both the backward and forward integration, albeit the impacts go in different directions. We find that the higher the ratio of the inward stock of FDI to GDP, the higher the backward engagement, and the lower the forward engagement. This suggests that inward FDI tends to be associated more with importing of foreign value-added for exports than with exporting the domestic value-added for export processing abroad.

The analysis shows also that structural and policy drivers and GVC participation tend to vary substantially by sector. For example, compared to manufacturing, the market size plays much less of a role when it comes to explaining the extent of backward integration in the agricultural and mining and extractive sectors, while the level of development plays a larger role, reflecting the difference between resource rich and more industrialised economies. On the other hand, the revealed openness to FDI has a more pronounced impact on backward integration in mining and extractive industries and services as compared to manufacturing. Not surprisingly, the negative relationship between import tariffs and GVC integration is much more pronounced in manufacturing than in agriculture or mining and extractive industries.

9. For example, while all countries with a sufficiently developed industrial sector will need an input of iron ore to produce steel or steel products (backward linkage), not all countries will be endowed with iron ore deposits that they can export (forward linkage).

10. UNCTAD also identifies transport costs and transport connectivity as a direct hindrance to trade and participation in GVCs.

PART II.

ELEMENTS THAT FACILITATE OR IMPEDE PARTICIPATION IN GVCs

Not all firms and countries are equally involved in GVCs. Some countries participate in many and varied GVCs, either as the host country to lead firms or as supplier of very specific tasks, while others have experienced little penetration. These varying degrees of connectedness are not determined solely by a country's openness to trade, but a diverse array of considerations. Some of these factors are permanent and not subject to change by government fiat, such as a country's geographic location and its endowment of natural resources, while others can be shaped by the laws and policies that a country enacts, the international agreements into which it enters, and the investments that it makes. These include the modernity of the infrastructure, the skills of its workforce, and – perhaps most important of all – the friendliness of the business climate and the capacity of public administrations to mobilise and coordinate with business and labour organisations. Nor are governments the only actors that determine the extent of their countries' connectedness to value chains. These connections are ultimately made by firms, and those firms can differ greatly in their willingness and ability to link up with local and international partners. Indeed, the distribution of power among various forms of GVCs is reflected in the different organizational structures of these chains. These structures are summarized in Box 1.

The principal role of governments is not to create, subsidize, or tax GVCs, nor to regulate them more than is necessary to maintain desired standards of social and environmental protection. Instead, governments should foster environments that are friendly to production, investment, transportation, communication, and trade, allowing firms to take fullest advantage of their own skills and those of their business partners. In addition to competent, transparent, and honest public governance, key elements of a welcoming business environment include macroeconomic stability, access to finance, and the overall ease of doing business.

Borders still matter, but the old instruments of trade policy are now less significant than inefficient border procedures, non-tariff barriers that unnecessarily constrain goods or services trade, restrictions on the flow of information, and impediments to foreign direct investment and limits on the movement of people. Countries that neglect these considerations pay a “competitiveness penalty” in global markets, and the cost of that penalty cannot be easily undone by low tariff rates. The challenge for developing countries that seek to make the most of GVCs is to design and implement broad strategies that tackle these key barriers to integration and upgrading of their firms in GVCs.

The diversity and capacities of firms

GVCs are first and foremost the creation of private firms, but those firms differ greatly in their propensities for partnership and in their success at integrating themselves in the modern international economy. Distinctions can be drawn among firms not just along well-established lines such as the type of industries in which they are engaged or the manner in which they are organized, but also in their different national headquarters, their varying scales of operation, and their distinct places within GVC hierarchies. The term “firm” encompasses a wide spectrum that ranges from small and medium enterprises (SMEs) whose employees can be counted on as few as two hands to multinational enterprises (MNEs) that may be economically larger than some of the host countries in which they operate. GVCs have hierarchies of their own, in which lead firms play different roles than their smaller partners. No matter what their origin, size, or role, however, most firms that engage successfully in GVCs share at least a few characteristics in common. These start with competitiveness in one or more tasks, a perspective that extends beyond their national markets, and a willingness to join up with other firms that have this same outlook.

Box 1. “Buyer-Supplier” relational linkage strength of global supply chains			
	←	→	
	(Weak)		(Strong)
	Market-based arm’s length relationship	“Sticky” relationship	Vertical integration
Ownership structure	Lead firm (buyer) does not own any of the suppliers	Lead firm (buyer) maintain some degree of relational linkage with suppliers	Lead firm (maker) directly or indirectly owns suppliers
Industry characteristics	Low-tech requirement, labour-intensive, low design specification	Low-tech requirement, labour-intensive, high design specification	High-tech requirement and design specification, labour intensive or capital-intensive
	Economy of scale	Economy of scope	Economy of scale and scope
Product sectors	Consumer non-durables	Consumer non-durables	Consumer durables
Product characteristics	Standard, non-differentiated products (e.g. standard apparel, electronics, toys), long or short life cycle	Design- or process- or other requirement-specific products (e.g. designer-apparel, footwear, electronics) short life cycle	Quality-sensitive (e.g. auto parts and components, assembly), long life cycle
Buyer characteristics	Mega (low-price) retailers	Brand owners	Makers
	International buyers (i.e. triangular production network)	International buyers (i.e. triangular production network)	Brand owners
Supplier location	Low-income developing countries	Low or middle-income developing countries	Middle- or higher-income developing countries
Buyer-supplier transfer of technology	Unlikely	Likely	Necessary

UNCTAD (2013) adapted from: Kaplinsky (2005) and Milberg (2004).

The market-based arm’s length buyer-supplier linkage is common in the industries whose manufacturing requires low-tech, labour-intensive standard techniques and where products are standardized. As production and process requirements increase, or as final products become more differentiated, buyers, or the lead firms’ chain management needs increase as well, thus the buyer-supplier linkage tends to become stronger. In general, the trend observed is that there are more low-income countries among low-cost suppliers of non-differentiated products, and higher- to middle-income developing countries as suppliers of more differentiated products.

The co-ordination of GVCs is generally the province of large multinational enterprises (MNEs), whether they be brand-name designers of products (e.g. Apple in electronics), retailers (e.g. Walmart), or middlemen and facilitators (e.g. Li and Fung in apparel). These lead firms largely determine the location of high-value activities and the conditions under which other firms participate in GVCs. The characteristics of lead firms, including economic strategies and management style, affect the upgrading opportunities offered by GVC participation. GVCs were once principally dominated by US, European, and Japanese lead firms, but the growth of emerging economies and increased South-South trade has given rise to a new generation of lead firms headquartered in Africa, Latin America, and especially Asia. Thus, while traditional lead firms continue to influence the geographic scope of GVCs, rapidly growing lead firms and global suppliers from the developing world are becoming powerful actors in shaping GVC strategies and requirements for access, integration, and upgrading.

The most typical path for SME entry into GVCs is to sell their goods and services to larger, multinational firms. In 2007, SMEs in the United States accounted for 28% of US direct exports, but because

they also sold to larger firms that export (i.e. engaged in indirect exporting), they actually accounted for 41% of US value-added through exporting. Such indirect exporting alone supported an estimated 2.1 million jobs.¹¹ The insertion of SMEs into GVCs is especially important in the developing world, where these firms represent approximately 80-90% of total employment. In ASEAN, the share of SMEs participating in global production networks, both as direct and indirect exporters, varies from 6.3% in Indonesia to 46.2% in neighbouring Malaysia.¹² The ability of SMEs to participate in GVCs can yield substantial benefits, including spill-overs of production technology and managerial know-how. SME development policies, including supplier-development programs and other forms of collaboration with foreign-invested firms, can promote such positive linkages.¹³

While the opportunities for SMEs can be large, so too are the barriers that they must overcome. Domestic firms typically confront important challenges that limit their participation in GVCs, some of which are imposed by governments (e.g. compliance with the multitude of regulatory standards) and others of which are set by lead firm (e.g. cost, lead-time, and batch size). The ability of domestic firms to take advantage of these opportunities are limited by such shortcomings as poorly functioning financial markets, inefficient infrastructure, limited human capital, and weak local industry networks.¹⁴ Firms in developing countries can nevertheless acquire capabilities within niche activities that are characterised by low capital-intensity. The opportunities for local firms to increase productivity and upgrade to higher value-added activities depend not only on the type of GVCs in which they operate, but also on the business and institutional environment in the economy and on their capacity to move towards increased technological sophistication and domestic value-added creation. Regardless of a firm's position in the value chain, minimum quality, cost, and reliability requirements must be consistently met in order to participate on an on-going basis, and buyers' sourcing strategies are constantly revised to improve these elements of their supply chains.

The ability to comply with international standards is an especially important constraint on firms that have heretofore been strictly domestic. Standards are often lower in emerging markets for a number of reasons: public institutions have not sufficiently developed to put in place rigorous health and safety standards; consumers are less educated, demanding less differentiated products and thus easing private standards; and civil society is often less active, reducing the role of environmental and social requirements. However, global markets tend to have stronger standards at the public, private, and civil society levels, so standards compliance has become a pre-requisite for entry in GVCs serving these markets.

If firms can breach these barriers, companies with widely varying sizes and differing global footprints can produce synergistic relationships. Each partner can play to its strengths, and also help the others to overcome their weaknesses. By collaborating with SMEs, lead firms can acquire flexibilities they might not otherwise enjoy. Large firms, as well as governments, that commit to paying invoices to SMEs in a timely manner can help smaller firms overcome their endemic credit constraints. Similarly, large firms that assist SMEs with standards and certification issues can facilitate SMEs' participation in GVCs. These relationships can produce virtuous cycles in which the smaller partner acquires capabilities that allow it not just to offer increasingly important services to the GVC, but also to engage in GVCs with other partners or to service better its domestic client base.

11. USITC (2010). Here SMEs are defined as firms with less than 500 employees.

12. Wignaraja (2013). Here SMEs are defined as firms with less than 100 employees.

13. Farole and Winkler (2014).

14. Bamber et al. (2013).

New SMEs are created every day and some of these can be highly innovative and have an ability to engage in GVCs. Improving the conditions for entrepreneurship and the growth of young firms, e.g. through improvements in regulatory frameworks, can play an important complementary role in diversifying the engagement of countries in GVCs. Moreover, young firms are the main driver of job creation.

Firms that join GVCs can find themselves in a stronger position to upgrade their skills. That upgrading takes a variety of forms. One is *functional upgrading*, which occurs when firms acquire capabilities to provide competitive products or services in new segments or activities of a GVC that are associated with higher value-added. Another is *process upgrading*, the phenomenon by which firms acquire capabilities to process tasks with significantly higher efficiency, lower defect rates, and process more complex orders than rivals. *Product upgrading* is realised when firms acquire capabilities to supply higher value-added products compared with those by rivals through superior technological sophistication and quality. It also involves the capability to introduce novel products faster than rivals. That is to be distinguished from *chain upgrading*, which is realised when firms acquire capabilities, often leveraging the knowledge and skill acquired in the current chain, to participate in new GVCs producing higher value-added products or services. These distinctions aside, the key point remains that initial entry into GVCs, and a firm's further rise within them, require that enterprises acquire and constantly improve their edge over the competition.

Government policies that promote or retard competitiveness

The capacity of firms to meet the requirements of GVCs is affected by the institutional context in which they operate. Here governments play a key role, as they may enact policies that either promote or reduce the capacities of their firms to enhance their competitiveness, attract investment, and insert themselves into GVCs. Good governance in general is important, as it signals to prospective investors and traders that a country is a good place to invest their capital.

GVCs, like the larger global economy of which they form a part, are affected by a diverse array of policies. That may be appreciated from the typology given in Table 1, summarising both the characteristics of firms and the fields of public policy that affect a country's competitiveness in GVCs. While some of these considerations may at first seem to be wholly within the province of the firms themselves, such as the quality of their human capital, all of them are affected – directly or indirectly, immediately or over the long term – by the actions of governments. Those include some policies that are deliberately designed to affect trade and investment, as well as others that affect competitiveness in subtler ways.

