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## INTERCONNECTED ECONOMIES: BENEFITING FROM GLOBAL VALUE CHAINS

# **Interconnected Economies: Benefiting From Global Value Chains**



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## **INTERCONNECTED ECONOMIES: BENEFITING FROM GLOBAL VALUE CHAINS**

The international fragmentation of production in global value chains (GVCs), driven by technological progress, cost, access to resources and markets, and trade policy reforms, challenges the way we look at the global economy. It is essential to understand how global value chains work, how they affect economic performance, and how policy can help countries derive benefits from their participation in global value chains. This report sets out the main evidence and policy implications of the OECD's work on global value chains, drawing on the OECD-WTO work on measuring Trade in Value Added. The policy implications include trade policy, as the emergence of GVCs calls for a reassessment of a range of trade policies, but also investment policies, innovation policies, and framework and structural policies that affect how, and to what extent, countries, including emerging and developing economies, can benefit from participation in global value chains. Drawing on inputs from across the OECD Secretariat, the work summarised in this Synthesis report aims to provide evidence of the role of value chains in the global economy; and to improve understanding of current and emerging policy challenges. The key policy messages of the report are set out below.

### **Key policy messages**

#### ***GVCs and trade policy***

- With the growth of global value chains (GVCs), economies are more interconnected, and they are increasingly specialised in specific activities and stages of value chains rather than in industries. Trade in GVCs therefore involves extensive flows of intermediate goods and services.
- GVCs are a powerful driver of growth and productivity and support job creation. Certain jobs and skills categories may be affected by trade in GVCs, however, and could be offshored.
- Imports are essential for exports, especially in complex value chains such as transport and electronics. In GVCs, tariffs and non-tariff barriers are effectively a tax on exports. Export restrictions can also affect the efficient functioning of GVCs and raise costs. The negative effects of trade protection are compounded in GVCs when parts and components cross borders many times.
- Trade-facilitating measures, such as fast and efficient port and custom procedures, permit the smooth operation of value chains that require goods to cross borders many times. Convergence of standards and certification requirements and mutual recognition agreements can help alleviate burdens on exporting firms.
- Services, such as business services, transport and logistics, account for over half of value creation in GVCs in many OECD countries and over 30% in China. Regulatory reforms and liberalisation of services trade, including through commercial presence as well as investment in services are essential to enhance competition and increase the productivity and quality of services.
- GVCs strengthen the economic case for advancing trade negotiations at the multilateral level, as barriers between third countries upstream or downstream matter as much as barriers in direct trading partners and are best addressed together.

- Trade agreements have the largest impact if they cover as many dimensions of GVCs as possible. While abolishing tariffs is a starting point for creating new trade opportunities, the value chain also requires efficient services and the possibility to move people, capital and technology across borders.

### ***Investment policy***

- Given the important role of MNEs in GVCs, lowering investment barriers is an efficient way for a country to become integrated in GVCs. By inhibiting the efficient functioning of GVCs, impediments to cross-border investment can have negative welfare impacts beyond the home and host country.
- The current international investment regime built on thousands of bilateral and regional investment agreements does not adequately reflect the interconnected nature of economies in GVCs. Multilateral co-operation and co-ordination, such as the OECD Policy Framework for Investment and the OECD Codes of Liberalisation, are needed to maintain the open and predictable international investment climate that has supported international investment in GVCs.
- To realise the full benefits of international investment, investment promotion and facilitation policies need to focus more closely on the activities undertaken in GVCs rather than on industries. These policies must recognise that success in GVCs depends on both inward and outward investment. Governments should avoid incentive wars to attract high-value stages of a GVC and should work together to ensure that the multilateral investment system continues to support growth.
- Large MNEs, including in some cases state-owned enterprises (SOEs) are prominent players in GVCs. This has raised policy concerns, for example about the effects on competition and markets further downstream.
- GVCs can support the spread of ideas on responsible business conduct. The *OECD Guidelines for Multinational Enterprises* and implementation tools such as the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas are policy instruments for promoting responsible business in GVCs.

### ***Benefiting from global value chains for growth and development***

- Through access to networks, global markets, capital, knowledge and technology, integration in a GVC can be a first step to economic development. This is often easier than building a complete value chain. Developing economies can enter GVCs by opening their markets to trade and FDI, improving their business environment, and strengthening domestic capabilities to engage in international trade.
- To strengthen the benefits that countries, including developing economies, obtain from participating in GVCs, governments will need to support the upgrading process by strengthening the business environment, supporting investment in knowledge assets such as R&D and design, and fostering the development of important economic competencies, notably skills and management.
- Since GVCs involve activities contracted within and between MNEs and independent suppliers, the ability to enforce contracts is crucial. Countries with sound legal systems tend to export more in more complex industries. Tasks that require more complex contracts (e.g. R&D, design, branding, etc.) are also more easily carried out in countries with well-functioning contractual institutions.
- Many low-income countries remain excluded from GVCs, due to a lack of natural resources to facilitate insertion in GVCs, lack of the necessary infrastructure, or a business environment that does not provide some of the necessary preconditions for investment. In some cases, these constraints can be overcome through capacity building. This may be difficult for the poorest developing economies, which would benefit from donor support through “aid for trade” initiatives.

### ***Competitiveness in GVCs***

- Today, success in international markets depends as much on the capacity to import high-quality inputs as on the capacity to export. Outsourcing and offshoring enhance export competitiveness in GVCs, by providing access to cheaper, more differentiated, and better quality inputs.
- Small and medium-sized enterprises (SMEs) play an important role in niche areas of GVCs and contribute indirectly to the exports of larger firms. Governments can support the participation of SMEs in GVCs by encouraging the development of linkages with international firms, fostering their supply capacity and ability to innovate, and facilitating the adoption of product standards.
- The manufacture of goods remains a core activity in GVCs, even if much value creation now involves services. Governments in advanced economies can help anchor production and value creation by supporting investment in skills and advanced manufacturing technologies, including in traditional industries, and through policies that strengthen networks and co-operation.
- Old-style support policies are not the answer to the decline of the manufacturing sector in advanced economies, as they ignore the interconnected nature of production in GVCs and the need for international competition and openness. Moreover, they raise risks of protectionism.
- Competitiveness in GVCs requires strengthening factors of production that are “sticky” and unlikely to cross national borders. This implies investment in people, education, skills and high-quality infrastructure and encouragement of strong industry-university linkages and other tacit knowledge. The quality of institutions and government are also important – long term – factors in firms’ decisions to invest and engage in economic activities in a country.
- Today, “what you do” (the activities a firm or country is involved in) matters more for growth and employment than “what you sell” (the products that make up final sales or exports).

### ***Adjusting to GVCs and addressing risks***

- International competition in GVCs will entail adjustment costs, as some activities grow and others decline and as activities are relocated across countries. Policy needs to facilitate the adjustment process through well-designed labour market and social policies and through investment in education and skills. Structural policies also help strengthen the flexibility of economies and their resilience against future shocks.
- The growing interconnectedness of economies in GVCs is a source of resilience. It can also lead to contagion if events in one part of the GVC feed through the entire system. While firms have the first responsibility to address potential risks in GVCs, a multi-stakeholder approach that involves governments is needed to support information sharing and capability building.
- Greater international co-operation will increasingly be needed to help reconcile national policies with the global nature of economic activity. Given the broad welfare implications of GVCs, governments, enterprises and other stakeholders need to remain mindful of their respective roles and responsibilities with respect to the governance of GVCs.
- Informed policies require good data and analysis. Further work is required to measure the role of investment in GVCs, and the impacts of GVCs on employment, skills and incomes.

## 1. GLOBAL VALUE CHAINS – EVIDENCE AND IMPACTS

### What are global value chains?

*A global value chain involves all the activities that firms engage in, at home or abroad, to bring a product to the market, from conception to final use.*

World trade, investment and production are increasingly organised around global value chains (GVCs). A value chain is the full range of activities that firms engage in to bring a product to the market, from conception to final use. Such activities range from design, production, marketing, logistics and distribution to support to the final customer. They may be performed by the same firm or shared among several firms. As they have spread, value chains have become increasingly global. GVCs draw on some basic characteristics of today's global economy:

- *The growing interconnectedness of economies.* In GVCs economic activities are fragmented and dispersed across countries. Today, more than half of the world's manufacturing imports are intermediate goods (primary goods, parts and components, and semi-finished products), and more than 70% of the world's services imports are intermediate services, such as business services. Exports increasingly include value added imported from abroad.
- *Specialisation of firms and countries in tasks and business functions.* Today, most goods and a growing share of services are “made in the world”, with different firms and countries specialising in the specific functions and tasks that collectively constitute a GVC. However, many policies are still based on the assumption that goods and services are produced in just one country.
- *Networks of global buyers and suppliers.* In GVCs firms control and co-ordinate activities in networks of buyers and suppliers, and multinational enterprises (MNEs) play a central role. Policy affects how these networks are formed and where their activities are located.
- *New drivers of economic performance.* In GVCs, trade and growth rely on the efficient sourcing of inputs abroad, as well as on access to final producers and consumers abroad. The fragmentation of production in GVCs is a means of increasing productivity and competitiveness. GVCs also affect the labour market, mainly by affecting demand for different skills groups.

*The emergence of global value chains has important policy implications.*

For all these reasons, it is essential to understand how global value chains work, how they affect economic performance, and how policy can help countries derive benefits from global value chains. This report sets out the main evidence and policy implications of the OECD's work on global value chains, drawing on the measurement of trade and production patterns in global value chains (Trade

in Value Added, see Box 1). The policy implications include trade policy, as the emergence of GVCs calls for a reassessment of a range of trade policies, but also investment policies, innovation policies, and framework and structural policies that affect how, and to what extent, countries, including emerging and developing economies, can benefit from participation in global value chains.

### **Why have global value chains emerged?**

*Technological advances have enabled the emergence of GVCs, ...*

The fragmentation of production across countries is not a new phenomenon. What is new is its increasing scale and scope. Firms today can disperse production across the world because trade costs have decreased significantly, mainly owing to technological advances. Cheaper and more reliable telecommunications, information management software and increasingly powerful personal computers have markedly lowered the cost of co-ordinating complex activities within and between companies over long distances. Rapid advances in information and communications technologies (ICT) have increased the tradability of many goods and services. Moreover, containerised shipping, standardisation, automation and greater inter-modality of freight have facilitated the movement of goods in GVCs, although distance still matters.

*...but liberalisation of trade and investment has also played a role.*

Trade liberalisation has resulted in falling trade barriers, in particular for tariffs, and has further reduced costs. Liberalisation of investment has allowed firms to disperse their activities, and liberalisation in emerging economies has helped to extend GVCs beyond industrialised countries. Regulatory reforms in key transport and infrastructure sectors, such as air transport, have also brought down costs.

*GVCs enable firms to become more efficient and benefit from economies of scale and scope.*

These developments have enabled companies to look at relative costs and factor endowments and build an efficient value chain across firms and locations. Sourcing inputs from low-cost or more efficient producers, domestically or internationally, and within or beyond the firm's boundaries, can mean important cost advantages. Outsourcing production also enables firms to benefit from the economies of scale and scope that specialised suppliers can provide.

*Access to foreign markets is another motivation, ...*

However, the spread of GVCs is not driven by cost and efficiency considerations only. Another important motivation is access to foreign markets. Demographic shifts and rapid growth in several large non-OECD economies mean that an increasing amount of global economic activity is taking place outside the OECD area. If companies wish to benefit fully from these new growth centres, they need to be present, notably through distribution and production facilities, as local presence allows them to understand and exploit markets abroad. Increasing foreign presence does not necessarily involve the closure or physical offshoring of existing production from advanced economies, but does often imply the creation and expansion of affiliates abroad.