Table 1. Firm characteristics and fields of public policy that affect competitiveness in GVCs

Productive capacity	Human capital	The cost and availability of labour is essential for lower-value labour-intensive functions. As cheaper locations join value chains, those already participating must increase their capabilities or specialize in particular market segments. Upgrading worker skills becomes essential to remaining competitive.
	National system of innovation	Flows of technology and information among people, companies and institutions that contribute to innovation and technology development. This is important for closing the technological gap to support upgrading of domestic and foreign firms. Required at all stages of the value chain to drive efficiency and quality improvements.
Infrastructure and services	Transportation, ICT, energy and water	Impact of the cost and quality of these factors is compounded as fragmented production means inputs and intermediate goods must be transported between multiple locations. ICT facilitates the transmission of codified design specifications between actors in product-based chains and is the main medium for participation in cross-border service exports. Energy drives cost competitiveness in capital-intensive assembly and processing segments of the chain.
	Macro-economic stability and public governance	Macroeconomic stability exists when key economic relationships are in balance. Exchange rate volatility affects costs paid for inputs and price netted for exports. Governance includes traditions and institutions by which authority is exercised (e.g. rule of law, corruption, government effectiveness). Volatility can affect the timely delivery of goods and raise risk of inventory theft.
Business environment	Ease of opening a business and permitting or licensing	The procedures, time and cost for a new business to start up and operate formally and the process to obtain construction permits, water and mineral extraction permits, etc. Comparatively lengthy procedures can deter FDI due to other potential country alternatives, while undermining the development of domestic firms.
	Standards and certification	Codified public and private product and process requirements used to standardize supply across multiple suppliers. Standards can drive upgrading by disseminating information on improving quality and productivity; yet, developing country firms often lack the capital and expertise to master multiple certification requirements.
	Access to finance	The possibility individuals or enterprises can access financial resources based on use and accuracy of credit registries and effectiveness of collateral and bankruptcy laws. Essential for investments required to meet standards and other demands of GVCs. Lack of capital undermines potential of SMEs to engage in GVCs.
	Market access	Extent of tariffs and import restrictions in potential target markets affect potential to engage with different end-markets. Tariff escalation is particularly damaging as GVC trade takes place in similar tariff lines.
Trade and investment flows	Import tariffs	Tariffs charged on imported components, services and capital equipment required for the production or provision of exports become taxes on exports in GVCs.
	Export-import procedures	Complexity of and time taken to complete customs procedures managing imports and exports of products and services reduces reliability and timeliness of delivery.
	Border transit times	Time taken to move products and services through border crossings. Inefficient border crossings affect timeliness of product delivery to next stage of GVC or end-market.
Industry Institutionalisation	Industry-specific policies	Investment and export promotion policies designed to support specific industry participation and upgrading in specific segments of different value chains.
	Industry maturity and co-ordination	Experience of firms in participating in GVCs, presence of key chain actors such as input and service providers and the establishment, influence and representativeness of an industry association to reduce transaction costs for meeting requirements.
	Public-private co-ordination	Linkages and co-operation among private sector, government, educational institutions and others industry stakeholders (e.g. competitiveness and innovation councils and other types of “broker organisations”). Essential to rapidly identify and overcome challenges to chain participation.

A useful distinction may be drawn between those policies that aim to foster competitiveness economy-wide *versus* other initiatives that directly seek to alter production patterns through sector-specific interventions.¹⁵ The first approach focuses on such horizontal matters as infrastructure, connectivity, a business-friendly environment, access to finance, innovation and macroeconomic stability. The second involves more precise and targeted policies such as tariffs and other trade restrictions, subsidies, local-content or export-performance requirements, and restrictions on foreign exchange. That distinction is reflected in this analysis in a division between the traditional instruments of trade policy – that is, the regulation of goods and services at the border – and other, complementary areas of public policy.

A GVC focus brings new elements and actors to the fore. Standards and certifications previously played marginal roles in international trade, but they are now front and centre as determinants of competitiveness. Educational institutions can become core partners in providing the human capital development needed to exploit particular segments of the value chain. There is an increased emphasis on directly engaging the private sector (both foreign and domestic), the engine that powers international trade, in creating a competitive environment. Well-functioning national systems of innovation are now required to drive upgrading throughout the value chain.

Industrial policy is an area where governments must strike a balance between their efforts to promote opportunities and the temptation to overreach. Countries are putting in place a wide range of industrial policies aimed at upgrading their productive structure and increasing their participation in GVCs. These efforts can produce results, but generations of experience have also shown that it is all too easy for governments to go too far, especially if they try to “pick winners and losers” or confuse the appropriate roles of the market and the state. The risk of failure in industrial policies is high: information asymmetries reduce state planning capacities, governments face obstacles in quickly fine-tuning actions, and withdrawing support is difficult as lobbies will try to prevent change. Some of the hard lessons learned are summarized in Box 2.

This is not to suggest that there is no role for the state in promoting competitiveness and encouraging participation in GVCs. Many countries are using such schemes as sectoral technology funds to finance and promote innovation and to upgrade production in priority areas. These countries are also encouraging the creation of new firms, especially start-ups in areas related to ICT. But industrial policies *per se* are no guarantee of success. Resources to implement them, long-term commitment, implementation capabilities, and evaluation and monitoring are crucial. Empowered institutions and incentive-management schemes based on performance can help reduce the risks of capture.

Investment policies and policies to encourage the development of local suppliers play central roles in determining how developing countries can access and upgrade in GVCs as well as the net benefits that are accrued domestically. Across the sectors, perhaps with the exception of agriculture, emphasis has traditionally been placed on attracting MNEs alone, and insufficient attention has been paid to fostering the growth of local firms. Competition policy is another area that merits priority treatment. “Despite increased competitive pressures between economies trading in tasks within global value chains, and notwithstanding the strong enforcement record of many antitrust laws worldwide,” according to a joint study by the OECD, UNCTAD, and the WTO (OECD, 2013a), “the number of international collusive agreements and anti-competitive mergers is on the rise.”

Competition law and policy can help add value to exports from developing and least-developed countries (LDCs) by removing barriers to key sectors in GVCs. Many developing countries have adopted domestic competition and consumer laws and have used them as an effective tool to promote market-led poverty reduction strategies and to ensure that the benefits of trade and investment liberalisation are not negated by

15. See, for example, Low (2013).

private and government anti-competitive practices. Yet others, notably LDCs, still struggle with basic formulation and implementation of the competition and consumer laws and policies.¹⁶

Box 2. Negative lessons learned from failed industrial policies

Many countries have designed and implemented industrial policies to promote production transformation, reconversion, or upgrading. Sometimes these policies have been effective in achieving their objectives, but many others have failed. Even the success stories include several failures, as countries learn to design and implement policies through trial and error. While it is common to focus on the lessons from success cases, failed attempts can be equally instructive. The following points summarise some of the cautionary lessons learned from experiences in industrial policy design and implementation.

- *Indiscriminate subsidies.* Granting subsidies without conditionalities increases the risk of adverse selection of beneficiaries and the development of assistance-dependent behaviour among firms that are often not translated into productivity improvements.
- *Never-ending support.* The absence of sunset clauses in support programmes to companies discourages the necessary efforts to increase their productivity.
- *“Cathedrals in the desert”.* Building factories or research laboratories in remote locations works only when it forms part of a broader plan for creating backward and forward linkages, and when it is matched with programmes to foster local infrastructure development. Even then, such a policy is highly risky.
- *Preventing competition.* While the creation of new activities and industries may require support in early stages (the traditional “infant industry” argument), gradual exposure to internal and external competition can ensure that these activities grow in a productive way.
- *Closed-door bureaucracy-led prioritisation* limits the possibility of generating the information flows and the trust that are essential to get the private-sector commitment to invest in innovation and production development.
- *Capture by incumbents.* Consultations with the private sector often end up being led by incumbents, while innovation and production diversification also depend on the creation and expansion of new firms. Targeted mechanisms to encourage the creation of start-ups are needed to avoid the risks of policies that will only help to maintain the *status quo* instead of catalysing a dynamic change.
- *Low critical mass for investments* limits the effectiveness of industrial development plans. In addition, if the government contribution is too small, it will not be able to mobilise the matching funds from the private sector.
- *Short-term horizon and annual budgeting.* The creation and strengthening of domestic scientific, technological and production capabilities take time, so industrial policies with short-term horizons and based on annual budgets tend not to be credible. Multiannual plans and budgets are necessary to mobilise actions and achieve results, but this also requires effective mechanisms for monitoring and evaluation to correct implementation failures.
- *Lack of monitoring and evaluation mechanisms* limits the capacity to generate feedback between policy design and implementation and reduces the effectiveness of policies that evolve through trial and error. In addition, the lack of evaluation limits the possibility of regularly revising the policy to reduce the risks of capture and adverse selection.

In many industries today, including the and ICT sectors, research, development and innovation are key for the development of competitive firms, particularly in GVCs. Often, in these industries encouraging effective collaboration and sharing of ideas, including through standardisation ensures that progress and innovation are widely diffused and ultimately benefit the consumer. However, there is also a risk that standardisation limits competition on price, production, innovation and development and may raise barriers to entry, and can create opportunities for intellectual property right holders to abuse their position.

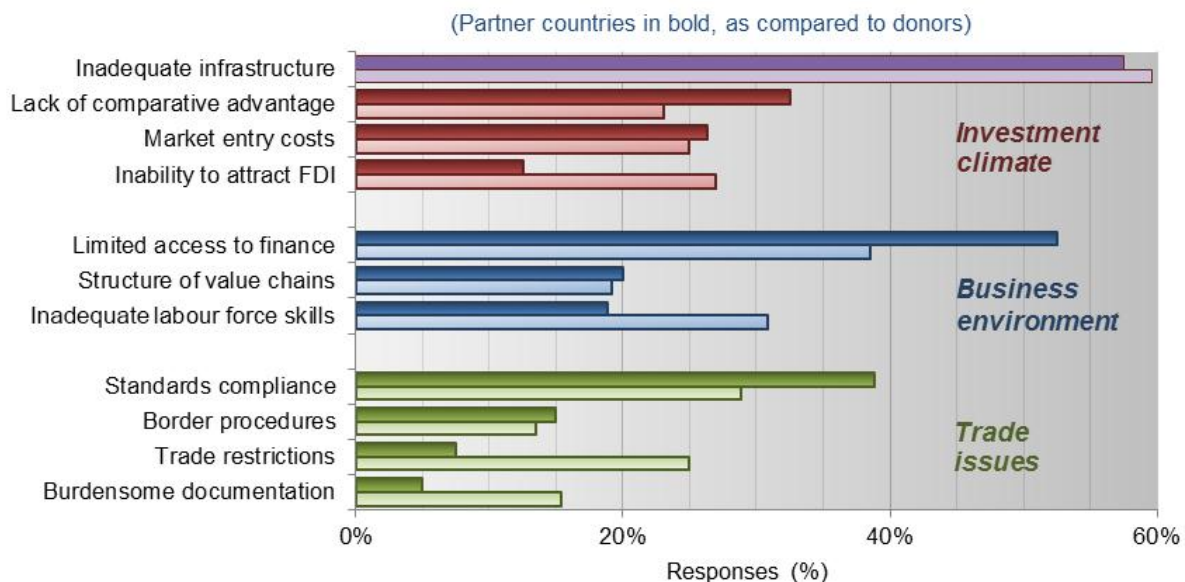
The ICT sector is one example of where standardisation is quite common and where the loss of competition inherent in broad industry use of a common standard – because the benefits of broad

16. It is nonetheless encouraging to note the increasing number of LDCs that have adopted competition laws in recent years including: Bangladesh, Burkina Faso, Burundi, Ethiopia, Gambia, Lao PDR, Madagascar, Malawi, Mali, Mozambique, Nepal, Rwanda, Senegal, Solomon Islands, Tanzania, Yemen and Zambia.

interoperability are highly valued – may lead to a situation where that standard becomes locked in overtime, limiting access of competing products or processes to the market. An important challenge for competition authorities today is to adopt an approach that promotes the benefits of standardisation while preventing its possible anticompetitive effects that can result from industry actors' decision to adopt standards that may restrict access of potential competitors to the market. There is a role for competition policy in promoting the development of multiple standards and competition between them.

All of these issues matter, but some are more significant than others. Their relative ranking differs, however, depending on whom one asks. That point can be appreciated from the survey results that are illustrated in Figures 6 and 7. A questionnaire on aid-for-trade conducted jointly by the OECD and the WTO in 2013 shows differing perceptions on the part of distinct stakeholders. Figure 6 reports the views of the public sectors in OECD countries and partner (i.e. developing) countries. Developing countries and providers of trade-related assistance highlight three main barriers that their firms face in connecting to value chains: inadequate infrastructure, access to finance, and standards compliance. They place slightly different emphasis on inability to attract foreign direct investment, lack of labour force skills, and the effect of trade restrictions and burdensome documentation.

Figure 6. Barriers firms face in entering value chains: Public sector views



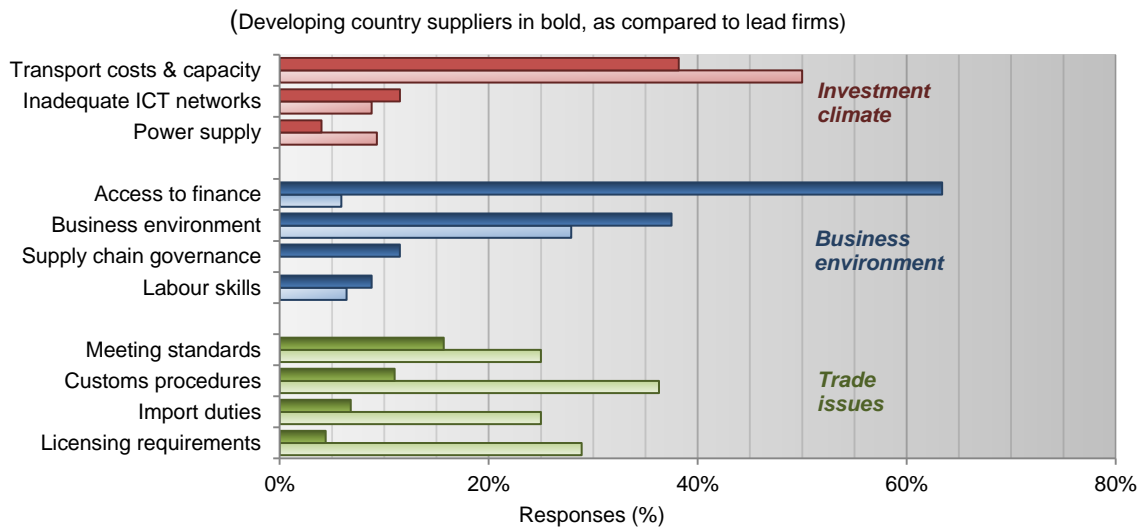
Source: OECD-WTO Aid-for-Trade Questionnaire (2013).

Figure 7 reports the different results obtained from a survey of the private sectors in the same countries. Suppliers from developing countries all ranked access to finance (and in particular trade finance) as the main obstacle preventing them entering, establishing, or moving up value chains.¹⁷ They also cited transportation and shipping costs, inadequate infrastructure, and regulatory uncertainty (often tied to a complex business environment) as major obstacles, together with a lack of labour force skills. Among lead firms customs procedures ranked highly as a particular obstacle to bringing developing country suppliers into their value chains as well as standards compliance issues. Informal practices and payment requests were also cited as of particular concern in their relationships with suppliers.

17. The views of the private sector were also sampled across five key sectors that are of particular importance for developing countries: agrifood, ICT, textiles and apparel, tourism, and transportation and logistics.

Some government interventions in the social sphere could help lift certain impediments to developing-country participation in GVCs. Policies seeking to harness informal entrepreneurship, particularly the informal businesses that seem to prevail in the downstream parts of GVCs in low-income countries, might also be beneficial. Government intervention here faces a dilemma. On the one hand, the informal sector often constitutes a testing and training ground for innovative or inexperienced entrepreneurs, so they can increase their skills, confidence and knowledge. On the other hand, informality may not allow a talented entrepreneur to achieve his or her full potential. After reducing red tape and enforcing property rights, public authorities might therefore concentrate on result-enhancing measures such as product take-back policies rather than coercive actions aiming to deter all informal business.

Figure 7. Barriers firms face in entering value chains: Private sector views



Source: OECD-WTO Aid-for-Trade Questionnaire (2013).

Bottlenecks in infrastructure

Considering the fact that infrastructure figured more heavily than trade issues in the survey results reported above, it is fitting that we reproduce that order here. The ability of firms and countries to participate in GVCs is greatly affected by the quality of such physical infrastructure as roads, ports, and airports, as well as the efficiency of the procedures followed in the operation of these facilities. In a world where just-in-time delivery is now the norm, and in which transit is rapid and storage is expensive, time is quite literally money. For products ranging from electronics (which can quickly become obsolete) to fruits and vegetables (which are perishable) to apparel (which is seasonal and subject to the whims of fashion), a day's delay is equivalent to a tariff of 1% or more. This is evidenced by the willingness of traders to pay more for faster air freight than they do for slower water freight,¹⁸ even when shipping costs are significantly higher than tariffs or other trade costs.

Infrastructure development is an important element in enabling developing countries to participate in GVCs. The ability of developing country firms and industries to engage in trade is determined much more by the quality of their port facilities (sea and air) than by the types of preferential access that they might enjoy in major industrialized markets. Reliable and cost-competitive infrastructure facilitates both trade linkages and FDI attraction. Significant gaps in the provision of infrastructure hold back competitiveness and the expansion of production in developing countries. These economies therefore need to invest more in infrastructure, but

18. Hummels et al. (2007).

above all to improve the effectiveness of public infrastructure policies. Coordination between different agencies in charge of such policies is essential for overcoming multiple gaps, including coverage, access, and costs.

Developing countries face resource and capacity constraints to providing high quality infrastructure throughout the entire economy. Whereas telecommunications links are crucial for participation in offshore services GVCs, transportation and energy infrastructure play a more important role in manufacturing and extractive GVCs. Even when infrastructure projects are driven by the private sector, governments in developing countries should seek to direct investments in such a way that domestic firms are not excluded from the benefits associated with GVC participation.

The impact of good governance on competitiveness can be illustrated by the case of capital expenditures on infrastructure. Poor budget implementation is a major constraint for some countries. Budgetary predictability in capital expenditure is particularly weak in Central America and the Caribbean, South Asia, and Africa. The quality of budgetary execution reflects the extent to which actual expenditure matches intended expenditure.

More than 30% of African and South Asian countries, and close to 25% of countries in Central America and the Caribbean, execute less than 80% of their budgeted capital expenditure. For instance, Angola historically under-performs in budget execution, having spent only 34% of its budgeted capital expenditure in 2010. In Kiribati, a least developed country (LDC) in the Pacific, budget execution in 2009 was only 20%. IMF and World Bank assessments confirm that low-income countries suffer from particularly weak budget execution.¹⁹ This does not mean that infrastructure financing should not increase, but additional financing will fail to reduce infrastructure gaps unless budget execution rises.

Latin America's experience with concessions in the transport sector reveals a history of numerous and costly renegotiations. Governments have applied the model of concessions to the development of airports, roads, railways, seaports and multimodal terminals, first in the late 1980s and early 1990s in Argentina, Chile and Mexico, and later in Brazil, Colombia, Peru, and in Central America and the Caribbean. Difficulties in the execution of concession contracts led some policymakers to question the model. In the 1990s, close to 50% of transport concessions were renegotiated in Argentina, Brazil, Chile, Colombia and Mexico. In Chile, the average concession was renegotiated four times between 1993 and 2007. Nearly a quarter of investment in concessions derived from renegotiations. Today, 40% of existent road concession contracts have been renegotiated in Latin America. Fifty out of the 60 road concessions in Chile, Colombia, and Peru were renegotiated up to 2010.²⁰ The additional fiscal costs amount to 50% of the initial value of the contracts.

Trade barriers

Trade policy *per se* may figure less prominently in the GVC-led global economy than it did in past generations, but nonetheless remains a critical part of the policy mix. The way that trade policy is conceived, however, requires some reordering. Policymakers must now give as much consideration to imports as they traditionally have to exports, and they must value time as much as tariffs. Participation in geographically fragmented GVCs frequently requires quick and inexpensive movement of goods over borders, and delays in those movements can be fatal to the aspirations of an upwardly mobile economy.

Border measures affect the timeliness and cost with which firms can access inputs from abroad and export their products. Hence, reducing import tariffs and export procedures is often a critical step for competitively engaging in GVCs. More specifically, in the absence of multilateral reductions in tariffs, developing countries should seek trade agreements on tariffs, tariff escalation and standards harmonisation with other developing countries. Previously, developing countries focused on securing trade agreements with

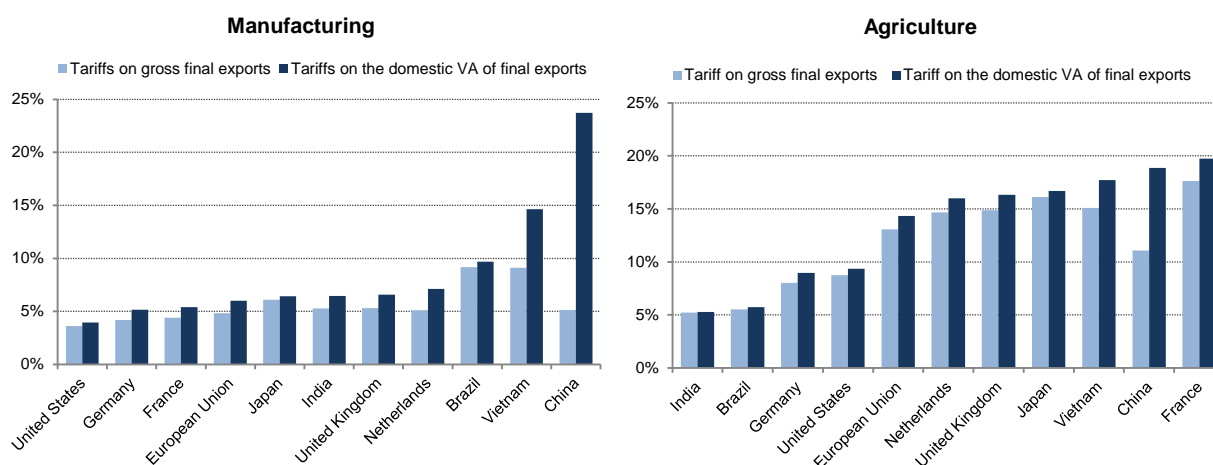
19. Allen and Last (2007).

20. Bitran et al. (2013).

developed-country markets. Today, the trade of intermediate goods in regional and global chains is often between developing countries, and emerging economies are becoming important end-markets. Import and export tariffs between these countries continue to be relatively high.

While tariffs are no longer as important in most channels of trade as they once were, the intricate structure of GVCs can multiply the effects of even nuisance-level rates of duty (Figure 8). In one example, a disk drive is assembled in Thailand, which acts as a hub for a supply network involving 43 components from ten other countries and ten components produced in Thailand.²¹ The disk drive is then sent to China, which serves as a similar hub for the assembly of a laptop computer, which is finally sent to the United States. Koopman et al. (2010) calculate so-called “tariff-magnification ratios” for manufacturing products and show that taking into account tariffs along all stages of the supply chain raises significantly the effective tariff protection.²² Indeed, empirical evidence shows that this magnification effect is particularly important in sectors characterised by long-value chains with several production stages, such as communications and electronics, motor vehicles, basic metals and textiles.

Figure 8. Tariffs on the gross value and the domestic value-added of exports, 2009



Applied AVE tariffs, weighted by the share of each sector and destination market in the country's agricultural or manufacturing exports. For EU countries, tariffs are calculated on extra-EU exports.

Source: OECD (2013a).

Research highlights the adverse effect of intermediate input tariffs on both industry structure and trade. For instance, a recent OECD study (OECD, 2014b) suggests that if tariffs on electronics were to be reduced in a country where such tariffs are high (e.g. Brazil) to the median level in the sample of countries included in the analysis, electronic exports could increase by 26%. Furthermore, intermediate input tariffs not only affect exports in the same industry, they also have a sizeable negative effect on exports of downstream industries. For instance, if a country with high tariffs on textiles (e.g. South Africa) were to reduce them to the median level in the sample of countries included in the analysis, exports of clothing from this country, whose inputs embed more than 40% of textile products, could increase by more than 30%.²³

21. Hiratsuka (2005), Baldwin (2006).

22. The study found that in 2004 the effective tariff rate was 17% higher than the nominal rate in the United States, 46% higher in Korea and as much as 116% and 171% higher in China and Mexico, respectively, due to multiple border crossings in trade.