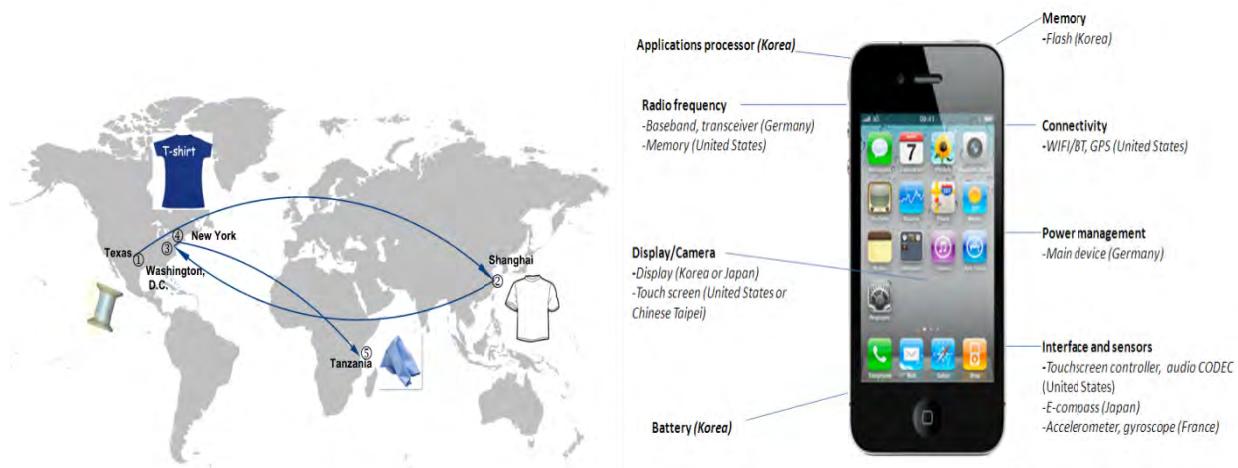
*..., as is access to knowledge.*

Another motivation for the spread of GVCs is access to knowledge. Companies increasingly make investments abroad to gain access to strategic knowledge assets, whether these are skilled workers, universities, research centres or other sources of expertise. Proximity to competitors and suppliers is another factor in the growth of GVCs, as it enables firms to learn from others and facilitates collaboration.

*GVCs differ depending on the product, ...*

Figure 1 illustrates GVCs for two goods: a T-shirt and a smartphone. Cotton grown in the United States is exported to China for the manufacturing of apparel, after which it re-enters the United States for imprinting with logos and graphics and for sale in wholesale and retail markets. In some cases the (used) T-shirt is later exported to Tanzania for re-sale or shredded as furniture padding. The Apple iPhone shows the other end of the technology spectrum, with many complex components sourced from all over the world.

**Figure 1. Global Value Chains: from apparel to electronics**



Source: T-shirt example based on Rivoli (2009); iPhone 4 example based on analysis by IHS-Isuppli (the teardown takes into account only components and does not include other expenses such as manufacturing, software, royalties and licensing fees); map source: ARTICQUE© - all rights reserved;

*... with the level of fragmentation resulting from a trade-off between production and transaction costs.*

Figure 1 also shows that not all GVCs are equally complex or widespread. The level of fragmentation of production is linked to the technical characteristics of products and the costs incurred when production is split among different locations. Services, for example, are less likely to be divided up than manufactured products, in particular when they require face-to-face contact between the provider and the consumer. Moreover, the level of fragmentation depends on a trade-off between production and transactions costs. By locating stages of production in countries where production costs are lower, firms decrease the marginal cost of production. However, they also incur higher fixed and variable costs because of all the services needed to organise production across several locations. Changes in this trade-off may affect outsourcing decisions; for example, in recent years, several US firms have "back-shored" some of their activities to the US market as a result of rising costs in emerging economies, concerns about intellectual property, changing perceptions on the stability of GVCs, and a range of other factors. This trade-off will differ across countries, influenced by geography, culture and a range of policy settings.

### How are economies involved in value chains?

*Economies' participation in GVCs ...*

Economies are not all equally engaged in GVCs, just as they are not equally engaged in international trade. Economies participate in GVCs both as users of foreign inputs and as suppliers of intermediate goods and services that can be used in other economies' exports. An indicator that reflects both these elements – the so-called participation index – is shown in Figure 2.

*...depends on their size and openness.*

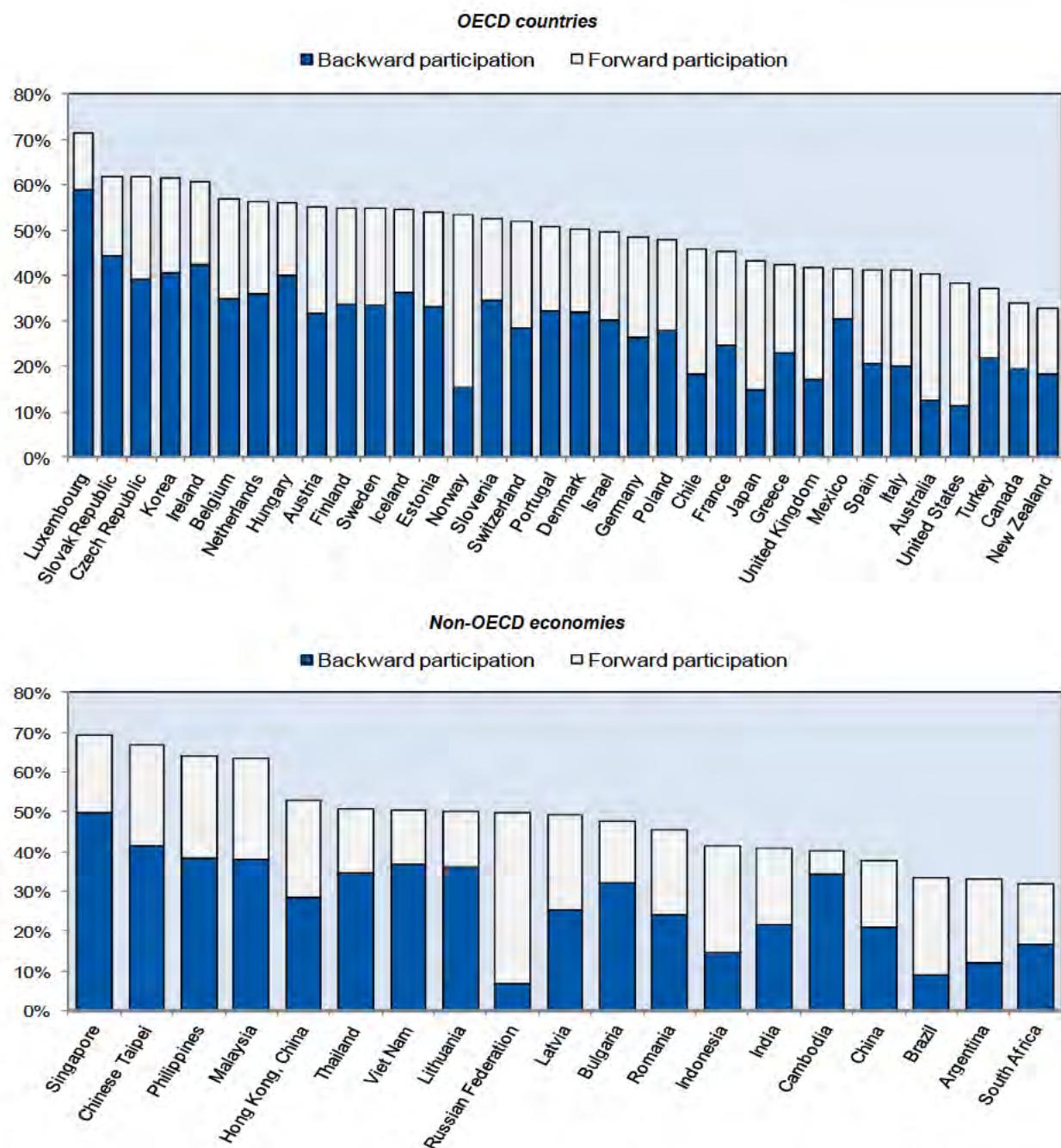
Small open economies such as Belgium, Luxembourg or the Slovak Republic source relatively more inputs from abroad and produce relatively more inputs for use in GVCs than large economies, such as Japan or the United States, or the European Union as a whole. In these, owing to the size of the economy, a larger share of the value chain is domestic. However, the participation index not only accounts for the use of foreign inputs (measured as the import content of exports or backward participation), but also accounts for the use of inputs in third countries. For example, the foreign content of US exports is about 15% but the United States' participation in GVCs rises to almost 40% when the use of US intermediate inputs in other economies' exports is taken into account. Distance to markets also affects participation in GVCs, as suggested by the example of New Zealand.

*Emerging economies play an important role in GVCs.*

The participation in GVCs of non-OECD economies is of a similar magnitude and follows a similar pattern. Large economies, such as Brazil, China and India, have a lower import content of exports than small economies such as Malaysia or Singapore. Data for the least developed countries are not yet available in the TiVA database. However, many of these economies are not yet as involved in global value chains as the emerging economies.

**Figure 2. Participation in GVCs, 2009<sup>1</sup>**

Foreign inputs and domestically produced inputs used in third economies' exports, as a share of gross exports (in %)



Source: Miroudot and De Backer (2013).

<sup>1</sup>

The statistical data for Israel in all the figures in this document are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

*Countries' location on value chains affects how much they benefit from participating.*

Countries also differ in where they are located in the value chain, depending on their specialisation. Countries upstream produce the raw materials or the knowledge (e.g. research, design) involved at the beginning of the production process, while countries downstream assemble processed products or specialise in customer services. These positions can change over time. Where a country is located in the value chain can affect the degree to which it benefits from participation in a GVC; some activities, such as research and development (R&D) and design, but also certain services, tend to create more value added than assembly, although this differs by industry.

*Both multinationals and small firms are involved, with important differences between chains that are buyer-driven ...*

Global value chains involve different types of firm: MNEs and their affiliates abroad as well as independent suppliers, including small and medium-sized enterprises (SMEs), in both domestic and foreign markets. Transactions in GVCs include arm's-length transactions between companies and independent suppliers as well as intra-firm transactions. Some chains are "buyer-driven" and have developed around large retailers such as Wal-Mart or highly successful brands such as Nike. Products in such chains are often relatively simple, e.g. apparel, housewares and toys; manufacturing such products requires relatively little capital and few skilled workers. Lead firms in these GVCs focus almost exclusively on marketing and sales. They have a limited number of factories of their own and source products from a large network of independent suppliers.

*... and those that are producer-driven and involve complex products.*

Producer-driven GVCs are typically found in high-technology sectors such as the semiconductor, electronics, automotive or pharmaceuticals industry. Because these industries rely on technology and R&D, large manufacturing firms such as GM, Sony and Apple control the design of products as well as most of the assembly, which is dispersed among different countries. Technology (including design, etc.) and production expertise are core competencies and are often developed by lead firms or captive suppliers that can be prevented from sharing technology with competitors. MNEs play a major role in these networks, including through their control of foreign affiliates.

*Small firms can exploit their flexibility and speed to tap into new opportunities in GVCs ...*

The fragmentation of production has created new opportunities for relatively small firms – including in developing and emerging economies – to enter global markets as components or services suppliers, without having to build a product's entire value chain. New niches for the supply of novel products and services continuously emerge and may allow SMEs to exploit their flexibility and speed. Certainly, the on-going fragmentation of production combined with the development of ICTs has created new entrepreneurial possibilities for SMEs. ICTs have eased access to markets beyond national borders and have led to a new category of micro-multinationals, i.e. small firms that develop global activities from their inception.

*... and contribute to the exports of multinational firms, ...*

*... although they typically face challenges for meeting the requirements of GVCs.*

### **Trade in value chains differs from regular trade and requires new measurement**

*Trade in value chains involves a high share of intermediate goods and services ...*

SMEs also play an important role in domestic value chains since they supply intermediates to exporting firms in their country. For example, surveys show that in 2010 the US parent enterprise of a typical US MNE bought more than USD 3 billion in inputs from more than 6 000 US SMEs (and this represented almost 25% of its total input purchases).

At the same time, most SMEs face serious challenges for participating in GVCs, especially in terms of managerial and financial resources and the ability to upgrade and protect in-house technology. They often lack the scale to invest in R&D, train personnel, or meet strict standards and quality requirements. Most final exports in value chains therefore come from a limited number of large exporters. Moreover, for small firms to upgrade in a value chain, they must typically undertake a more complex set of tasks. They may have to contribute to product development, to organise and monitor a network of sub-suppliers, to ensure compliance with a broader set of standards, or to ensure delivery and quality at competitive prices. Strengthening the engagement of SMEs in GVCs therefore remains an important policy challenge.

*... and value is sometimes returned to the home country.*

*Emerging empirical evidence on GVCs illustrates the degree of value creation in global chains.*

An important effect of the growth of GVCs is that trade and production patterns have become more complex. Intermediate inputs now account for the bulk of international transactions, both in goods and services. In most economies, around one-third of intermediate imports end up in exports. Not surprisingly, the smaller the economy, the higher the share, but even in the United States and Japan these shares are 17% and 22%, respectively, at the total economy level, with a higher incidence of intermediate imports in some highly integrated industries. In Japan, for example, nearly 40% of all intermediate imports of transport equipment end up in exports. In most other countries, the share of intermediate imports embodied in exports is significantly higher. In Hungary, for example, nearly two-thirds of all intermediate imports are destined for the export market after further processing, with the share reaching 85% for electronic intermediate imports. In China, Korea and Mexico, around three-quarters of all intermediate imports of electronics end up in exports.

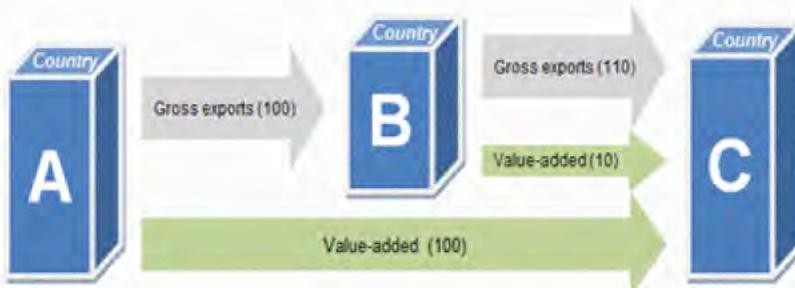
GVCs can become so complex that imports can also contain “returned” value added that originated in the importing country. In China, for example, nearly 7% of the total value of imported intermediate goods reflects value added that originated in China. For electronic goods, Chinese intermediate imports contain over 12% of “returned” Chinese domestic value added, and Korean intermediate imports contain close to 5% of “returned” Korean domestic value added.

Better empirical evidence documenting the rise of GVCs and its implications for trade has emerged only recently. The OECD's work, in co-operation with WTO, to measure trade in value added has extended the available evidence base, in particular on the role of trade in global value chains (Box 1). At the aggregate level, statistics on trade in value added provide a new perspective on the weight of economies in international trade, which differs from the view conveyed by gross trade statistics. For example, on the basis of the domestic value added embodied in exports, the United States was still the largest

exporting economy in 2009, which it was not on the basis of gross exports (Figure 3). Economies heavily engaged in global value chains, such as China, tend to have significantly lower shares of total exports based on domestic value added than they have in terms of gross exports. Economies such as the United States, Japan and the United Kingdom, but also the Russian Federation and Brazil, have higher shares based on domestic value added than on gross exports.

#### **Box 1. Measuring trade in value added**

The Trade in Value Added initiative factors out the double counting implicit in current gross flows of trade and instead measures the flows of value that is added (labour compensation, taxes and profits) by a country in the production of any good or service that is exported.



For example, country A exports USD 100 of goods, produced entirely within A, to country B, which further processes them before exporting them to C where they are consumed. B adds value of USD 10 to the goods and so exports USD 110 to C. Conventional measures of trade show total global exports and imports of USD 210 while only USD 110 of value added has been generated in their production. Conventional measures also show that C has a trade deficit of USD 110 with B, and no trade at all with A even though A is the chief beneficiary of C's consumption. If instead flows in value added are tracked, C's trade deficit with B drops to USD 10 and it now runs a deficit of USD 100 with A.

The OECD's indicators on trade in value added are based on this idea and are derived from a global input-output table, developed by the OECD, which describes interactions between industries and consumers for 58 economies and 95% of global output. The database aims to inform policy in a number of areas and to better reflect: a) the significant contribution made by services in global value chains; b) the important role of imports for export performance; c) the true nature of economic interdependencies as reflected in bilateral trade balances in value added terms; d) the role of emerging economies in GVCs; and e) the impact of supply and demand shocks on downstream and upstream production.

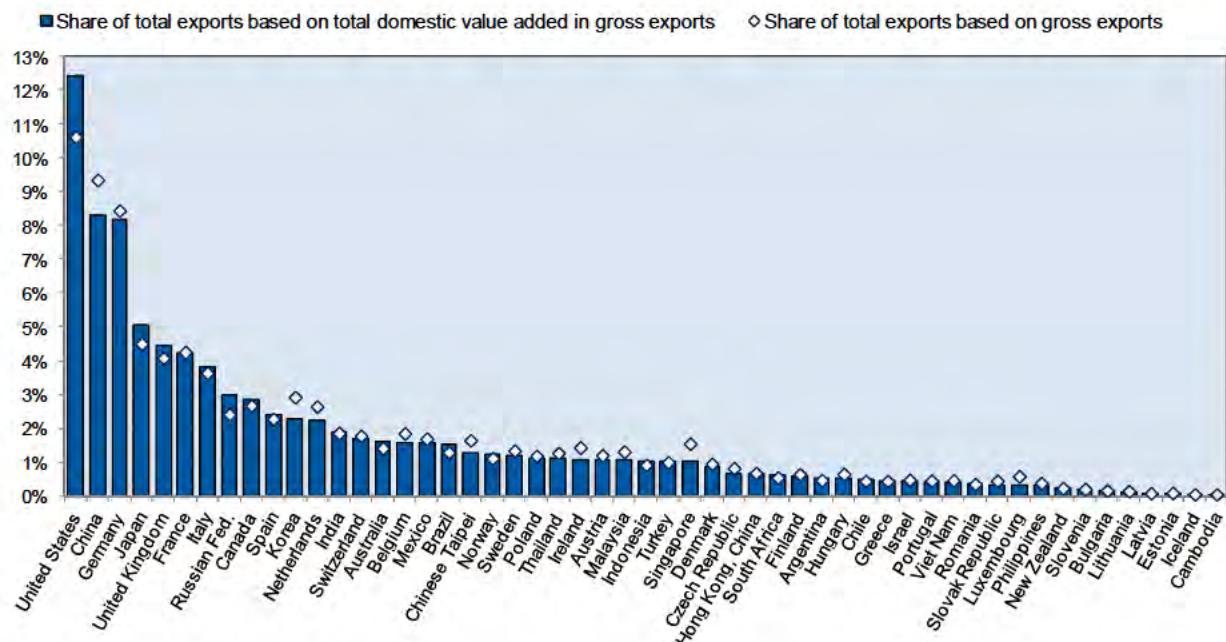
Indicators included in the database are: breakdowns of gross exports by industries into their domestic and foreign content (with the domestic content split into direct, indirect and re-imported components); the service content of gross exports by exporting industry (broken down by foreign/domestic origin); bilateral trade balances in value-added terms; and the percentage of intermediate imports embodied in exports, as a percentage of total intermediate imports.

An expansion in the number of economies and industry disaggregation is planned to reflect the 58 economies and 37 industries that are included in the OECD's input-output database. Work is also planned to extend the time period covered, with plans to go back to 1995 data. Moreover, the number of indicators and degree of detail presented will be further elaborated.

The origin of value added is only the beginning of the OECD's work in this area. Two other important areas are jobs and skills, for which indicators will soon begin to be rolled out for some countries. For income, work is under way to extend the accounting framework used for TiVA to explore how income (profits) generated from trade flows, and in particular income generated by knowledge-based assets, is further distributed among affiliate companies.

The TiVA Database can be accessed at OECD.Stat: <http://stats.oecd.org>. For more information on the methodology behind the TiVA Database and indicators see [www.oecd.org/trade/valueadded](http://www.oecd.org/trade/valueadded). Contact: [TIVAContact@oecd.org](mailto:TIVAContact@oecd.org).

**Figure 3. Shares in total exports of OECD and Key Partner economies, 2009**  
 Based on gross exports and on total domestic value added embodied in gross exports

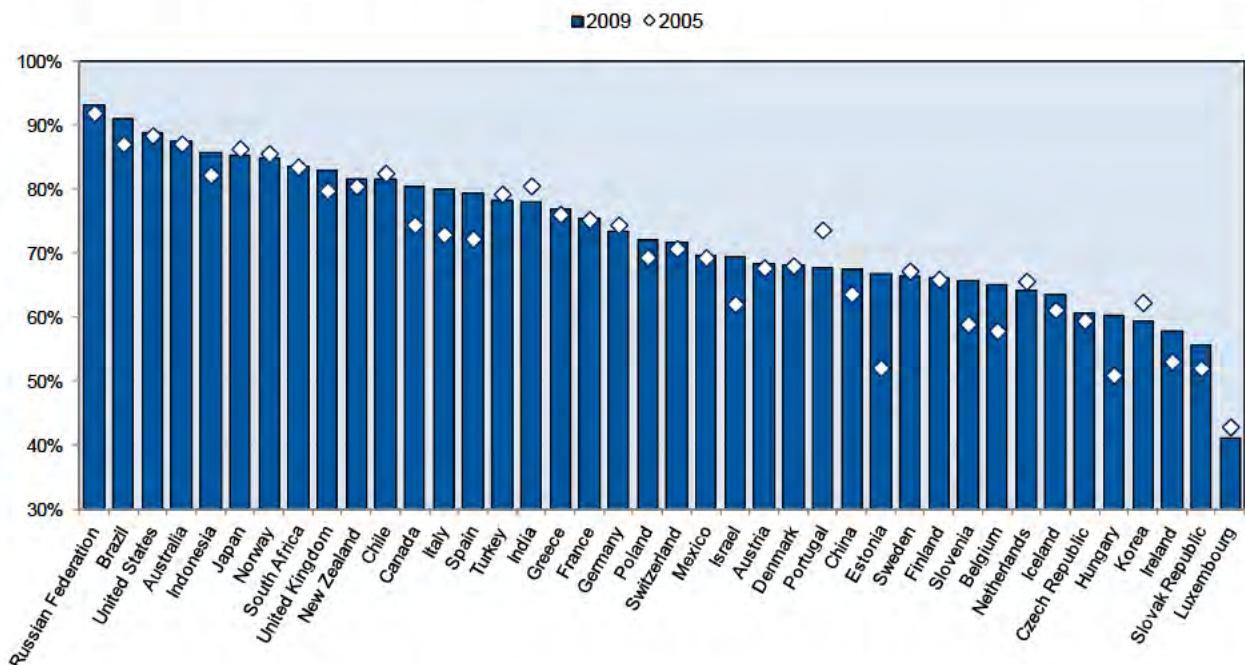


Source: OECD-WTO TiVA Database, April 2013.

*Large economies and exporters of natural resources have the highest ratio of domestic value added to exports.*

The differences between export shares based on gross flows and on value added flows reflect the ratio of domestic value added to gross exports or, conversely, the extent to which foreign value added is incorporated in gross exports. Most economies with a very high ratio of domestic value added to gross exports tend to be very large economies (including in geographical terms) or major exporters of natural resources, such as Australia or Norway (Figure 4). Economies with a low ratio are either very small economies, such as Iceland and Luxembourg, or economies that are heavily integrated into global value chains, such as several Central European economies, Ireland and Korea.

**Figure 4. Ratio of domestic value added to gross exports, OECD and Key Partner economies, 2005 and 2009**

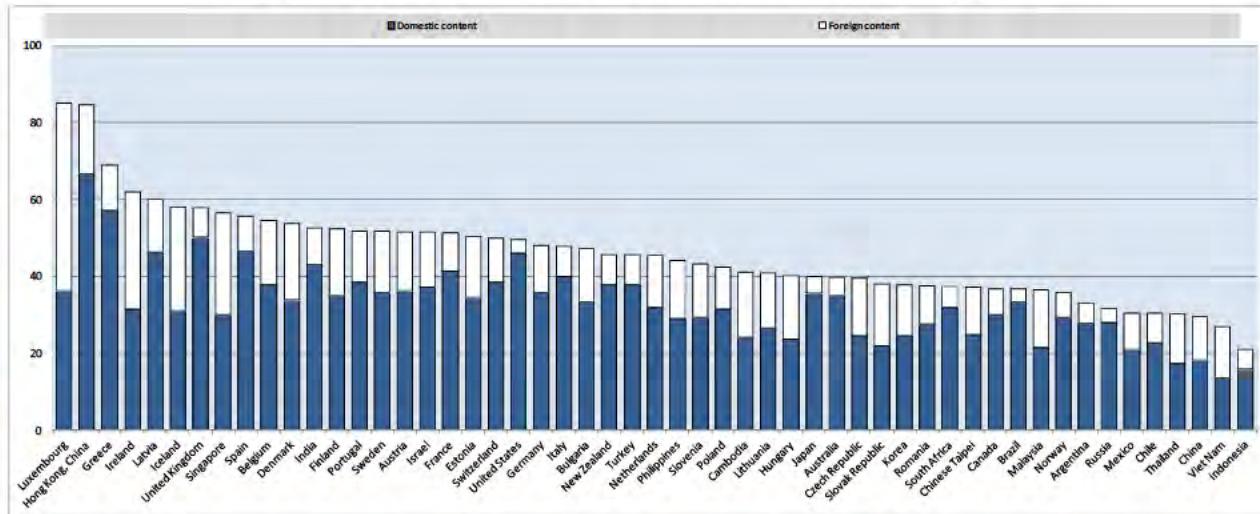


Source: OECD-WTO TIVA Database, April 2013.