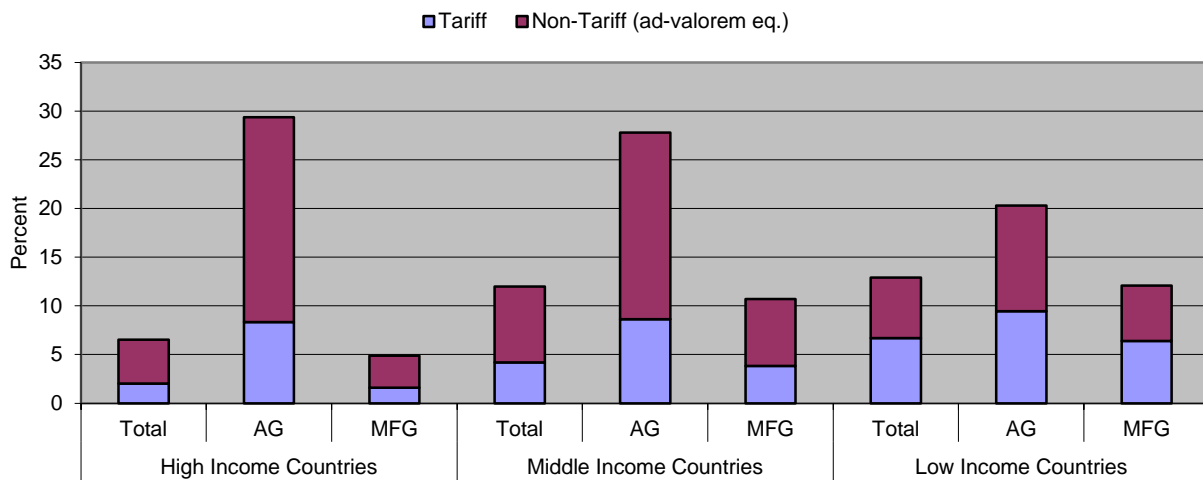
23. These effects may appear large, but it should be noted that the tariff reductions in the example are sizeable, around 10 percentage points.

Some actions that countries take to facilitate the importation of inputs are much less comprehensive than the elimination of tariffs through either multilateral or regional agreements. They may instead offer special treatment to imports in special economic zones (SEZs) or related programs, which can take on a variety of forms; examples include *maquiladoras* in much of Latin America or foreign trade zones in China or the United States. The implementation of SEZs can have ambiguous implications for GVC participation. Creating SEZs can help to attract GVC activities that are highly responsive to tariffs, and thus may feature as a strategy for insertion. There is however a risk that SEZs may remain isolated pockets of production, and that host countries may become too vulnerable to changes in the strategies of MNEs. SEZs do not necessarily help to create the spill-overs and linkages that facilitate upgrading among domestic firms if participating firms engage in little more than processing activities. MNEs that locate facilities within SEZs may do so as part of a cost-reduction strategy, and may therefore be less likely than domestic firms to prioritise functional upgrading or R&D investments. Once wages and costs in the host country increase above a certain threshold, these activities may move to an economy that offers lower costs as MNEs have become increasingly footloose. Furthermore, SEZs or duty drawback systems do not allow second tier domestic suppliers to join GVCs. High and escalating tariffs act as a kind of “currency overvaluation,” pricing out domestic suppliers. The risk is particularly acute for small economies where access to the domestic market or local knowledge is of limited importance to MNEs’ location decisions. Responding to this risk requires combining integration in GVCs with strengthening domestic capabilities to enhance productivity and innovation.

Non-tariff measures raise specific concerns for GVC participation

Non-tariff measures (NTMs) can also block the efficient operation of supply chains. NTMs consist of any policies (other than ordinary customs tariffs) that influence trade flows. Although non-tariff measures should not have protectionist intent, they nevertheless can have an impact on trade costs that is of much larger magnitude than tariffs (Figure 9).

Figure 9. Average level of restrictiveness imposed on imports



Source: UNCTAD (2013), based on UNCTAD TRAINS/WITS database.

One form of trade barrier that appears to be on the increase is local-content requirements (LCRs) (Hufbauer et al., 2013). These have been used in a number of cases by governments that have established domestic policies supporting the generation of electricity from renewable energy, especially wind energy and solar photovoltaic energy, leading to several high-profile trade disputes (Box 3). Within the context of GVCs, policy measures aimed at protecting domestic solar PV and wind-turbine manufacturers may hinder downstream investment in renewable-energy-based power generation by raising the cost of inputs, which can result in increased installation costs and reduced demand for renewable energy. This in turn could lead to sub-optimal levels of international and domestic investment throughout the solar PV and wind energy GVCs, while increasing investment risk by raising the prospects of trade disputes.

Box 3. Trade and investment barriers: The case of LCRs affecting renewable energy

Trade and investment barriers are particularly challenging in renewable energy, as they may hamper the optimisation of emerging GVCs in the production of solar photovoltaic (PV) and wind energy. The manufacture of solar PV panels, wind turbines, and intermediate components is increasingly spread across countries and integrated within GVCs, accounting for a growing share of international trade of intermediate products (especially solar PV panels).

Over the past decade, governments from developed countries and emerging economies have provided substantial support to solar PV and wind energy that has been crucial in stimulating both domestic and international investment. Since 2008, however, the perceived potential of green energy to serve as a lever for growth and employment has led several governments, in a post-crisis recovery context, to design incentive measures aimed at supporting domestic solar PV and wind-turbine manufacturers, notably through granting preferential access to financing (e.g. via low-cost loans or loan guarantees); improving the export performance of solar PV and wind energy component manufacturers through targeted measures; encouraging domestic and foreign firms to purchase solar or wind-turbine equipment manufactured locally (e.g. by imposing local content requirements, or LCRs, as a precondition for benefiting from a feed-in tariff or to win a public tender); or restricting imports (e.g. through tariffs).

The majority of these measures aim at developing a domestic manufacturing base in solar and wind energy, or protecting domestic manufacturers against the alleged use of trade-distorting subsidies by countries seeking to support their own exporting producers. OECD research shows that LCRs for solar or wind energy have been planned or implemented at national or sub-national levels in at least 15 developed countries and emerging economies, for the most part since 2008. Several countries have also used direct financial transfers and tax credits to provide preferential access to finance for domestic solar PV or wind-turbine producers. Other policy impediments to international trade and investment exist, such as limits on foreign ownership, but remain relatively limited in OECD countries. More research is needed to assess the importance of technical barriers to trade (e.g. divergent standards) and operational obstacles (e.g. preferential access to the grid or to land).

The widespread use of LCRs in solar and wind energy has resulted in several WTO disputes – five out of a total of 63 WTO disputes since September 2010. The alleged use of dumping or harmful subsidies has resulted in an escalation of domestic trade remedies involving solar PV and wind energy. Since 2012, several large developed and emerging economies have launched investigations into alleged dumping and subsidising, leading to the imposition of anti-dumping duties, countervailing duties, or both, on a variety of products associated with solar PV and wind energy.

Sources: OECD (2014c, *forthcoming*); WTO, *Chronological list of disputes cases*, www.wto.org/english/tratop_e/dispu_e/dispu_status_e.htm, accessed 2 March 2014.

Further increases in trade costs can originate from the required compliance with a multitude of standards and technical regulations which may be particularly burdensome for SMEs that participate in GVCs.

The rising number of quality and safety standards is in part driven by concerns about information, coordination, and traceability, which are more acute in a world dominated by GVCs. While the need to protect final consumers through appropriate quality standards is clear, the complexity and above all the heterogeneity of such standards has become one of the main barriers to insertion into GVCs, in particular for small and medium-sized enterprises.

The multiplication of environmental and social sustainability standards can also pose a barrier to entry to GVC participation by SMEs, even if those standards are voluntary in the country of end-product retail. The voluntary adoption of such standards by retailers with major market share applies a *de facto* obligation up the

supply chain (e.g. Walmart’s commitment to sell 100% MSC-certified fish products). Harmonisation of both public and private voluntary standards, through national or international guidelines, could help here.

Upstream firms supplying components to several destinations may have to duplicate production processes to comply with conflicting standards, or incur burdensome certification procedures multiple times for the same product. In food value chains, process standards adapted to one country’s requirements may render exporting to another country infeasible. Promoting the convergence of standards and certification requirements and encouraging mutual recognition agreements can go a long way to alleviating the burden of compliance and enhancing the competitiveness of small-scale exporters. This is true for sustainability standards as well as for quality and safety standards.

Issues affecting trade in services are similar to, but in some ways distinct from, those affecting trade in goods. Restrictions on market access on services in the international marketplace can have a direct impact on manufacturing, agriculture, and mining. This is particularly true for services that act as essential enablers in the geographic dispersion of GVCs. Such services include ICT, which reduce the cost of coordination for GVCs and are an important enabler of trade in services, supply chain management services (to reduce inventories, shorten lead times, and enable faster customer response), and improved logistic services, including real-time monitoring of physical assets worldwide through the “Internet of Things”. High-quality professional, technical, and financial services also enable GVCs and help firms create value in GVCs through differentiation and customisation.²⁴ The quality of services supporting GVCs in a given country depends not only on market access for qualified foreign providers, but on a robust national education system to train local entrants.

The openness of national markets to foreign service providers varies widely across countries (OECD, 2014d). There are significant restrictions on entry, ownership, and operations, and licensing procedures remain highly discretionary in many countries. In both industrial and developing countries, professional and transportation services are among the most protected industries, whereas retail, telecommunications, and even finance tend to be more open. Nonetheless, there are significant niches for developing-country provision of services in support of GVCs. After the Great Recession of 2008-2009, cost pressures on multinationals led to increasing outsourcing of business processes, knowledge processes, and information technology to developing countries.²⁵

In sum, in a world characterised by geographical fragmentation of production, policies aimed at supporting production of specific industries by protecting them from foreign competition seem even less likely than in the past to reach the intended target of sustaining activity in the protected industries.

24. USITC (2013a, b).

25. Gereffi and Fernandez-Stark (2010).

PART III.

DOMESTIC AND INTERNATIONAL AGENDAS TO IMPROVE GVC PERFORMANCE

The preceding analysis reviewed the multiplicity of factors that affect competitiveness, all of which speak to the need for countries to take a multi-pronged yet concerted approach that cuts across different policy domains. No one field of public policy or firm behaviour can offer the “silver bullet” for a country or firm, as eliminating barriers in a single area may be insufficient to trigger investment or scaling up of existing activities if other policies or shortcomings continue to weigh down the supply chain with significant costs.

There is scope for policy interventions in several areas to promote growth in GVCs. Horizontal policies with economy-wide effects, such as a stable economic and political environment, human capital development, and a national infrastructure of roads, ports and telecommunications systems have been widely embraced. Sector-specific support policies, on the other hand, are often aimed at “picking winners” and have not been very successful. Moreover, they distort international competition. Today there is an emerging shift towards the idea that in order to engage in specific GVCs countries require policies that go beyond broad initiatives focused on fostering competitiveness and investments.²⁶ In countries that have successfully engaged in linking to and upgrading in GVCs, several institutional actors have begun to address these constraints more actively. These include governments, businesses, civil society, and international organisations.

Participation in GVCs requires a high level of coordination and collaboration across industry stakeholders in the public, private, and even non-profit sectors in order to ensure that interests are aligned, skill gaps are closed, and structural constraints are addressed. Sustained interaction among industry stakeholders can be promoted through a number of mechanisms. Strategic public and private councils for selected industries can help identify the most pressing constraints facing developing countries. Industry associations that include both MNEs and local firms can promote multiple forms of collaboration, such as certification initiatives and joint ventures. Intra-governmental coordination is extremely important to gainful GVC participation as well. Co-operation at the inter-ministerial level helps to ensure that infrastructure, education, investment and trade policies jointly contribute to development goals. More modestly, developing countries can do a lot to facilitate upgrading simply by coordinating the activities of export promotion and investment attraction agencies.

The reforms discussed here could each be taken up for consideration in particular in the context of G20 National Growth Strategies and a possible G20 Growth Compact.