*Services account for over half of the value created through international trade in several OECD countries and for nearly one-third in China.*

The data on trade in value added also highlight the importance of services. Services comprise about two-thirds of GDP in most developed economies. However, in terms of gross exports, services typically account for less than one-quarter of total trade in goods, but in terms of value added they contribute nearly or just over 50% in France, France, Germany, Italy, and the United States, almost 60% in the United Kingdom and nearly 30% in China (Figure 5). Luxembourg, Greece and Ireland have the highest shares of services in gross exports among the 40 countries shown in Figure 5. Countries that rely more on exports of natural resources, such as Brazil, Canada or the Russian Federation, and important manufacturing economies, such as Mexico, China or Korea, have a relatively low share of services value added in total exports. In most countries, the contribution of services increased over time. Services make a significant contribution (typically one-third) to all manufactured goods and are provided by both foreign and domestic service providers. In France, for example, over half of the domestic value added generated in producing transport equipment originates in the French services sector.

**Figure 5. Share of services value added in total gross exports, 2009**



Source: OECD-WTO TiVA Database, April 2013.

*Bilateral trade balance positions can change significantly when measured in value-added terms.*

Measuring trade in value added also changes bilateral trade balance positions, although the total trade balance is unaffected. China's bilateral trade surplus with the United States was over USD 60 billion (one-third) smaller in value added terms in 2009 for example than in gross terms. This partly reflects the higher share of US value-added imports in Chinese final demand but also the fact that a significant one-third of China's exports contains foreign content – the “Factory Asia” phenomenon. For example, significant exports of value added from Korea and Japan pass through China on their way to final consumers; this results in significantly smaller Chinese trade deficits with these countries but also typically higher Japanese and Korean trade surpluses with other countries. Similarly, Korea's significant trade deficit with Japan falls in value added terms.

*Imports are an essential input for exports, in particular in sectors such as transport equipment and electronics.*

The TiVA Database also demonstrates the importance of imports for exports. To improve productivity and remain competitive in a world dominated by GVCs, firms require efficient access to imports of intermediate goods and to services. For example, with the emergence of regional production hubs, between a third and half of the total value of exports of transport parts and equipment by most major producers originated abroad in 2009. In the United States and Japan, the shares were only about one-fifth, owing to their greater scope to source inputs domestically. However, this was also true for Italy, possibly because of efficient upstream domestic networks of SMEs. Interestingly, in 2009, Germany exported nearly 40% more than the United States in gross terms but only 10% more in value-added terms. Similar patterns exist in other sectors. In China and Korea, two of the world's largest exporters of electronic goods in 2009, the foreign content of exports of these products was about 40%. In Mexico, it was close to 60%. This shows that in GVCs, countries specialise in specific business functions and stages in the value chain, such as R&D, procurement, the manufacturing of parts and components, operations, marketing or customer services. Thus, China specialises in assembly operations and India in business services.

## **Global value chains strengthen productivity and growth**

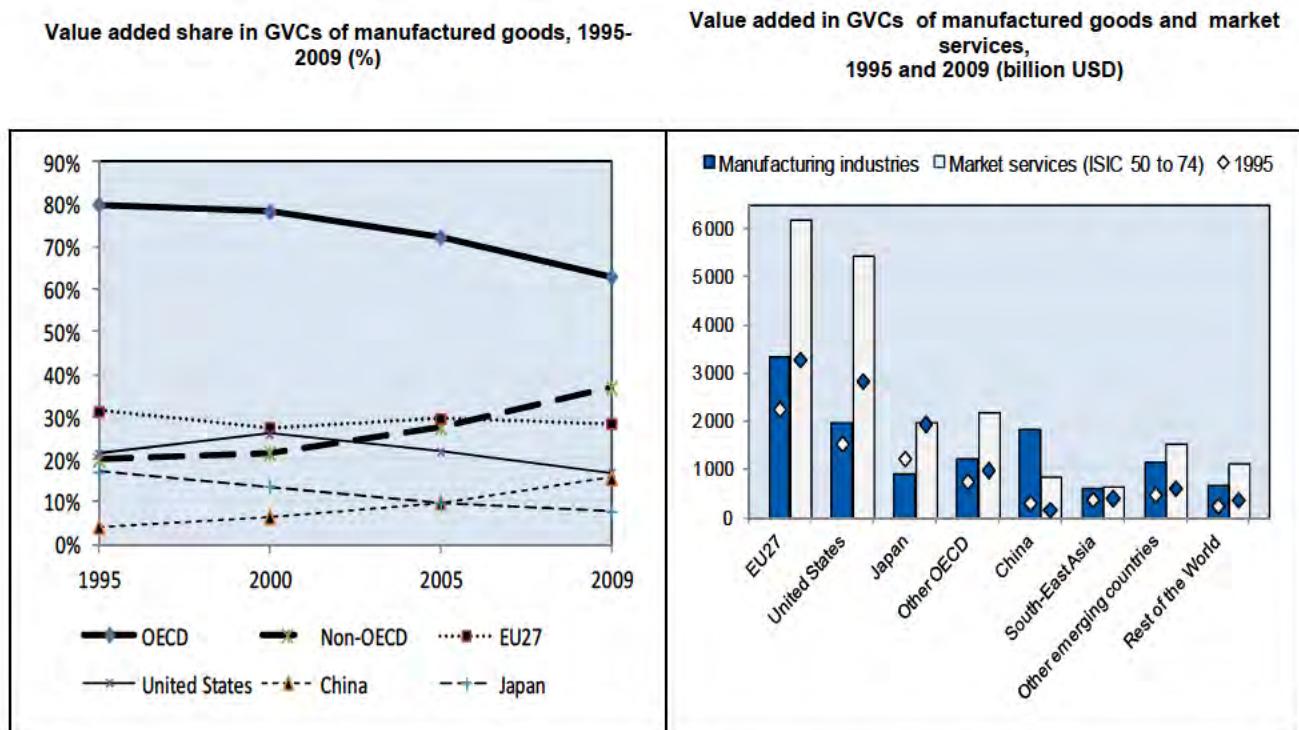
*GVCs require reconsideration of existing economic thinking on globalisation.*

The emergence of GVCs challenges some views on the economic impacts of globalisation but confirms others. For example, the (limited) available empirical evidence shows that labour-intensive tasks in GVCs take place primarily in emerging and developing economies with abundant labour, while knowledge-intensive activities are still concentrated in developed economies. This is consistent with theories of comparative advantage. Likewise, the impacts of GVCs on productivity and employment can be broadly understood in terms of existing trade models. Nevertheless, additional impacts of GVCs complement this view.

*Engagement in GVCs enhances productivity*  
...

Among the most important impacts of GVCs is their role in raising growth and productivity. The economic literature has long provided strong evidence that openness to international trade and investment can be an important driver of growth and productivity, although the impacts are often conditional on domestic economic conditions and policies. The impacts of globalisation on productivity are due to the efficiency-enhancing impacts of international competition, to access to foreign knowledge and technology, to scope for specialisation and economies of scale, etc. OECD calculations show that most world regions, including both OECD and emerging economies, have increased the value added they create and capture in GVCs of manufactured goods, although the share of OECD economies has declined over time (Figure 6). Both the EU and the United States increased their value added from manufacturing GVCs, but growth was strongest in market services. Japan's value added within manufacturing GVCs declined from 1995 to 2009, and its increase in market services was more modest than that of the EU and the United States. This was mainly due to slow growth in the domestic part of Japan's value chains.

**Figure 6. Value added by selected economies and regions in GVCs of manufactured goods and market services, world, 1995-2009**



Note: "Other emerging countries" includes Argentina, Brazil, India, the Russian Federation and South Africa; "Southeast Asia" includes Brunei, Cambodia, Chinese Taipei, Hong Kong (China), Indonesia, Malaysia, the Philippines, Singapore, Thailand and Viet Nam.

Source: OECD-WTO TIVA Database, April 2013.

*... in part by increasing access to cheaper or higher-quality intermediate inputs.*

In addition to these effects, participation in GVCs may increase productivity by facilitating access to cheaper or higher-quality intermediate inputs. Industries with a higher share of imported intermediate goods display on average higher productivity in OECD countries, as foreign inputs embody more productive technology and resources are re-allocated more efficiently. This is because of:

- A price effect: increased intermediate imports result in stronger competition between producers of intermediates and therefore lower the price of intermediates.
- A supply effect: increased imports enhance the variety of intermediates available.
- A productivity effect: new intermediate goods may be better suited to the technology of final goods producers and may spur innovation in the final goods sector by enhancing access to foreign knowledge.

*Engagement in GVCs does not appear to affect overall employment ...*

While the impacts of globalisation in general and GVCs in particular on productivity are relatively clear and well documented, they have more complex effects on employment that will require further analysis. A range of OECD work, including a 2012 report of the International Collaborative Initiative on Trade and Employment, has looked at the links between globalisation and employment. Overall, these studies show that economic globalisation has so far had little, if any, effect on total employment. Employment-population ratios

have risen and unemployment rates fallen in OECD countries over the past decades even as trade and foreign direct investment (FDI) have deepened, and the shift from manufacturing has been compensated by strong job growth in services. Significantly, aggregate employment performance is no worse in the OECD countries that are most open to trade or where trade openness has increased most rapidly. Likewise, there is no systematic association between cross-country differences in trade openness and unemployment rates. The general conclusion is that the overall employment level is determined by long-term growth in the labour force, macroeconomic variables and labour-market-related institutions rather than by globalisation.

*... but has implications for its composition, ...*

However, while aggregate employment may not be affected by globalisation, the composition of employment may be. The offshoring of certain production stages in a GVC typically involves the more labour-intensive processes, so that the corresponding employment will decline. But offshoring also raises the productivity and the competitiveness of remaining activities; this leads to employment growth and can offset the job losses due to offshoring. This process maintains the total level of employment, but changes its composition in terms of activities and skill categories, as the skill requirements for newly created jobs are often higher than those for the jobs lost. This may also have differentiated impacts at the local level.

*... with certain groups of workers more likely to be affected by offshoring and the automation of their tasks.*

There is evidence that GVCs do affect the position of the different skill groups. In the United States, during the 2000s, the share of medium-skilled workers declined, 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 workers. It is not clear whether these shifts are due to GVCs or technology. What is clear is that workers that perform manual or cognitive tasks that lend themselves to automation or codification (e.g. book-keeping, monitoring processes, processing information) are most likely to be affected by GVCs; many of these tasks can be offshored as services. However, such tasks may be complementary to those that cannot easily be digitised or offshored due to high transaction costs or the need for contact with customers. High-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 also be less affected by trade or technology. GVCs clearly contribute to the shifting demand for skills, but it is difficult to know how much is due to trade and how much to technology.

*Import competition puts downward pressure on wages ...*

Another important impact of globalisation and GVCs concerns wages and inequality. Recent OECD work estimates that, while other factors are the main drivers, at least 10% of the decline in the share of labour in national income is due to globalisation and in particular to the pressures arising from the relocation of parts of production in GVCs and from import competition from companies producing in countries with low labour costs. Increased (international) competition not only reduces the size of the rents that employers and workers share, but also decreases the bargaining power of workers.

*... but openness to trade and engagement in GVCs is associated with better working conditions.*

*The emergence of GVCs also affects the transition towards green growth.*

Working conditions are another labour market issue that has received growing attention because of GVCs. International competitive pressures might encourage countries to compete by reducing labour standards and working conditions. Such a “race to the bottom” does not seem to have materialised, however, though instances do appear from time to time. Instead, the evidence indicates that openness is associated with better working conditions; open economies have significantly better working conditions, – lower hours of work, fewer accidents, etc. – than closed economies. There is also some evidence that inferior working conditions may deter rather than attract investment by MNEs.

A final important dimension of global value chains is their potential contribution to sustainability and green growth. There are risks that – in a context of differences in environmental regulations and policies – relatively more polluting activities might be moved to locations with less stringent environmental regulation. OECD analysis suggests that this effect has thus far been relatively small. Moreover, such effects can be reduced through international agreements; the more countries participate, the smaller the “leakage” effect is likely to be. Several firms are already taking action to enhance the environmental performance of their value chain. Unilever, for example, made a commitment in 2010 to reduce the carbon footprint of its value chain by 50% by 2020. Such actions respond to growing consumer demand and policy pressure, but also reflect growing business interest in ensuring sustainable supplies of intermediate inputs and in protecting brands and reputation.

## 2. DERIVING THE BENEFITS – WHAT IMPLICATIONS FOR POLICY?

*Obtaining benefits from participating in GVCs requires a broad strategy, including openness to trade and investment.*

The evidence presented above demonstrates that GVCs are an important feature of trade, investment and production patterns in the world economy today, with significant impacts on economic performance. For policy makers, the question is how best to derive benefits from GVCs for the economy and society. Opening to international trade and investment is necessary but it is not sufficient to connect to global value chains and obtain benefits in terms of employment and income growth. Public and private investment to improve supply-side capabilities, and the ability to exploit new market opportunities generally, are also needed. Investment in people's education and skills is particularly important – and needs to be complemented by effective labour market policies and social safety nets to enable displaced workers to find other jobs. Moreover, increasingly, the ability to benefit from global value chains is linked to investment in knowledge-based assets such as R&D, branding, design and software that enable firms to differentiate their products and economies to strengthen their performance in global networks. This section explores the policies that can help countries benefit from GVCs.

### Integration in global value chains requires openness to international trade

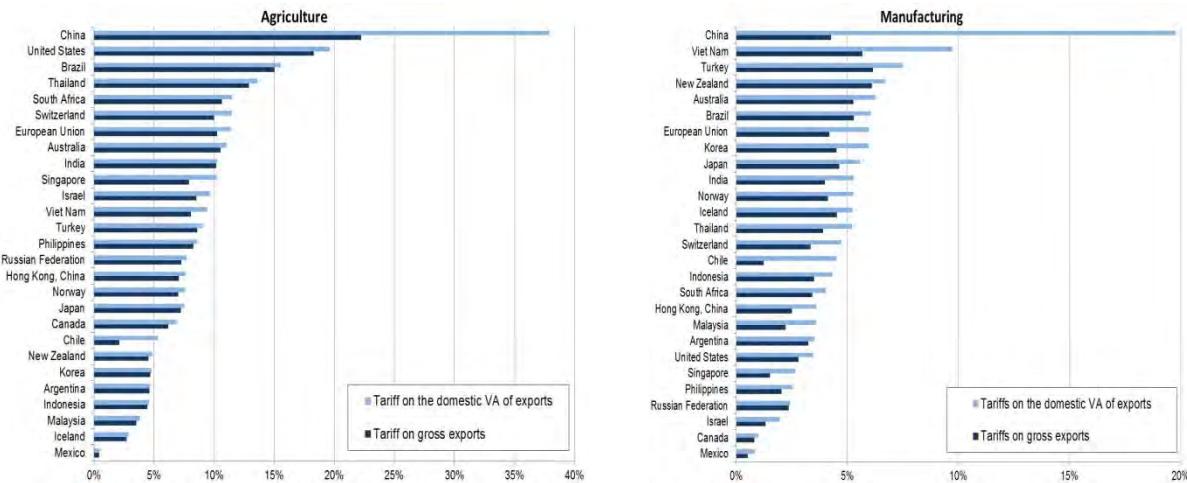
*Global value chains requires a new look at trade policy ...*

The globalisation of supply chains calls for a more coherent view of trade policy. After more than a half a century of trade liberalisation, nominal tariffs on manufactured products in developed economies are generally low, and bound in the World Trade Organization (WTO) at zero or close to zero. Although the situation is somewhat mixed for developing countries, the general trend has also been towards lower tariffs. In a world characterised by GVCs, however, things are not as clear-cut: tariffs are cumulative when intermediate inputs are traded across borders several times. Downstream firms pay tariffs on their imported inputs, and then face tariffs again on the full value of their exports, which include those same imported inputs. Tariffs can still reach quite a high level by the time the finished good reaches customers, dampening demand and affecting production and investment at all stages of the value chain.

*...as the costs of protection can be significantly higher in a GVC.*

As shown in Figure 7, nominal duties on gross exports are the conventional, but incomplete, measures of tariff barriers. Exported products are not made solely with local inputs, yet tariffs are levied on the gross value every time they cross a border rather than on the value added by the last country. Therefore, the larger the share of foreign inputs in production, as in China, the Netherlands or Vietnam for manufactured goods, the higher the costs imposed on exporters by tariffs in their target markets. In agriculture, the share of domestic content is often larger, but effective tariffs may also be high because the pace of nominal tariff liberalisation in this sector has been slower. Thus, in a world dominated by GVCs, the cost of protection can be higher than generally presumed; this is particularly the case in economies with a larger share of intermediate imports in their exports and higher tariffs.

**Figure 7. Tariffs on the gross and the domestic value-added of exports (2009)**



Source: OECD ICIO and UN TRAINS. Applied *ad valorem* equivalent tariffs, weighted by the share of each sector and destination market in the country's agricultural or manufacturing exports.

*In GVCs, success in international markets depends as much on the capacity to import inputs efficiently as on the capacity to export.*

Protective measures against imports of intermediate products increase the costs of production and reduce a country's ability to compete in export markets: tariffs and other barriers to imports are effectively a tax on exports. Therefore, policies that restrict access to foreign intermediate goods and services also have a detrimental impact on a country's position in the regional or global supply chain. In developing economies where export capacity often hinges on foreign investment, even small tariff costs may discourage firms (foreign or domestic) from investing, or from maintaining investment, in the country – and may lead them to take production facilities, jobs and technology somewhere else. Export restrictions can also affect the efficient functioning of GVCs, not only the exporters directly targeted, but also downstream sectors abroad, in particular when the country imposing the restriction accounts for a significant share of global supply of specific products. For those products, export taxes and quotas can disrupt production and raise costs throughout entire GVCs.

### **Trade facilitation: addressing border bottlenecks and avoiding unnecessary restrictions**

*Fast and efficient customs and port procedures facilitate the smooth operation of value chains.*

As goods cross borders many times in GVCs, first as inputs and then as final products, fast and efficient customs and port procedures are essential to the smooth operation of supply chains. To compete globally, firms need to hold lean inventories but be able to respond quickly to demand; they therefore suffer from unpredictable delays at the border for documentation, inspection or clearance. A country where inputs can be imported and exported quickly and reliably is therefore more attractive to foreign firms seeking to outsource production stages. The role of trade facilitation measures in fostering integration into global markets is greater when production networks are global.

*Simplifying administrative procedures can reduce trade costs by 10% in OECD countries.*

Streamlining administrative procedures at the border also helps countries reap the full benefits of GVCs. The most effective steps are simplification of procedures through single windows, pre-arrival processing and advance rulings on goods classification and applicable duties. Altogether, there is scope to reduce trade costs by about 10% in OECD countries.

*Convergence and mutual recognition of standards and certification requirements can alleviate burdens on firms.*

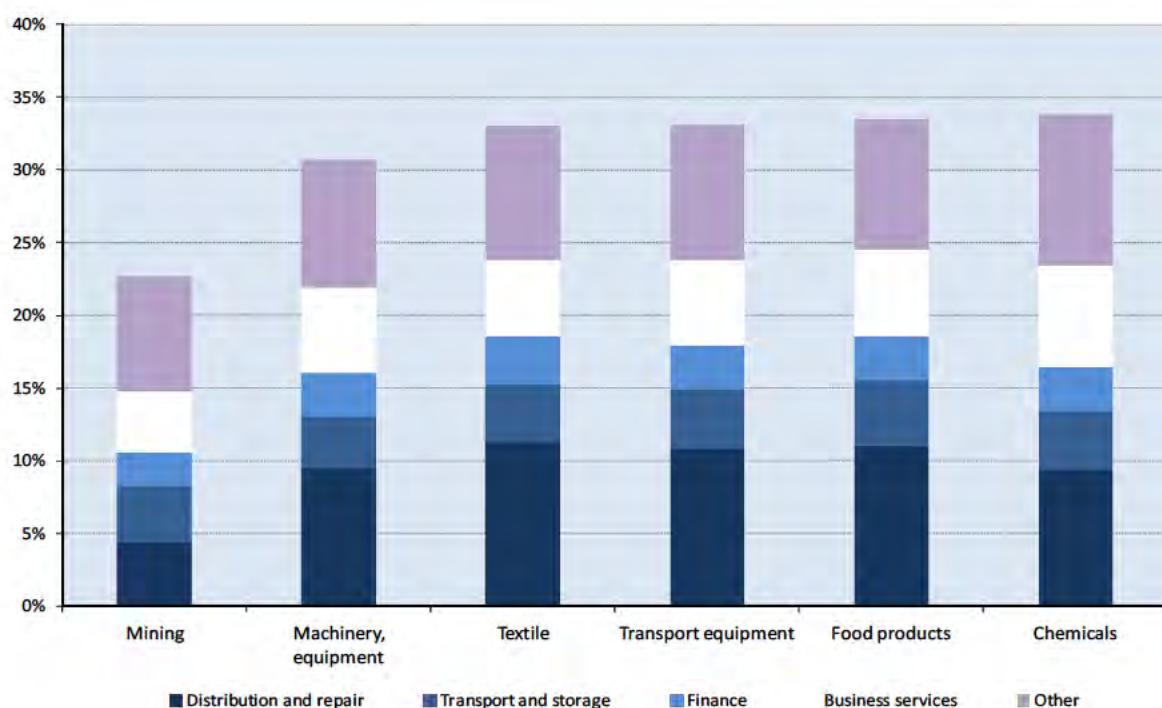
Information flows, co-ordination and traceability of products are important for GVCs and have led to a rising number of quality and safety standards. While the need to protect final consumers through appropriate quality standards should not be understated, their complexity, and above all their heterogeneity, has become one of the main barriers to participation in GVCs, particularly for SMEs. Upstream firms supplying a given component to several destinations may have to modify their production process to comply with different standards or they may incur burdensome certification procedures several times for the same product. In food value chains, process standards adapted to one country's suppliers may make it all but impossible to export to another country. The convergence of standards and certification requirements and mutual recognition agreements can go a long way towards alleviating the burden of compliance and enhancing the competitiveness of small-scale exporters.

#### ***Efficient services markets: improving competitiveness behind the border***

*Services are the key to the efficient operation of global value chains*  
...

GVCs also increase the need for the co-ordination and efficient linking of stages and countries, with services playing a particularly prominent role. They rely heavily on logistics and information and communications technologies and therefore on efficient network infrastructures and complementary services. There would be no GVCs if well-functioning transport, logistics, finance, insurance, communication and other business services did not move goods and co-ordinate production along the value chain. Moreover, knowledge-based services often help to differentiate products for specific markets and consumers, adding value in the process.

**Figure 8. Services share of value added in world manufacturing exports, 2009**



Note: \*The share of distribution does not include distribution services for final goods.

Source: OECD-WTO TiVA Database, April 2013.

*... and play a far more important role in trade than gross trade statistics indicate.*

*They in fact generate much of the value added in manufacturing.*

The OECD-WTO estimates of trade in value-added terms confirm that services play a far more significant role than suggested by gross trade statistics. Figure 8 shows that the value created by services as intermediate inputs represents over 30% of the total value added in manufactured goods. In the countries covered by the OECD TiVA Database, directly and indirectly embodied services account for over a third of value added in chemicals, motor vehicles, textiles and food products.

Distribution and transport services contribute the most value as they provide the necessary links in supply chains. Financial and business services improve the efficiency of goods production and allow GVCs to work. Improvements in the performance of the services sector, including through liberalisation of services trade, would allow for more efficient, higher-quality and higher-value services, thereby enhancing the competitiveness of manufacturing firms and facilitating their participation in global production networks.