26. Gereffi and Sturgeon (2013); Milberg et al. (2014); OECD and WTO (2011).

Sound public institutions can enhance trade in industries with long value chains

Sound public institutions that facilitate contract enforcement, adequately secure property rights and investor protection, ensure an impartial judiciary and reduce corruption, allow agents to more easily overcome frictions that arise when two parties enter into a production-trade relationship.²⁷ Thus, the quality of institutions can enhance aggregate growth by increasing trade. It allows industries that depend more on a large set of intermediate inputs (e.g. through long value chains) or on non-contractible inputs (e.g. intangibles assets) to grow faster.²⁸ For instance, evidence shows that regulatory quality (measured by the World Bank's index on regulatory quality)²⁹ can boost trade of industries that rely on a large variety of inputs. OECD estimates suggest that improving the regulatory quality from the median to the level of countries with relatively good institutions (i.e. at the 75th percentile of the distribution of countries included in the analysis) could increase exports in industries that rely on a wide variety of inputs (e.g. basic metals or electronics) by around 5%. Furthermore, the same change in regulatory quality increases total imports on average by 3%, reflecting that the ability to source intermediate inputs and to integrate into global production chains are facilitated by high-quality institutions.

Raising skills can facilitate knowledge-intensive participation in GVCs

GVCs depend critically upon competence and competitiveness in the performance of specific tasks, and ultimately upon the education and skills of the workforce and its entrepreneurs (OECD, 2013). Participation and upgrading within value chains requires investment in innovation and knowledge-based capital, such as R&D, intellectual property, software, and data, as well as economic competencies such as organisational know-how and branding. GVCs are a reflection of an international fragmentation of production that has given rise to new opportunities for the exploitation of domestic factor endowments, including human capital. They thus have distinct effects on the position of different skill groups in different countries.

Countries that are tied in to GVCs generally have higher skill levels than those that are not, and participation in these value chains sharpens that distinction as firms and workers learn. Research drawing upon the World Input-Output Database (WIOD) shows that in most OECD countries the share of high-skilled workers in total GVC manufacturing employment increased much faster than the share of low-skilled workers (Figure 10). Conversely, vertical specialisation in developing countries leads to significantly more labour content in medium- and low-skill than in the high-skill end of the spectrum.³⁰

In comparing OECD and emerging economies a contrasting picture emerges also at the sectoral level. While the decline in demand for low-skilled labour over 1995-2008 in OECD economies was to a large extent driven by a reduction in the demand for low-skilled labour within manufacturing or services (other than business services), these sectors contributed to creating low-skill jobs in emerging economies where the decline in low-skilled demand originated from natural resource sectors. The sizeable increase in demand for high-skilled labour was mainly driven by an increase in demand for high-skill workers in services, albeit in some countries (e.g. China, India, and France) manufacturing also added to high-skill demand.

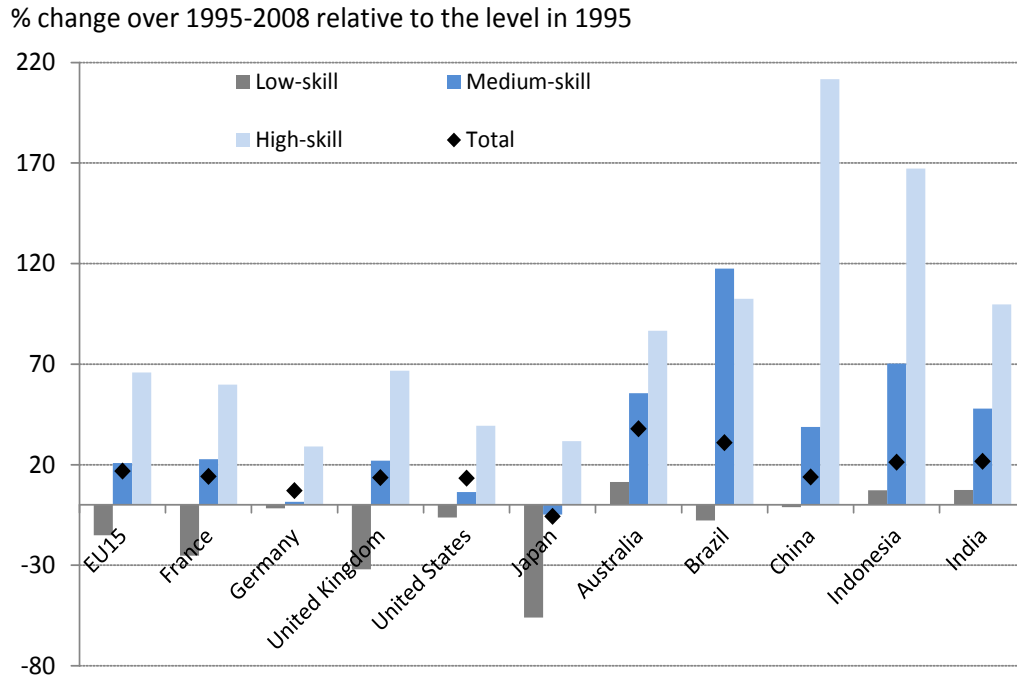
27. Anderson and Van Wincoop (2004); Nunn and Trefler (2013).

28. Nunn and Trefler (2013).

29. The index of regulatory quality measures the ability of government to formulate and implement sound policies and regulations and captures, for instance, how prevalent unfair competitive practices are and how easy it is to start a business

30. Jiang (2013).

Figure 10. Final demand developments implied that demand for high-skill labour rose across most countries over 1995-2008



Source: OECD, 2014b.

These broad patterns can be seen in the more specific experiences of individual countries and regions. The share of medium-skilled workers declined in the United States during the 2000s, while that of low-skilled services workers rose sharply and the share of high-skilled workers remained relatively flat. Evidence for Europe also shows employment shares of both high-skilled and low-skilled workers increasing at the expense of medium-skilled employees. Likewise, the return to skills has especially declined in the middle segment, with relative (and in some countries even absolute) wages shrinking in occupations dominated by routine, medium-skill tasks.

Workers that perform manual or cognitive tasks that lend themselves to automation or codification (e.g. book-keeping, monitoring, and information processing) are most likely to be affected by GVCs; many of these tasks can potentially be offshored. Nevertheless, such tasks may be complementary to those that cannot easily be digitized or offshored due to high transaction costs or the need for contact with customers. Highly skilled workers are less likely to be affected, as they tend to perform non-routine cognitive tasks that complement information technology; demand for such workers often increases with greater investment in information technology. Low-skilled workers engage in non-routine tasks such as operating vehicles and assisting and caring for others, which may be less affected by trade or technology. GVCs clearly contribute to the shifting demand for skills, but again it is difficult to know how much is due to trade and how much to technology.

Tailoring skills training and other human capital development initiatives is essential for entry into GVCs and upgrading within industries. Developing countries often face bottlenecks in filling key technical positions to meet the process upgrading requirements of GVCs. Human capital is an especially great constraint in countries where limited educational resources have been targeted towards professional and university education rather than technical and vocational education. Technical workers are often central to ensuring standards compliance, be it the tracing of foodstuffs, operating large drilling equipment, or ensuring each product run in the factory meets quality requirements. Skills training is often undertaken by the government alone, particularly in the agricultural and mining sector. These programs tend to be understaffed, however,

and may be based on outdated methodologies. Leveraging buyers to train local staff can be a more efficient means of knowledge transfer in the context of GVCs because information is up-to-date and corresponds to the needs of the lead firms. Recent work in the context of the OECD Skills Strategy has generated new evidence on the differences in education and skills across countries. For example, the recent Programme for International Student Assessment of mathematics, reading, and science found large differences, with some countries (e.g. Japan and Korea) and specific regions or cities (e.g. Shanghai) having very high test scores relative to other areas. It is no coincidence that these are also centres of high GVC connections. Among the conclusions reached from these studies³¹ are the following:

- Education alone is no longer enough as skills need to adapt over time. Countries need to combine high-quality initial education with lifelong learning opportunities for all to help ensure that workers are well prepared for the future.
- Promoting training in occupation-specific and general skills is an important facet of developing a workforce adapted to jobs needed for an economy to grow in the context of increased integration of production processes.
- It is important to strengthen links between the world of learning and the world of work, to ensure that education and training are relevant to the evolving skills needs in the labour market.

Given the speed with which production technologies evolve, as well as the exacting requirements of quality and process standards that characterize GVCs, and indeed the process of economic development itself, effective and responsive education and workforce development policies are critical to enabling profitable participation in GVCs. Developing countries hoping to move into mid-value segments must typically focus on technical education, while upgrading into higher-value pre- and post-production services requires the development of managerial and design talent. Improving labour mobility, skills certifications and regulations governing the employment of foreign nationals can help to fill bottlenecks in the short term, keeping in mind that the long-term goal should be to upgrade the general skill level of the workforce. Developing countries should especially consider complementarities between national systems of innovation and workforce development institutions in devising strategies for industrial upgrading.

GVCs and innovation

Investment in innovation is an important driver of GVCs. The highest proportion of value creation in a GVC is often found in certain upstream activities such as new concept development, R&D or the manufacturing of key parts and components, as well as in certain downstream activities such as marketing, branding or customer service. Such activities involve tacit, non-codified knowledge in areas such as original design, the creation and management of cutting-edge technology and complex systems, as well as management or organisational know-how.

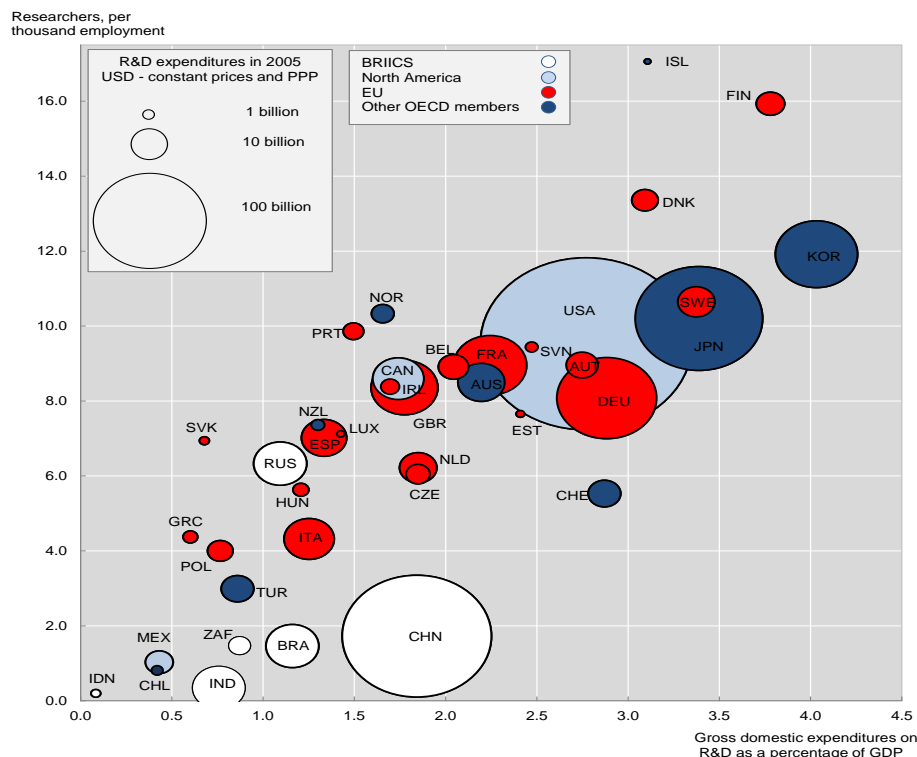
By forging linkages between people, companies (domestic and foreign), and institutions, national systems of innovation (NSIs) support knowledge and human capital formation related to engineering and product development in order to promote knowledge dissemination, innovation, and upgrading. These are particularly important both for improving the position of local firms and attracting FDI in the manufacturing, offshore services, and mining value chains, given the rapid pace at which technology requirements evolve in these sectors. NSIs are often absent or weak in developing countries, however, and there is a tendency to relegate their importance only to high-value product development stages of the chain. The limited R&D that is performed is typically under-utilised as a result of poor coordination and collaboration between different actors.³²

31. See OECD (2014e).

32. Farfan (2005); Gereffi et al. (2011).

Investment in innovation has grown steadily in both advanced and emerging economies. In the United States, the business sector has invested more in knowledge-based capital (KBC) – software, data, R&D, firm-specific skills and organisational capital – than in tangible investment since the mid-1990s. In several other OECD economies, such as the United Kingdom, this is also the case. But emerging economies also are investing increasingly in such assets. Estimates suggest that China invested 7.5% of GDP in such assets, of which less than 20% was in R&D, primarily in software and design. In Brazil, such investment amounted to about 4% of GDP over the past decade, whereas it stood at just under 3% of GDP in India in 2007. These developments can also be seen in global investment in R&D, where emerging economies account for a rapidly growing share of total investment, with China's R&D intensity recently surpassing that of the European Union (Figure 11).

Figure 11. R&D investment in OECD and G20 economies, 2011



Source: OECD, Science, Technology and Industry Scoreboard 2013.

Investments in KBC drive productivity growth and determine the extent to which the final product of a value chain can be differentiated in consumer markets. For example, much of the success of recent Apple products is due to design features. The value that a firm creates within a GVC also depends on the difficulty for rivals to supply similar or substitutable products. When a product is easy to replicate, e.g. when it is not tacit or not protected by intellectual property rights (IPR), rival firms can easily develop substitutes for the inputs that a firm provides to a GVC.

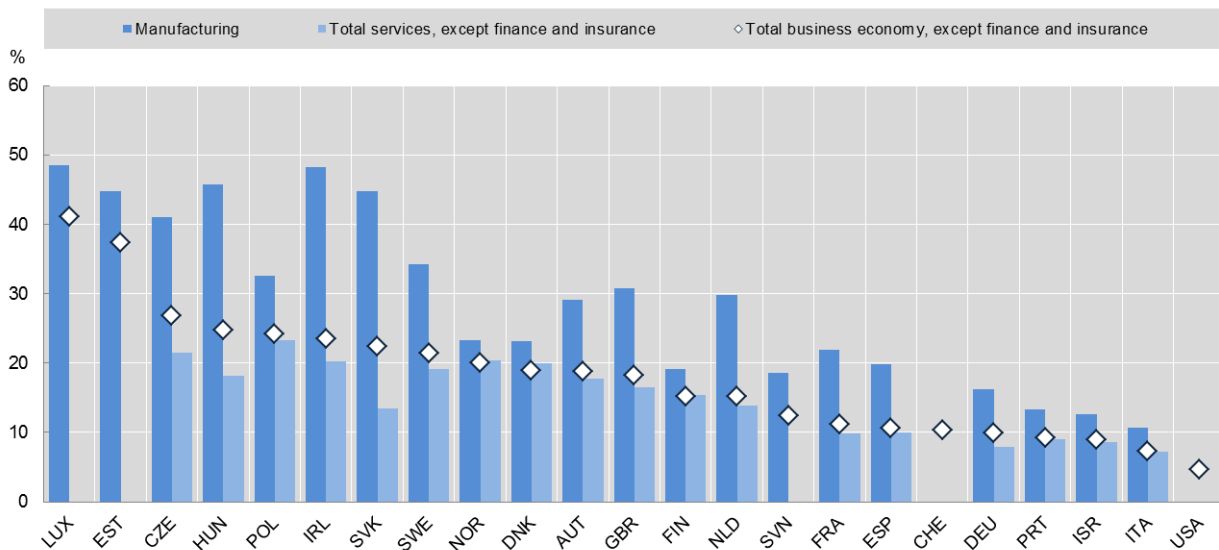
The use of KBC in the upgrading of value chains will also require experimentation by entrepreneurs and firms of all sizes with new ideas, business models and organisational forms. Such firms are not only important for innovation, but also crucial to job creation. Recent OECD work covering almost 20 countries, including Brazil, shows that young firms (5 years old or less) accounted for most net job creation over the past decade, with older, incumbent firms typically losing jobs. In Brazil, almost 70% of the jobs created between 2001 and 2011 were in such young firms.

Policy can help make it easier for firms to implement and commercialise new ideas, lower the costs of failure and encourage firms to take risks and experiment with potential growth opportunities. Innovative firms can play a key role in diversifying countries’ participation in GVCs and in supporting the upgrading process. All of this requires well-functioning product and labour markets and bankruptcy laws that do not overly penalise failure. Recent OECD work shows, for example, that reducing the stringency of bankruptcy legislation from the highest to the average level in the OECD could raise capital flows to patenting firms by around 35%, thus supporting the reallocation of resources to the most innovative firms. Ensuring that existing policies for innovation, such as R&D tax credits, do not unduly favour existing firms can also help foster entrepreneurship and experimentation.

GVCs and foreign direct investment

While much of the focus has been on the role of trade, foreign direct investment is a basic building block of GVCs and a large share of global trade within GVCs is undertaken within MNE networks. The share of national employment by foreign affiliates for most OECD countries is greater than 20% (Figure 12), with some notable exceptions (e.g. the United States). Foreign affiliates also play an important role in China, accounting for almost 85% of processing exports in 2011, and about 28% of ordinary exports. Some OECD countries provide data on the outward investment of the foreign affiliates of their MNEs, which points to the important role these firms play in value creation, employment and exports. For example, affiliates of US multinationals accounted for about USD 70 billion of Canadian (gross) exports in 2010, USD 35 billion in Mexico, and some USD 10 billion in the United Kingdom, Japan, and Germany. Exports from emerging economies are still relatively low.

Figure 12. Share of national employment under control of foreign affiliates, 2010

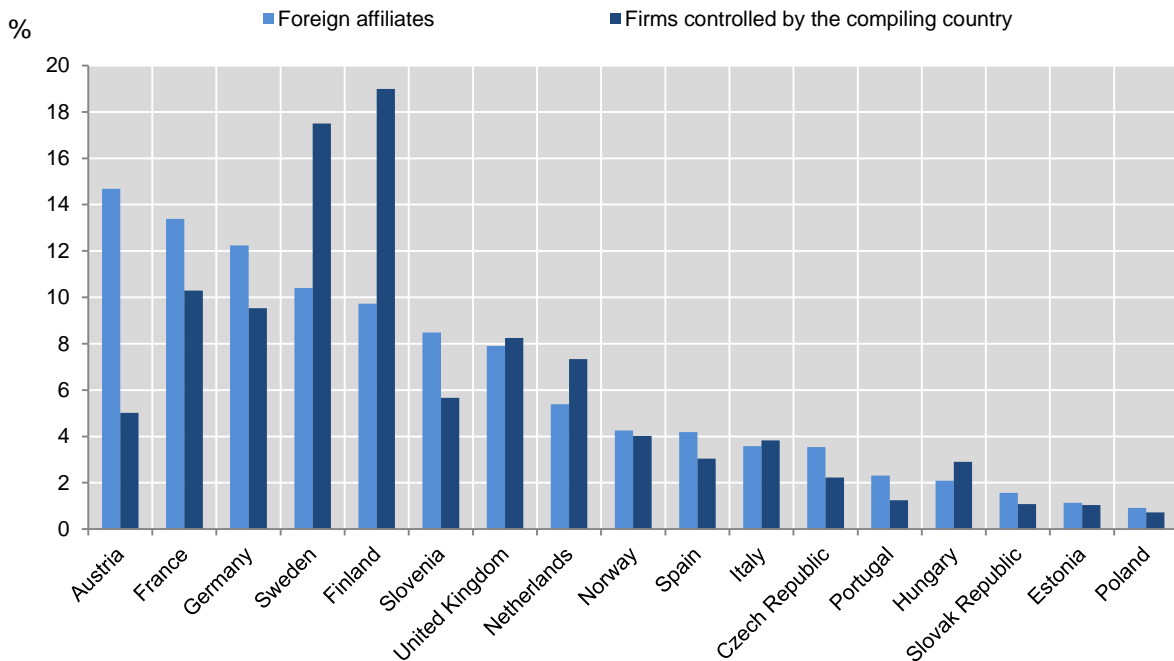


Source: OECD, AMNE database.

In addition to these “direct” economic benefits, MNEs’ presence may also indirectly benefit host economies. MNEs are among the most important vehicles for technology transfer across countries, including through and forward linkages with local firms, imitation and demonstration effects, as well as movements of workers from multinationals to local firms. However, these spill-over benefits do not occur automatically. They depend on the propensity of foreign affiliates to invest in knowledge-based capital and technology relative to other firms (Figure 13), and the intensity of the linkages between foreign affiliates and domestic companies (OECD/WTO, 2011). Linkages between MNEs and domestic firms may suffer as MNEs often

develop protective mechanisms to prevent their knowledge from spilling over to local competitors, especially in countries where the enforcement of intellectual property rights (IPRs) is weak. Moreover, local firms often lack the necessary absorptive capacity for the advanced technology and skills of MNEs (Blomstrom and Kokko, 2003). Spillovers will only arise if local firms invest and learn to absorb foreign knowledge and skills.

Figure 13. R&D intensity in the manufacturing sector



Note: R&D intensity = intramural R&D expenditures / value-added. 2007 data for Norway and Portugal; 2009 data for Austria, the Czech Republic, Estonia, Finland, Germany, Hungary, Poland, the Slovak Republic, Slovenia, Spain and Sweden; 2010 data for France and the United Kingdom; 2011 data for Italy and the Netherlands.

Source: OECD, AMNE database.

Financial development can alleviate cash constraints and facilitate GVC participation

Well-functioning financial systems can promote long-term growth by reducing information and transactions costs, providing appropriate incentives for business governance and easing external financing constraints that impede firm growth and the efficient allocation of resources.³³ More developed financial systems can also increase the volume of trade,³⁴ which in turn can raise growth by, for instance, facilitating access to technology. Firms' ability to export and import depends on trade costs, including financial costs. By lowering the cost of trade, well-functioning financial system can increase the number of potential trading partners and the volume of trade. Financial development can also affect specialisation by promoting faster growth in industries that depend more on external financing.³⁵ The need for external finance tends to be greater in the start-up phase of firms and particularly in industries with large initial investment and continued

33. See, for example, Andrews and Criscuolo (2013).

34. Chor and Manova (2012).

35. For example, Rajan and Zingales (1998); Beck (2002).

investment requirements combined with long cash harvest time (e.g. electronics and pharmaceuticals).³⁶ These industries also tend to be comparatively more innovative than other industries, adding to aggregate growth.

Estimates suggest that financial development (measured by the ratio of private credit to GDP) enhances trade, particularly in goods whose production is highly dependent on external finance. For instance, if financial development were to increase from that of the median country to the level of the country at the 75th percentile among the countries included in the analysis (e.g. from Estonia to Sweden), this would increase total exports by 3% (OECD, 2014b). However, this change could increase exports of industries that are highly dependent on external finance (e.g. electronics) by 6% and increase their value-added share of GDP by 0.2 percentage points.³⁷ The same increase in financial development could increase imports by as much as 4%. Thus, well-functioning financial markets can create spillovers to trading partners.

Adaptive product and labour market regulations can promote GVC participation

The capacity of countries to reap the full benefits of trade integration by adapting their industrial structure depends on their ability to reallocate resources accordingly. Studies have found that well-functioning labour and product markets improve the ability to continuously reallocate resources towards their effective use, with positive implications for growth.³⁸

Burdensome product market regulation hampers the ability of firms to adjust to rapid change by hindering growth of the most efficient firms and preventing the exit of inefficient ones.³⁹ For example, in industries (e.g. pharmaceuticals, electronics, hotels, and restaurants) with naturally higher reallocation needs (measured by firm turnover) stringent regulations can reduce the efficiency of these industries disproportionately. Estimates suggest that a reduction in the stringency of product market regulations from the top quartile (e.g. Russia) to the median (e.g. France) would increase the value-added share of industries with a structurally high turnover by 0.1 percentage points.⁴⁰ If firms and industries that require higher firm turnover are also more dynamic and fast-growing, flexible regulations can shift resources to these sectors away from more stagnant ones, with positive growth effects.⁴¹ However, it is important to recognise that flexible regulations can also promote sectors with high turnover that lack dynamism and have low productivity growth (e.g. hotels and restaurants).

Employment protection legislation – through its impact on hiring and firing costs – can also affect specialisation by reducing the ease of reallocating workers across firms and sectors, with adverse productivity effects. However, employment regulations, by reducing (involuntary) labour turnover, can also enhance an individual's incentive to invest in firm-specific human and social capital⁴² and thereby raise a firm's productivity growth. Recent studies emphasise that, *ceteris paribus*, industries that naturally require greater job reallocation grow faster (and account for a greater share of GDP) in countries with easier labour market regulations,⁴³ a prediction that is supported by available empirical evidence.⁴⁴ New estimates suggest that

36. Rajan and Zingales (1998).

37. This change may seem small, but considering that the share of GDP, for example, of the electronics industry (which is highly dependent on external financing) is on average 1.5% across countries (Figure 18), the change is sizeable.