### **How can trade policies help firms enter GVCs and grow?**

*Trade and investment rules need to recognise that products are now from "everywhere" ...*

As global value chains change the patterns and structure of international trade, reaping the full benefits will require adjustments that go beyond trade policy to include policies aimed at promoting competitiveness, efficiency, attractiveness to investment as well as development and sustainability. Multilateral and

*... and that firms benefit from access to imports as well as from export opportunities.*

*The growing interaction among economies in GVCs strengthens the case for multilateral trade negotiations ...*

*... as is well illustrated by the 1997 Information Technology Agreement.*

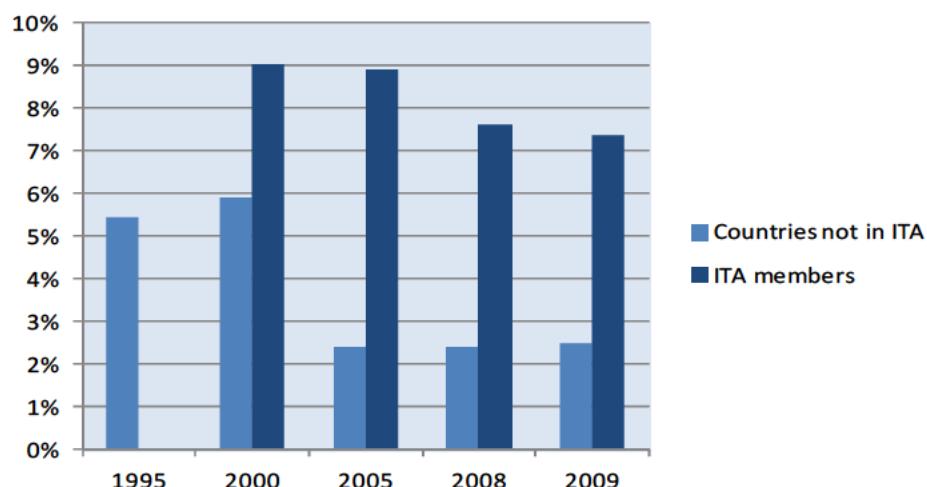
regional trade and investment rules and disciplines will also need to reflect the fact that goods and services are now often from “everywhere”, rather than, as they are generally considered today, from “somewhere”.

GVCs have clearly made counterproductive a mercantilist approach that views exports as good and imports as bad and considers market access a concession to be granted only in exchange for access to the partner’s market. In GVCs domestic firms can of course benefit from export opportunities, but they also depend on reliable access to imports of world-class goods and services to improve their productivity and competitiveness. Policy responses to this new reality can be unilateral and unilateral liberalisation has in fact occurred in recent years.

The gains from reform are multiplied when more countries participate and markets are opened multilaterally. GVCs strengthen the economic case for advancing negotiations at the multilateral level, as barriers between third countries upstream or downstream matter as much as barriers in direct trade partners and are best addressed together. A good illustration is the very successful 1997 Information Technology Agreement (ITA), which covered as many products and as many countries involved in the information technology (IT) value chain as possible. The ITA also shows the benefits of applying the most favoured nation principle in multilateral agreements and thus eliminating the “red tape” related to rules of origin and their potential distorting impact on trade.

The ITA removed tariffs on key technology and telecommunications products for 75 countries and 97% of trade in IT products. ITA members are definitely more involved in GVCs in the sector than non-signatories (Figure 9). Before the agreement, the average participation rate for all countries was about 5%. The first members of the ITA had a higher participation rate in 2000 (above 8%) and, despite a slight decrease as new members join, the participation rate of members remains much higher than for non-members.

**Figure 9. ITA membership and participation in IT GVCs (participation index in % of gross exports)**



Source: OECD (2012)

*Regional trade agreements have a role to play but should be consistent with production networks.*

Sound economics is one thing; political feasibility is another. While multilateral agreements are widely accepted as the best way to co-ordinate in an ever more interdependent world, most liberalisation over the past two decades has taken place unilaterally or at the regional level. To promote the expansion of GVCs and complement unilateral reforms, regional trade agreements (RTAs) can deepen co-operation among countries in areas such as the convergence of standards or the recognition of qualifications. However, RTAs are more effective when their membership is consistent with regional production networks and when they avoid the pitfalls of distorting firms' choices and losing the connection with the rest of the value chain. More GVC-friendly rules of origin can increase their impact on firms' productivity. In the longer term, consolidating existing RTAs in multilateral agreements would help turn the "spaghetti bowl" of preferential agreements into clearer and more efficient trading rules and disciplines for all actors in GVCs.

### ***Building on policy complementarities***

*The nature of GVCs requires a comprehensive approach to trade liberalisation.*

Trade agreements have the largest impact if they cover as many dimensions of GVCs as possible. While abolishing tariffs is a starting point for offering companies new trade opportunities, the value chain also requires efficient services and the possibility to move people, capital and technology across borders. Trade policy should address obstacles at all points of the value chain, but remain neutral with respect to firms' strategies for accessing foreign inputs and markets, i.e. it should not favour one mode of access over others. A more comprehensive approach would clearly amplify the impact of trade liberalisation on investment, growth and job creation.

### **Open, transparent and predictable investment policies facilitate integration**

*Investment restrictions will impede the development of GVCs.*

Given the important role MNEs play in creating GVCs, lowering investment barriers is among the most efficient ways for a country to become more deeply integrated in GVCs. By the same token, by inhibiting the creation or the efficient functioning of GVCs, impediments to cross-border investment can have negative welfare impacts beyond the home and host country. The current international investment regime built on thousands of bilateral and regional investment agreements does not adequately reflect this. Further attempts towards multilateral co-operation and co-ordination such as the OECD Policy Framework for Investment and the OECD Codes of Liberalisation are needed to maintain the open and predictable international investment climate that has supported international investment in GVCs. In support of such co-operation, better frameworks for measuring investment are needed.

*Investment promotion policies need to take into account the reality of GVCs.*

Specific measures to promote and facilitate investments can be successful if they take place within the context of, and not substitute for, broader policies for improving the investment environment. Policy tools such as the Policy Framework for Investment have been designed around the whole-of-government approaches needed to establish an environment conducive to receiving international investments linked to GVCs. Investment promotion policies will have to take into account the new reality of GVCs: attracting foreign investors is now often focused on specific activities like distribution, production, R&D and headquarters, rather than whole industries. However, just

*There is a danger that governments may engage in incentive policies to attract valuable parts of a value chain...*

*... in particular in the current context of weak growth...*

*The growing control of MNEs, including state-owned enterprises, over certain upstream activities has raised concerns.*

as trade is about exports *and* imports, so is international investment about inward *and* outward investment. For many firms, investment abroad, including the establishment of affiliates, is critical to ensuring the survival of the remaining activities at home.

As governments become more aware of the role of international investment in GVCs, inward investment policies increasingly target individual production stages and tasks instead of industries. Governments may therefore be tempted to create a new generation of investment incentives aimed at specific sections of GVCs that appear to add more value. This could give rise to incentive wars for “prized” parts of certain value chains. In the absence of disciplines or international co-ordination of investment incentives, this could effectively transfer a share of the value created to international investors, at significant cost to taxpayers.

This is particularly a concern in the current context of weak growth, as governments are under intense pressure to assist domestic companies and to preserve jobs. As a result, they may sometimes resort to policies or practices that discriminate against foreign investors or discourage outward investment. They may also be tempted to yield to this pressure in informal and diffuse ways that are not manifested as policy changes, thereby undermining investors’ confidence that frameworks in host countries are predictable and transparent. Strengthening multilateral co-operation and avoiding such policies can help ensure that the multilateral investment system continues to strengthen GVCs and support future growth.

Large MNEs, including in some cases state-owned enterprises (SOEs), are prominent players in many GVCs. As a greater share of international investment comes to be controlled by SOEs, these firms will become more prevalent in GVCs. From 1995 to 2007, the average contribution of SOEs to total international mergers and acquisitions (IM&A) was only 3%. Between 2008 and 2012, SOEs contributed over 10% of the total, with a peak of 21% in 2009 (Figure 10). Concerns have been expressed over the effects of this investment on competition and markets, and, within GVCs, how SOE concentration in upstream markets might eventually have implications further downstream.

**Figure 10. International mergers and acquisitions by state-owned enterprises, world, 1995-2012**



Source: OECD.

*GVCs can support the spread of responsible business conduct.*

GVCs are, increasingly, more than just a more efficient way of producing goods and services. They are also an international channel for ideas. These ideas can take the form of new knowledge and innovations, as embodied in intermediate goods and services and production methods. They can also convey social expectations of responsible business conduct. Governments are recognising this and are seeking to leverage this dimension of GVCs, which is increasingly aligned with firms' interest in reputation and branding as a way of ensuring their future in global value chains. The OECD Guidelines for Multinational Enterprises and implementation tools such as the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas are policy instruments for promoting responsible business in GVCs.

### Participation in value chains requires a conducive business environment

*To benefit from value chains requires high-quality infrastructure, ...*

Participating in a global value chain is not just about openness to trade and investment. National policies also need to facilitate firms' participation in international production networks. For example, a high-quality infrastructure – airports, harbours, railways and highways – enables the efficient international transfer of goods, services and people and enables just-in-time production. Air transport is particularly important for the transport of high-value and time-sensitive goods.

*... adherence to international standards, well-developed ICT networks, ...*

Speed and flexibility are crucial not only for the exchange of physical goods and services but also for information flows within GVCs. Adherence to international standards enables the production of modular physical goods and the exchange of information across borders. GVCs depend on seamless and uninterrupted information flows across companies and countries; a well-developed ICT infrastructure (increasingly involving broadband networks) is therefore necessary to connect firms and countries to value chains.

*... as well as "soft" infrastructure, such as sound legal systems and good governance.*

In addition to “hard” transport and communication infrastructures, “soft” infrastructure – facilitating policies, procedures and institutions – also matters. For example, since GVCs involve activities contracted between MNEs and independent suppliers, the ability to enforce contracts is crucial. In fact, countries with sound legal systems tend to export more in more complex industries. Tasks that require more complex contracts (e.g. R&D, design, branding, etc.) are also more easily carried out in countries with well-functioning contractual institutions. Countries characterised by poor governance and political instability, instead, have often failed to attract foreign investors to export processing zones, even though these zones are meant to shelter investors from local rules.

*Efficient services also help connect economies to global networks.*

Competitiveness in GVCs is also critically dependent on efficient services inputs. Investment in logistics services – the organisation and management of international shipment operations and the tracking and tracing of transport flows – helps enhance trade flows. High-quality logistics affect trade more than distance or transport costs; recent OECD results indicate that every extra day needed to ready goods for export and import reduces trade flows by around 4%. Likewise, the development of communication and information services as “enablers” leverages countries’ integration in GVCs. These services may even help transform emerging and developing economies into centres of offshore services, as is the case for India and Mauritius.

*A strong supply capacity in domestic firms is a pre-condition for global engagement*  
...

*...and requires efforts to strengthen business linkages and the capabilities of SMEs.*

Finally, the supply capacity of domestic firms (often SMEs) plays a role in participation in GVCs. Companies searching for independent suppliers in foreign markets are attracted to “thick” markets: if the market is large and has many suppliers, firms will have a greater chance to find the right match and if a supplier fails to deliver, alternatives will be available.

For these reasons, some countries have sought to increase opportunities to link local firms and international partners through provision of information and building awareness, training facilities and courses, capacity-building programmes, upgrading activities, etc. Many governments are also taking action to help SMEs benefit from value chains, for example by promoting their capacity to innovate, raising awareness of the opportunities associated with value chains, or facilitating the adoption of product standards.

### **Engagement in global value chains can support economic development**

*Industrial development strategies tended to focus on import substitution, ...*

Until the 1980s, industrial development policies in many emerging and developing countries were focused on import substitution, i.e. replacing foreign imports with domestic production in order to reduce foreign dependency. Government interventions aimed at creating an internal market and developing manufacturing capabilities, often through “protectionist” policies such as tariff barriers, support for key industries, nationalisation, etc. As they frequently failed to succeed, such policies were gradually abandoned in the 1980s and 1990s and development strategies increasingly became export-led.