38. For example: Andrews and Cingano (2012); Barone and Cingano (2011).

39. Andrews and Cingano (2012).

40. Recent studies have found that stringent regulations reduce productivity growth – and more so for industries that require greater job-reallocation (e.g. Bassanini et al., 2009).

41. Andrews and Criscuolo (2013).

42. Dess and Shaw (2001).

43. Cunat and Melitz (2012).

easing labour market regulations (measured as OECD’s indicator of employment protection on regular contract) from the top quartile (e.g. South Korea) to the median (e.g. Norway) would increase the value-added share of industries with a structurally high job turnover by 0.15 percentage points. The overall effect of greater specialisation on growth in sectors with high job-turnover depends on the characteristics of these industries, with some of these industries being more likely to add to growth than others.

In order to reconcile efficient mobility in the labour market with income security for workers, employment-oriented social policies are key. As is emphasised in the *Restated OECD Jobs Strategy* relatively generous welfare benefits can be consistent with high employment rates and efficient worker allocation. But these benefits must be combined with mutual-obligations/activation policies which increase re-employment opportunities while mitigating the disincentive to work embodied in generous welfare systems. “Make work pay” measures may also be required to make sure that globalisation does not push low-skill workers into working poverty.

Improving logistics is key to GVC participation

Logistics efficiency reforms are now high on the agenda of policymakers, private firms, and international organisations. There is no single institutional arrangement for countries to implement logistics-related reforms. Policymaking is a responsibility shared among government agencies in charge of transportation policies, investment, commerce, industry, and customs and border management. No country has a ministry for logistics. Instead, an inclusive public-private framework is important for consistent implementation. Canada, China, Finland, Germany, Malaysia, and Morocco have all introduced councils or similar coordination mechanisms. Reforms in Indonesia have reduced the average amount of time a container spends in port (dwell time) and associated costs, and Morocco has likewise enjoyed gains in competitiveness through reform (Box 4).

The World Bank Group’s Logistics Performance Index (LPI) shows preconditions for efficient logistics.⁴⁵ All top performers have developed and maintained strong public-private partnership and dialogue; good co-operation between policymakers, practitioners, administrators, and academics; a comprehensive approach in the development of services, infrastructure, and efficient logistics, with consistent policies.

Trade liberalisation at the multilateral and regional levels

The argument made here regarding the role of trade policy should not be read to mean that trade agreements are no longer relevant. Quite to the contrary, these instruments can promote participation in GVCs in multiple ways.

One of the most important functions of trade agreements in the modern world economy is to provide anchors by which governments can ensure traders and investors that the steps they have taken to liberalize their economies will be permanent. Trade agreements, whether they are negotiated in bilateral, regional, plurilateral, or multilateral configurations, are a means by which the autonomous reforms that countries have already taken – or sometimes those reforms that are brought about by the commitments in the trade agreement – are transformed from potentially reversible policy decisions into solemn and enforceable treaty commitments. The importance of this anchoring was demonstrated by what *did not* happen in the financial crisis of 2008-2009, when commitments made in the WTO reinforced countries’ resolve not to backslide into self-defeating, 1930s-style protectionism.

44. Chor (2010); Kowalski (2011).

45. The eight main logistics challenges as examined in the LPI are physical infrastructure, information and communications technology, customs, integration of border management, quality of logistics services, regional facilitation and corridors, national data tools to measure logistics performance, and green logistics.

Box 4. Case studies in logistics reform: Indonesia and Morocco

Indonesian authorities have used data from the LPI to monitor performance and improve logistics, raising national awareness and jumpstarting projects to make the country's main port more efficient. Shortly after *Connecting to Compete 2007* was published, Indonesia launched an ambitious public-private dialogue on trade facilitation and logistics. The country prepared an action plan examining its costs of trading through ports and the unique logistics costs of a large archipelago. It used the domestic logistics costs component of the LPI to measure Ministry of Trade performance. After 2010 it used the overall LPI score.

In 2008, the World Bank Group suggested ways to improve operations at Tanjung Priok, which handles two-thirds of Indonesia's international trade and has seen a rapid rise in container traffic. A main goal of the port initiative is to reduce dwell time (the average time it takes containers to clear the port). In 2011, Tanjung Priok's dwell time was six days. That was slightly longer than Thailand's five days, and more than Malaysia's four days, but much longer than Singapore's one day. To reduce dwell time, the port operator raised storage fees to discourage shippers from leaving containers for long periods, and introduced a new information technology system to better monitor and direct port traffic. A scheduled expansion of the port is expected to double its container capacity by 2017.

Morocco's LPI rank jumped from 113 in 2007 to 50 in 2012, having implemented a comprehensive strategy to improve logistics and connectivity and take advantage of the country's proximity to Europe. Morocco combined border management reform with large physical investments in the Tangier-Med Port. This strategy aided the emergence of Morocco's just-in-time exports to Europe, especially textiles, electronics, and automotive components. Morocco's fast rise in the LPI highlights the payoffs of such a comprehensive approach. In 2011 Morocco established an agency for logistics development. Taking advantage of progress already achieved, the country is pursuing a policy to develop freight and logistics facilities and services that reach beyond its own economy to North Africa, Southern Europe, and West Africa.

Sources: World Bank, *Logistics Performance Index* (2012); Sandee, Oliver, and Salcedo (2012).

Trade agreements can also facilitate the formation of GVCs by aiming for the harmonisation of standards. When the costs of regulatory compliance become large enough they can reach a tipping point in which it is no longer profitable to operate a multi-stage GVCs. For example, costs associated with meeting regulatory requirements in automotive components and terminal telecommunications equipment among the United States, the United Kingdom, Germany, and Japan are reported to be large.⁴⁶ Thus, harmonisation and mutual recognition of standards creates opportunities to reduce trade costs so that firms and consumers can take better advantage of the economies of dispersed international production.⁴⁷

Some countries are pursuing unilateral liberalisation of NTMs. One way to do so is to conduct an inventory of NTMs with the aim to streamlining them, raising awareness and transparency and ensuring that they achieve their regulatory objectives without imposing undue burdens on international trade. Indonesia, Mexico, and Mauritius have pursued a variety of approaches to achieve this goal.⁴⁸ In Mauritius, for example, regulations prohibit the importation of certain toxic ingredients used in paint, so that domestic paint producers face additional costs of 2-40% of the value of the paint to use alternative ingredients. At the same time, imports of foreign paint using the same ingredients are not prohibited. The cost difference affects the competitiveness of Mauritian paint both in domestic and export markets. Depending on whether the purpose of the regulation is to protect final users of the paint or occupational safety of workers in paint factories, there may be scope to redesign the regulation so that there is a better match between regulatory objectives and the policy regime which is not trade-impeding. The Transparency-in-Trade programme pursued jointly by UNCTAD, World Bank, International Trade Centre and African Development Bank is designed to help developing countries, among other things, to create their own NTMs databases as an efficient tool in dealing with NTMs both at home and abroad.

46. Henson et al. (2000). See also Yi (2003).

47. Portugal-Perez, Reyes and Wilson (2010); Swann (2010).

48. Cadot, Malouche, and Sáez (2012).

Any discussion of recent trends in trade negotiations must acknowledge that ever since the current multilateral system took shape in 1995, when the WTO formally came into being, most progress in trade liberalisation has been achieved bilaterally and regionally given that the Doha Round remains uncompleted. There have, however, been recent signs that the multilateral trade system can deliver following the trade facilitation agreement reached last year as well as the decision to agree on a work program for the Doha Round by the end of 2014. This presents an important opportunity to restore momentum to the WTO including its role *vis-à-vis* growing regional and bilateral activity. Multilateral solutions remain the first best option if they can be delivered in a reasonable time-frame. The lack of progress multilaterally has, however, been a factor in the proliferation of RTAs both in raw numbers and in their ambitions.

The mega-regional negotiations now underway between major partners in the Atlantic and the Pacific basins renew the perennial debate over whether RTAs support or threaten the multilateral trading system. That is far too large a question to be taken up in the present analysis, but we may nonetheless note that the negotiation of RTAs can both complement and coincide with the forging of GVCs. These agreements can offer a means by which partner countries may not only reduce or eliminate their remaining tariff barriers, but also address other, more complex issues that affect the formation and conduct of value chains. These include such matters as liberalisation of trade in services, especially in sectors that directly affect GVCs (e.g. transportation, telecommunications, and other infrastructure); convergence and mutual recognition of regulatory regimes; rules providing for greater transparency and non-discrimination; national treatment for FDI; and access to dispute-settlement mechanisms, including investor-state disputes. Care nevertheless needs to be taken as competing rules on these and other issues can detract from the value of such RTAs – and lend support to multilateral solutions still being the optimal approach. Trade agreements have the largest impact if they have broad participation and cover as many dimensions of GVCs as possible. The elimination of tariffs is a good starting point for creating new trade opportunities, but GVCs also require efficient services and the possibility of free movement of people, capital and technology across borders.

In recent times there has been increasing discussion about the extent to which RTAs may have the potential to set important precedents that are later taken up in the multilateral system. This includes going beyond the simple commitments on market access that have long been the focus of trade agreements at both the multilateral and regional level, and taking on more complex matters of governance such as transparency and regulatory convergence (OECD, 2014). The extent to which this may be an option is not clear as there is a diversity of views on whether such an approach presents a viable path forward. Decades ago NAFTA and the European Union advanced agreements on trade in services before the topic was taken up at the multilateral level, and today RTAs are taking up issues beyond the current WTO agenda on topics such as, for instance, investment and competition policy. This is the context in which this discussion is taking place. The picture that emerges is becoming increasingly complex and will require research and analysis as the trade negotiating environment evolves over the next few years.

Trade facilitation and aid for trade

A substantial amount of the cost of traded goods involves the operation of supply chains, and it follows that reductions in these costs should facilitate the creation and profitable operation of GVCs. The successful conclusion of the WTO Trade Facilitation Agreement in December 2013, as well as complementary reforms at the national level and in RTAs, are thus critically important.

Trade facilitation help countries participate in GVCs by cutting costs, increasing speed, and reducing uncertainty. In the Philippines and Indonesia, for example, reforms in border agency co-operation rendered clearance processes less opaque, enabling traders to plan more confidently, supporting just-in-time processes and reducing costs associated with uncertainty.

The economic gains from trade facilitation are substantial. OECD has developed a set of trade facilitation indicators that identify areas for action and enable the potential impact of reforms to be assessed. These indicators cover the full spectrum of border procedures, from advance rulings to transit guarantees, for 133 countries across income levels, geographical regions and development stages. Analysis shows that trade

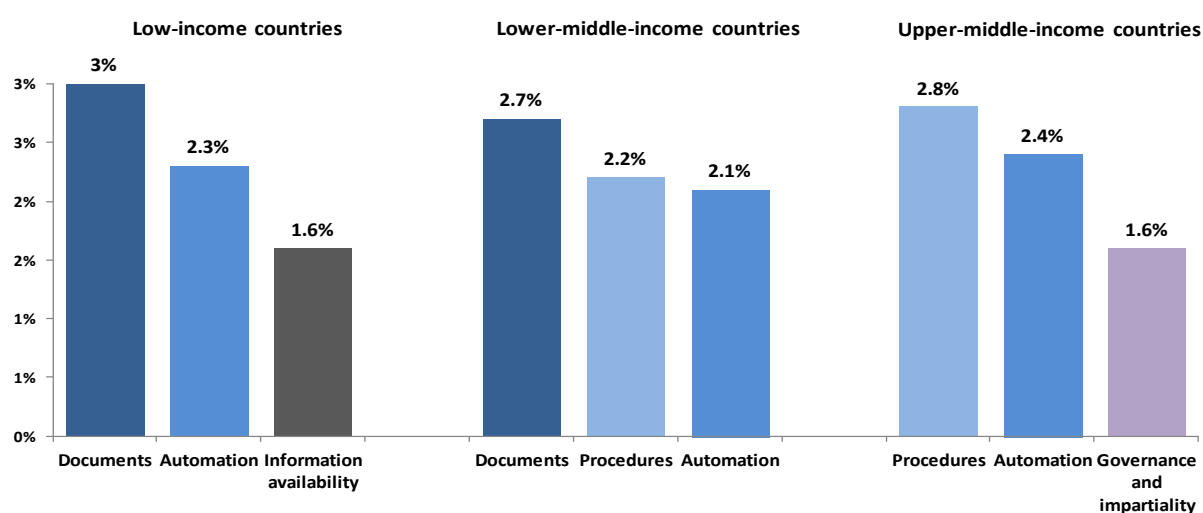
facilitation measures can benefit all countries in their role as exporters as well as importers, allowing better access to inputs for production and greater participation in GVCs.

Analysis of the indicators also shows that comprehensive trade facilitation reform is more effective than isolated or piecemeal measures (Figure 14). The potential reduction in trade costs of all the trade facilitation measures adds up to almost 15% for low-income countries, 16% for lower-middle-income countries, 13% for upper-middle-income countries, and 10% for OECD countries.

An analysis commissioned by the World Economic Forum found that reducing two kinds of supply chain barriers – border administration, and infrastructure and services related to transport and communications – could lead to global income gains six times larger than those available through the elimination of import duties worldwide. A reform in which all countries reduced these barriers halfway to global best practice (Singapore) could increase global exports by 9.4% and global GDP by 3.0%.⁴⁹ This is a conservative estimate that does not include potential benefits from other aspects of trade facilitation (e.g. improvements in market access and the business environment).

Although a new UNCTAD Study (UNCTAD 2014) estimates that less than 50% of the trade facilitation measures included in the Bali TFA are currently fully implemented in the reviewed countries,⁵⁰ a great majority of the trade facilitation measures in both LDCs and non-LDCs studied have already reached partial implementation. The results of the study suggest a correlation between the level of development and the level of implementation of the trade facilitation measures, though this is particularly true with respect to more challenging and demanding measures, such as single windows or authorized operators, where the level of implementation is clearly lower in LDCs than in non-LDCs. Findings from the OECD Trade Facilitation Indicators show that progress in other measures, such as separation of release from clearance, acceptance of copies or use of customs brokers appear unrelated to income levels.

Figure 14. Trade facilitation measures: Potential cost reduction in goods trade (%),



Source: OECD (2013a).

49. WEF (2013).

50. Based on the findings of 26 national implementation plans prepared as part of UNCTAD's technical assistance programme on trade facilitation.

Table 2. Estimated benefits for G20 countries from trade facilitation

Percentage changes from a 2007 baseline

	Volume of non-oil and gas exports	Volume of non-oil and gas imports	Gross Domestic Product
Argentina	22	40	8
Australia	5	5	3
Brazil	37	99	6
Canada	7	7	5
China	53	65	10
France	10	9	4
Germany	2	7	5
India	90	64	10
Indonesia	36	50	8
Italy	34	43	6
Japan	12	9	2
Korea	15	17	6
Mexico	14	32	7
Russia	111	40	8
Saudi Arabia	30	7	5
South Africa	22	59	10
Turkey	29	42	8
United Kingdom	-9	3	3
United States	23	13	3
All Other EU-28	14	15	9

Source: Tsigas and Ferrantino, "Modeling the Benefits of Trade Facilitation for the G2," *USITC Working Paper* (forthcoming 2014).

Both the UNCTAD and the OECD studies show that customs-related processes, such as measures on option to return rejected goods to the exporter, temporary admission of goods, inward and outward processing, declaration of transhipped or in transit goods and common border procedures and requirements, have the highest implementation rate, thanks to significant reform efforts by customs agencies around the world. On the other hand, the level of implementation is lower as regards other border agencies or relating to cross-sectoral or cross-agency measures, such as single window, enquiry points, disciplines on fees and charges, together with some advanced customs techniques, such as advance rulings, where gaps remain in terms of the required level of inter-agency cooperation and the effectiveness of the existing institutional, legal and regulatory frameworks.

The original WEF study did not report results for most of the G20 countries individually. New estimates carried out for this report, using the WEF model, considers a scenario in which the G20 countries simultaneously improve their supply chain performance halfway to global best practice. In this scenario, the estimated increase in global GDP is USD 2.5 trillion dollars (5.1% of the GDP of the G20 countries), when measured against a 2007 baseline.⁵¹ The results, as shown in Table 2, suggest that all G20 countries would

51. In the original WEF model, the estimated change in GDP for the whole world moving halfway to global best practice (not just the G20) was USD 2.6 trillion (4.7%). The main difference between this scenario and the

enjoy substantial gains in GDP and, in most cases, trade, from trade facilitation. Note that each country benefits not only from improving its own supply chain conditions, but from the reforms of its partners acting in concert. The projected results for some countries – see, for example, Argentina, China, India, Indonesia, Russia, South Africa, Turkey and the non-G20 EU (largely Eastern Europe) – are especially impressive.

GVCs may also benefit from well-targeted assistance under the rubric of Aid for Trade. Aid and other forms of development finance can promote value chain participation with investments in trade facilitation, infrastructure, and private sector development. Aid flows to these areas have increased in recent years, but the financial crisis and subsequent economic challenges faced by OECD member countries have put pressure on aid budgets. While support to economic infrastructure declined, the rise in aid for building productive capacity in 2011 to USD 18 billion indicates the increasing priority donors attach to private sector development as an engine of growth (commitments to agriculture, industry, and business services rose by a total of 10%). In conjunction, funding for programmes with a trade expansion objective doubled between 2007 and 2011, reaching USD 5.4 billion. Aid-for-trade facilitation has increased substantially since 2002, and annual commitments of almost USD 400 million will support the implementation of the Bali agreement.

National single-window programmes

Delays at customs are problematic in many developing countries. They add to the time and unpredictability of trading, inhibit export competitiveness, and discourage participation in GVCs. One innovative approach to border processing and clearance is the establishment of National Single Window systems.⁵² Such systems allow traders to submit all information required by regulatory agencies via a single electronic gateway instead of submitting separate information to multiple government entities using a variety of paper, electronic, or other interfaces. Establishing a single window involves significant challenges and complexity, requiring as it does the co-operation of multiple government agencies, many of which must engage in significant institutional reform. Recent World Bank experience suggests that a number of critical preconditions need to be in place to launch a single window program, including building a strong business case, careful assessment of risks and capabilities, a strong government mandate supported by political will and stakeholder buy-in, agreement among government agencies on the structure of governance and leadership, and a work program with key milestones linked to appropriate resources and accountability for all participants.

Even the poorest countries can make progress in this area in the presence of government commitment. A good example is the World Bank Group's work in the Lao People's Democratic Republic. With support provided by the World Bank and other donors, the government developed a National Trade Facilitation Strategy and established a National Trade Facilitation Secretariat to provide for the implementation of the strategy. Lao PDR established a "Trade Information Portal" that allows traders to access all relevant trade rules, regulations, procedures, fee schedules and forms from all border management agencies through a single, user-friendly website. The Trade Information Portal is an important first step in establishing a full electronic single window system. The World Bank Group is currently engaged in a preparatory project to support Laos in making informed decisions going forward with regard to the single window system. This project includes technical support on legal and regulatory frameworks, fee models and governance structures, as well as development of a comprehensive capacity-building and transition strategy.

The Philippines offers useful examples of how countries may innovate in border agency co-operation. In 2010 and 2011, the government developed and began to implement a national single window system for trade. The system has already automated 33 government agencies' import and export permit and licensing requirements. Many of those agencies did not have automated back-office functions until 2011, but all are now connected to the system, and more than 80 paper-based processes are being fully automated. Traders can

original WEF model is that the rest of the world (non-G20) is not assumed to improve its supply chain barriers.

52. McLinden (2013).

access the system online – first to submit and pay for permit applications, and then to track approval and clearance. Key performance indicators show that the system has reduced the time it takes traders to apply for and be granted various permits and licenses. Customs now hosts the national single window system’s information and communications technology infrastructure. The system’s design and development involved both public and private stakeholders. The Philippines thus improved its border management substantially, and did so without resorting to expensive, likely disruptive, organisational restructuring.

Social and environmental policy

The lines that separate economic, social and foreign policy are not always clear, and GVCs can blur them even further. This is partly a matter of avoiding risk: if for no other reason than its impact on business, governments would do well to adopt policies that do not sully their reputations. In a time when consumers are increasingly concerned over the social and environmental impact of their purchasing decisions, countries and companies are likewise sensitive to the pitfalls of sourcing or investing in markets that may be associated with the exploitation of workers, the violation of human rights, military aggression, or poor records of environmental protection (OECD, 2014f). Business should be conducted in a manner respectful of human rights and environment as prescribed by the OECD Guidelines for Multinational Enterprises, ILO and UN recognized standards.

Companies are increasingly considering sustainability performance as a strategic brand positioning issue, including not only local social and environmental aspects but also global environmental impacts such as life-cycle carbon emissions. Beyond the avoidance of social and environmental violations, governments should also consider the ways in which compliance with higher standards may enhance both their reputations and their attractiveness to potential traders and investors, including potentially attracting higher returns for local producers than would otherwise be the case.

This may be seen in the environmental field, where issues of “green trade” are rising in political and economic importance. One aspect of this concerns the global market for environmental goods and services which, is worth close to USD 1 trillion a year. Though trade in environmental goods, like trade in other goods, is affected by environmental standards and regulations at each link in its supply chains, demand for the final products is generally driven by environmental regulations and incentives in end-user markets.⁵³ Another important aspect is the “greening” of GVCs and the potential for GVCs to contribute to international environmental and social objectives through raising standards all the way up the chain.

The greening of GVCs requires traceability and transparency. The former is necessary to track hazardous products and materials, allocate responsibilities and monitor environmental compliance. The latter is a precondition for achieving credibility, legitimacy, and fairness (which preclude green-washing, for instance, or shifting polluting activities to developing countries). This means each firm or plant in a GVC should be gathering and sharing data about environmental risks and impacts.

One hurdle here is that environmental information may not be comparable across firms and countries. This challenge has led to the development and promotion of standards, such as the ISO 2009 and 14000 norms, on how to conduct life-cycle assessment and environmental audits. Governments and business associations can play a major role in improving the capacity for environmental information gathering and communication, both directly through research grants, and indirectly through environmental labelling, certification to standards required by national ecolabels or private labels such as the Forest Stewardship Council, and encouraging participation in programmes like the Global Reporting Initiative, the Toxic Release

53. Liberalising trade in environmental goods and services has been an objective of the WTO’s Doha Round of multilateral trade negotiations, a recent initiative among APEC economies, and a coalition of WTO members seeking to forge a plurilateral agreement on environmental goods. See the “Joint Statement Regarding Trade in Environmental Goods, 24 January 2014, at Davos, Switzerland” (www.ustr.gov/sites/default/files/EGs-Announcement-joint-statement-012414-FINAL.pdf).

Inventory in the United States, and the Regulation, and Evaluation and Authorisation of Chemicals in the European Union.

Further research on GVCs

A final area where governments can help to promote GVCs, acting both on their own and together, is in conducting research regarding the formation, conduct, and consequences of these GVCs. Whether this is done through academic institutions that receive state support, through government research agencies, in international organisations, or in regional and multilateral development banks, the investigation of GVCs can bring forward new and important insights that can aid governments in designing and executing best practices. The Initiative for Policy Dialogue on GVCs, Production Transformation and Development, launched by the OECD in 2013, promotes knowledge-sharing and peer learning between OECD and non-OECD economies to identify good practices, increasing policy impact and promoting the implementation of globally beneficial strategies, while at the same time fulfilling each country's priorities and development visions.

The state of research in this area is already advanced, as demonstrated by such projects as the joint OECD-WTO Trade in Value-Added (TiVA) initiative. Work is currently underway to increase the geographical coverage of the TiVA database, improve its timeliness, and deepen the industry detail. One of the biggest challenges in producing TiVA estimates is the reconciliation and completeness of international bilateral trade statistics, where inconsistencies have existed for decades and where complexities have grown. That work has already produced well-developed indicators on innovation and extensive experience in conducting country-level reviews of innovation policy, in both advanced and emerging economies.

The evidence-based research conducted thus far has been valuable, as should be evident from the summary given in the present report, but it is clear that more analysis is required. Further work is especially needed on jobs and skills, economic development through GVC upgrading, and the link between GVCs and international investment. Much still needs to be done even on some foundational issues. Empirical evidence on the impact of GVCs on the number and skills-level of domestic employment remains sparse, for example, due to the limited availability of international comparable data on skills.

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