*...but became more export-led over time, with a focus on building*

The difficulty with these strategies was that they often aimed to develop a broad industrial base and build complete, vertically integrated, domestic value chains. FDI was promoted to the extent that MNEs brought external knowledge; local

*up entire value chains.*

content requirements were meant to ensure that domestic companies learned from foreign expertise. This was relatively straightforward for light manufactures such as textiles, but more difficult for capital- and knowledge-intensive industries, where economies of scale and lack of knowledge transfer were important constraints.

*Integrating a GVC can be a quicker and easier track to development ...*

In a world of GVCs, however, building a complete value chain is often neither optimal nor even possible. Instead, governments can encourage firms to join existing global value chains, a quicker and less costly road to exports. Instead of fostering industrialisation through the development of vertically integrated industries (and producing both intermediates and final products), countries can now become export-competitive by specialising in specific activities and tasks. For example, China has specialised in the assembly of final products in the electronics industry and has become the largest exporter of ICT products; other countries have specialised in the assembly of intermediates (e.g. sub-systems for motor vehicles in Mexico), the production of parts and components, or ICT services (India).

*... and has been facilitated by the reduction in trade barriers and a range of regional trade agreements ...*

Reductions in trade barriers (including the development of export processing zones) have favoured the shift from import substitution to export promotion policies and the integration in GVCs, in particular in East Asia. In recent years, a growing number of RTAs also appear to have promoted countries' integration in GVCs in Southeast Asia. Also, the 11 trade agreements that Costa Rica has negotiated with 42 countries have enabled it to participate in GVCs in electronics, medical devices, automotive and aeronautics.

*...that have enabled several emerging countries to participate in and benefit from GVCs.*

The experience of China, Costa Rica, the Czech Republic, Mexico and Thailand demonstrates that participation in GVCs can offer a fast track to development and industrialisation. Indeed, the value added that some emerging economies have created in manufacturing GVCs has increased steadily over time (Figure 11). Motivated by these successes, other developing and emerging economies are seeking to become more integrated in international production networks. In countries as different as Samoa and Cambodia, specialisation in specific tasks has allowed participation in value chains in ways that would have been impossible just a decade ago. A first step for developing economies is therefore to consider how they can enter existing GVCs. Opening their economies to foreign trade and investment, strengthening trade-facilitating measures and reforming the business environment are among the key actions required.

*Export processing zones can help attract foreign direct investment ...*

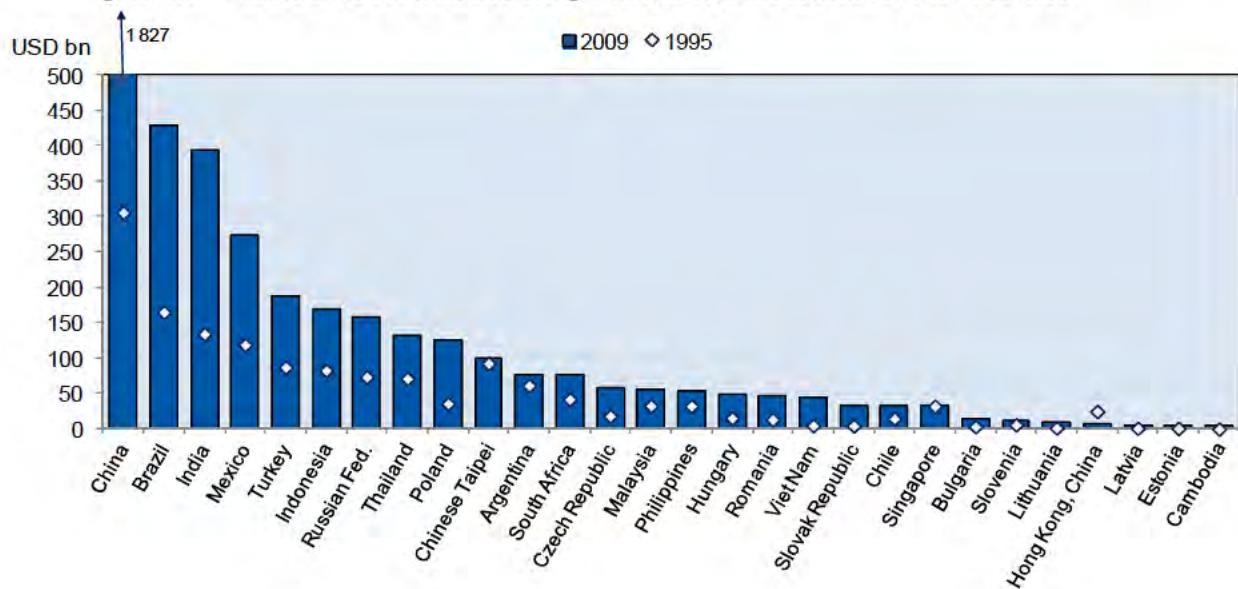
Many emerging economies have successfully used export processing zones to become involved in GVCs. Such zones can provide the appropriate conditions for foreign investors at a small scale, which is often easier for governments to implement. Estimates suggest that 3 500 such zones were in operation in 2007 across 130 countries, providing jobs for 68 million people. Foreign investors are attracted to export processing zones because of low costs and ease of importing and exporting; low or zero tariff barriers and minimum administrative requirements allow companies to source intermediates efficiently from abroad. Much of the success of these zones depends on the quality of infrastructure and logistics, however, rather than on low labour costs. Export processing zones are estimated to account for almost half of China's exports and 40% of Mexico's.

*...although the footloose nature of MNE investments is a potential risk.*

However, as these zones tend to rely heavily on imported intermediates, they do not necessarily create much value added for the host country. Moreover, they have mainly been successful in assembly and low-cost manufacturing.

While integration in GVCs has provided emerging economies with access to investment, knowledge and technology, it often takes place through affiliates of foreign MNEs in export processing zones. This may entail risks for host economies, given the increasingly footloose character of MNE activities. Once wages and costs in the host country increase above a certain threshold, these activities may move to an economy that offers lower costs. The risk is particularly acute for small emerging and developing 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 and diversifying the country's participation in GVCs.

**Figure 11. Value added in manufacturing GVCs, selected economies, 1995 and 2009**



Source: OECD-WTO TiVA Database, April 2013.

*Moreover, MNEs may capture most of the value...*

When countries participate in global value chains mainly through affiliates of foreign MNEs, these firms continue to capture much of the value. They often own and control the knowledge-based assets that create value in the GVC: brands, designs and patents, but also organisational and distribution networks. Some emerging economies are therefore seeking to strengthen their investment in such assets so as to increase the value created in GVCs and eventually develop their own value chains.

*...and limited spillovers to the domestic economy may result in isolated pockets of production ...*

There is also a risk that specialisation in specific production stages and the accumulation of firm-specific rather than industry-specific or broadly applicable knowledge may lead to isolated pockets of production with limited impact on the rest of the economy. Governments can take steps to encourage the development of spillovers from GVCs through policies to encourage co-operation and strengthen linkages with foreign firms.

*...and necessitate a range of complementary policies.*

Integration in global value chains is therefore not a silver bullet for economic development. Rather, it can provide a stepping stone to development if it is combined with capability-enhancing policies at the national level, including policies to strengthen the domestic business sector. Over time, this may lead to the development of new value chains. For example, in recent years, two Chinese firms, Lenovo and Huawei, have introduced global brands and expanded their operations abroad, as has the Indian firm Tata and the Brazilian firm Embraer. However, while electronic firms from Chinese Taipei have upgraded from being key suppliers to being original equipment manufacturers, most have not (yet) succeeded in becoming original brand manufacturers, as this would make them direct competitors to their customers (i.e. lead firms in the computer GVC such as Dell or Hewlett Packard).

*Some low-income economies remain excluded from GVCs ...*

While some emerging and developing economies now participate in GVCs, many low-income countries remain excluded for various reasons. These include a geographical location distant from existing trade networks, lack of natural resources to facilitate insertion in GVCs, lack of the necessary infrastructure or skills, or a business environment that does not provide some of the necessary preconditions for investment.

*...and may require donor support through aid-for-trade policies.*

In some cases, these constraints can be overcome through capacity building, through policies to help improve the business environment, develop infrastructure or strengthen skills. This may be difficult for the poorest developing economies, which would benefit from donor support through “aid for trade” initiatives. Many projects supported by donors aim to upgrade quality or to reduce trade costs that hinder connection to value chains. Examples include projects in Cameroon to improve bananas, in Rwanda to improve the quality of tea, in Bangladesh to upgrade the quality in the readymade garment sector, in Guatemala to improve organic crops, in Peru to improve milk quality, in Mozambique to revive processed cashew exports, or in Indonesia to improve dairy livestock. A recent OECD-WTO questionnaire to donors suggests that such programmes are of increasing importance in their portfolios.

*Strengthening capabilities requires a broad strategy.*

The challenge for developing economies is to engage in a broad strategy to tackle the main barriers to integration and upgrading that will differ from country to country. For example, better infrastructure and modern ports will not achieve their potential without efficient customs officials; investments in advanced training and skills cannot pay dividends without access to technology and other world-class inputs; and an open foreign investment regime will not attract private capital without reliable public institutions, sound legal frameworks and well-defined property rights.

### **Upgrading in GVCs requires supportive policies**

*Upgrading in GVCs is a policy priority in many economies ...*

Once countries are integrated in GVCs, the question of upgrading arises. As productivity and wages go up and their original position is eroded by international competition, firms may be forced to move to other segments of the value chain or upgrade their existing position. For many countries, upgrading their position in value chains and enhancing the benefits from globalisation are currently policy priorities. A position in higher-value-added activities and market segments is typically expected to generate larger economic benefits,

including high-wage employment and higher incomes. Advanced economies typically seek to retain their edge in such activities, whereas emerging economies want to upgrade their position to gain greater benefits from their participation in GVCs (Box 2).

*...and requires specialisation and improvements in productivity and quality.*

The optimal position in the value chain is an issue of interest to many policy makers. High-income economies may prefer industries and activities that create higher value added. More value tends to be added in upstream activities of GVCs, such as product design, R&D or the production of advanced parts and components, or in downstream activities, such as marketing or branding. In practice, however, advanced economies still compete in many parts of the value chain, depending on their specific comparative advantage, including in resource-intensive sectors, such as agriculture, mining and food processing, and in segments of low-technology industries, including textiles. Italy, for example, continues to have a strong revealed comparative advantage in textiles and clothing. Typically, this is due to specialisation in niche activities, high productivity and high quality, which enables firms in advanced economies to compete with firms in emerging and developing countries with much lower costs. Today, “what you do” (the activities you are involved in and the value that you create) often matters more than “what you sell” (the products that make up final exports). Where the value is being created will differ across industries and value chains, suggesting there is no one-size-fits-all approach to upgrading.

#### **Box 2. Upgrading in a global value chain**

There are several approaches to upgrading in a value chain:

- *Process upgrading* occurs when firms can process tasks with greater efficiency and lower defect rates than their rivals or process more complex orders. An example is Hon Hai precision (or Foxconn), the world's largest original equipment manufacturer (OEM), renowned for its ability to carry out large-scale production with short deadlines and highly specific requirements from major electronics brands such as Apple, Dell, Samsung and Sony.
- *Product upgrading* occurs when firms can supply higher value-added products than their rivals through superior technological sophistication and quality. It also involves the capability to introduce novel products faster than rivals. Examples include the so-called “hidden champions”, i.e. firms with high world market shares in very specific products, but also ASUSTek, an inventor of netbooks that captured the demand for low-cost, easy-to-use portable PCs, or Toyota which introduced the first mass-produced hybrid vehicle, the Prius.
- *Functional upgrading* occurs when firms can provide competitive products associated with higher value-added in new segments of a GVC. For firms specialised in production, this means moving into upstream and downstream activities such as design or marketing. For example, Lenovo developed more sophisticated R&D capabilities, including the ThinkPad brand, through its acquisition of IBM's PC branch. IBM, instead, upgraded from a PC manufacturer to a provider of technology and consultation services. Li and Fung, a Hong Kong-based intermediary for consumer goods, upgraded from a supply chain management firm by acquiring product development, marketing and branding functions.
- *Chain upgrading* occurs when firms are able to participate in or switch the locus of their activities to new GVCs producing higher value-added products/services. These capabilities include managerial talent, which helps identify potential opportunities and threats and enables firms to reconfigure their resources and organisational structures in a timely manner. Recent examples include Samsung, the world's largest semiconductor producer, which decided to invest USD 20 billion over ten years in new industries such as solar panels, light-emitting diodes (LEDs) and electric-car batteries, and Nestlé, the food industry giant, which has invested heavily in health-oriented processed foods associated with higher profit margins and more room for disruptive innovation than conventional food products.

*A wide range of productivity-enhancing policies will be required.*

Governments can support the process of GVC upgrading in various ways. Policies to support the upgrading process are generally not fundamentally different from policies to enhance productivity. Consequently, governments should strengthen product market competition to encourage firms to improve productivity; foster a dynamic business sector that allows new, innovative firms to emerge, experiment and grow; invest in productivity-enhancing public goods such as education, research and infrastructure; and provide the framework conditions to support business investments in such areas.

### **Investment in knowledge-based capital can support the upgrading process**

*Investment in knowledge-based capital is an important determinant of value creation in a GVC ...*

*... as it enables product diversification and thus enables firms to compete.*

*Different forms of KBC support the upgrading process.*

*Economic competencies such as skills, management and organisational factors are particularly hard to replicate ...*

*...and can provide a sustained source of comparative advantage.*

A particularly important driver for upgrading in GVCs is investment in knowledge-based capital (KBC). The highest level 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.

Investments in KBC not only drive productivity growth, they also determine the extent to which the final product of a value chain can be differentiated in consumer markets, which in turn determines the total value the GVC can create. 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.

Different types of knowledge-based capital (KBC) play a role in GVCs and there are three main categories: computerised information (software and databases); innovative property (R&D and non-R&D innovative expenditures including copyrights, designs and trademarks); and economic competencies (brand equity, firm-specific technological and managerial skills, networks, and organisational structures).

Economic competencies, which include firm-specific skills such as superior management, brand equity and organisational structure, are, in general, more tacit forms of knowledge and may therefore be more difficult to replicate than innovative property or computerised information. In practice, it is often a complex combination of several forms of KBC that is the source of firms' competitive advantage. For example, some firms rely on simulations of product design and workplace organisation based on large computerised data sets – often referred as “big data” – to achieve faster product introduction and greater efficiency. Nevertheless, even a cutting-edge technology may not be a sustainable source of value in a GVC if it can easily be replicated by rivals.

The OECD's analysis shows that investment in KBC is an important source of competitiveness and plays a major role in supporting upgrading in global value chains. A recent survey of Japanese firms, for example, emphasises the

*Supporting investment  
in knowledge requires  
new policy thinking, ...*

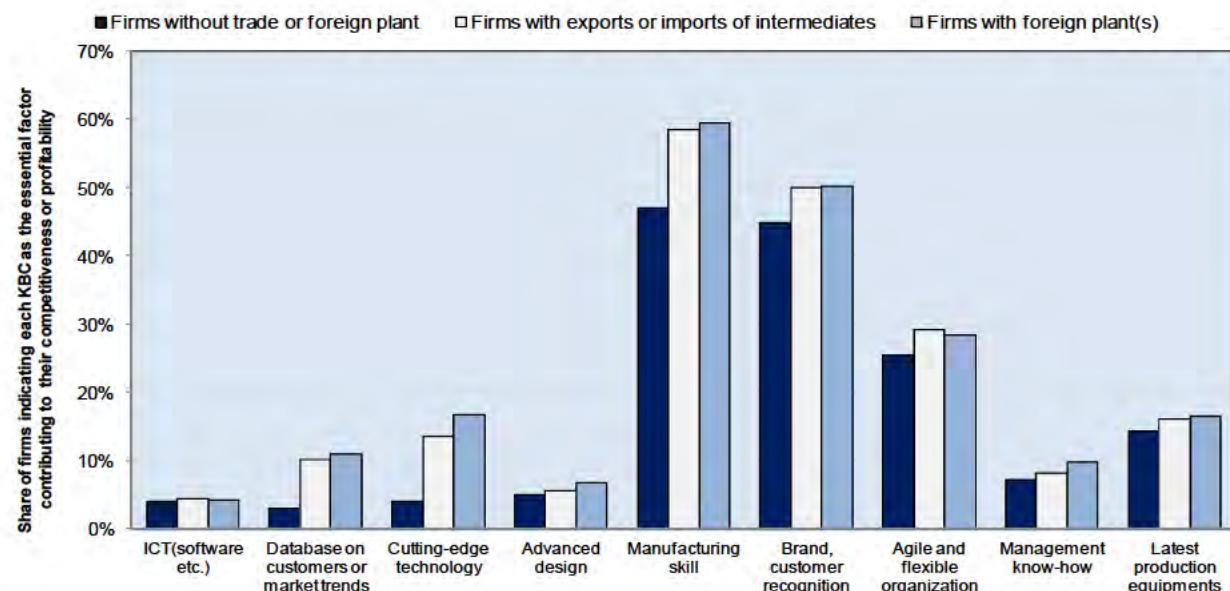
*... including a much  
broader notion of  
innovation, ...*

importance of economic competencies for competitiveness, notably "manufacturing skills", "brand and customer recognition" and "agile and flexible organisation" (Figure 12). The Japanese firms that are the most engaged in GVCs, i.e. those with exports or imports of intermediate goods and those that own offshore plants, consider such competencies more important than firms without trade or foreign plants. These firms also put greater emphasis on cutting-edge technology and "big data" as sources of competitive advantage than firms oriented towards the domestic market.

To promote long-term growth and the jobs of tomorrow in a world of GVCs, governments must ensure that policy and institutional frameworks facilitate business investment in KBC. First, policies that facilitate linkages between GVC participants and the local knowledge base – such as research and training institutions – can contribute to positive feedback loops between the accumulation of KBC and the upgrading of GVC activities. Such knowledge linkages enhance firms' learning abilities and enable them to leverage their participation in GVCs.

The broad range of KBC that drives competitiveness in GVCs also highlights the importance of a broader conception of innovation than the conventional view, which is dominated by R&D. Well-designed support measures, such as those that facilitate access to finance for small innovative firms or that support KBC investments in areas with the highest social return, along with frameworks that foster collaboration to innovate and the redesign of some long-standing innovation programmes, are all required. For instance, most OECD governments try to help businesses access research and technology-related advice and information. However, the evidence on the role of economic competencies in GVCs suggests that an exclusive focus in such schemes on science, technology, engineering and mathematics is too narrow. In the United Kingdom, nearly half of academics from the creative arts and media are engaged with business in some way. This reflects the changing nature of innovation and needs to be reflected in government programmes. Well-designed demand-side policies, such as innovation-oriented competitive public procurement, can also help strengthen the innovation system and ensure that innovation meets public needs. And once policy is set, continuity – keeping policy uncertainty to a minimum – is important.

**Figure 12. The relevance of various forms of KBC to the competitiveness of Japanese manufacturing firms**



Note: The shares do not add up to 100% because firms are allowed to select multiple forms of KBC that they consider essential. The figure shows the share of firms that indicate the form of KBC concerned to be essential to competitiveness.

Source: Ministry of Economy, Trade and Industry, Japan, "The Survey on Global Value Chain", November 2012.

*... a stronger emphasis on new business models and organisational forms ...*

The use of KBC in the upgrading of value chains will also require experimentation by firms of all sizes with new business models and organisational forms. Policy should 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.

*...and new approaches to the financing of entrepreneurial firms.*

Financing is also a key area because it supports innovation and diversification. In traditional debt markets, tangibles (assets such as equipment and structures) have well-defined market prices and readily serve as collateral. The increasing importance of KBC underscores the need for market-enhancing policy instruments to address shortfalls of early-stage risk capital that affect young KBC-intensive firms and the need for better ways for firms to communicate the value of KBC in their business models. The OECD finds that countries that invest more in KBC are also the countries that reallocate resources to innovative firms more effectively. As a share of GDP, the United States and Sweden invest about twice as much in KBC as Italy and Spain, and patenting firms in the United States and Sweden attract four times as much capital as similar firms in Italy and Spain. These differences are even larger for young firms that are more likely to experiment with radical innovations.

*Intellectual property rights help protect the critical knowledge assets that enable firms to compete ...*

*...and policies need to ensure that intellectual property rights continue to support innovation and growth.*

*Governments can also support knowledge investment in specific areas, such as data, ...*

*...design, ...*

*...and R&D.*

In the highly interconnected, knowledge-driven economy of GVCs, high-quality intellectual property rights are an increasingly important framework condition. These help protect the critical KBC that enables firms to create value and compete in global markets and help to avoid easy replication by rivals of new design and technologies. Patents, for example, can increase incentives for investment in knowledge, promote knowledge diffusion, provide a market-based mechanism for the direct transfer of ideas, and give important signals to external investors about firms' KBC. A sound and high-quality IPR regime, combined with good enforcement, is therefore important.

However, there are concerns that certain features of IPR regimes may be hindering innovation and competition and have not kept pace with technological change. In a world increasingly based on knowledge assets, IPR regimes must be coupled with pro-competition policies and efficient judicial systems to help erode the rents arising from monopoly protection. Moreover, steps should be taken to address the perceived erosion of patent quality, i.e. the question of the accuracy of patent claims and whether patents correspond to genuinely novel innovations. OECD data suggest that patent quality across the OECD area has in fact eroded steadily over the last decade. There is also a need for greater mutual recognition and compatibility across IPR systems internationally, for instance to permit cross-border copyright licensing.

Governments will also need to foster investment in knowledge in certain areas. For example, creating economic value from large data sets is at the leading edge of business innovation, and companies that base key decisions on data analytics are outperforming other firms. While there is no clearly optimal policy in this fast-evolving field, it is evident that to unlock major economic benefits all OECD governments must do more to implement coherent policies in the fields of privacy protection, open data access, ICT infrastructure and ICT-related skills.

Design also creates value in GVCs. In the United Kingdom in 2004, around half of the exports of winners of the Queen's award for exports were attributed to investments in design. While design is important for upgrading in GVCs, it has received relatively little attention in policy and in the area of IPR. Countries differ significantly in terms of design rights and often have multiple systems in operation. Little is known about the best approach in this area.

Finally, investment in R&D remains a key driver of long-term innovation and it is here that the spillover effects of investment are likely to be high. Governments will need to invest in basic and long-term R&D, which is not being undertaken by the business sector, but which continues to provide the foundation for long-term innovation. Most of the key inventions underlying the Internet, it should be recalled, arose from government-funded research.

## **GVCs affect policies to enhance competitiveness**

*The spread of GVCs challenges some existing thinking on competitiveness ...*

GVCs also challenge the prevailing policy thinking about competitiveness. Exports today increasingly rely on technology, labour and capital embodied in intermediate goods imported from other countries. The drivers of competitiveness therefore increasingly include factors that are outside the scope of national policies. This limits the direct influence of policy on growth and job creation within national borders.

*... as firms are increasingly global and policies are mostly national.*

*Attracting and retaining economic activities therefore requires long-term strategic thinking...*

*...and may enable the development of spillover effects.*

*The loss of manufacturing jobs has led to a call for "industrial" policies in some countries ...*

*...but this often ignores the functioning of GVCs ....*

*...and the new division of labour that has emerged.*

There is also a growing tension in competitiveness policies between the global character of individual firm strategies that include international activities in GVCs and government policies that target local jobs and value added. In an era when some MNEs' operations are larger than some national economies, the contribution of domestically owned firms to the national economy is no longer easy to pinpoint. Likewise, the returns to investments by domestic firms in the national economy – and the support that governments provide to that investment – may partly “leak” to other countries through linkages to GVCs. This leakage may be compounded by the tax planning strategies of multinational firms.

It is against this background that governments are looking for new ways to position economic activities in these global networks of production and innovation with a view to safeguarding growth and employment at home. The focus in such policies is on strengthening production factors that are “sticky” and less likely to cross borders. They include investment in people and skills and high-quality infrastructure and encouraging strong industry-university linkages and forms of tacit knowledge. The quality of institutions and government also plays a role and can be a major factor in the decision of firms to invest and engage in economic activities in a country.

Moreover, as economic activities become more mobile, co-location effects can be expected to become more important for competitiveness. Firms may wish to locate in a country to engage with other actors and benefit from their proximity. The interaction of different activities in a value chain is often important in this respect. For example, concerns are expressed in many OECD countries that the loss of certain manufacturing activities could result in a loss of R&D and design capabilities.

One response to the loss of manufacturing and the growing fragmentation of production has been a call for industrial policies, often with a strong focus on manufacturing. Such policies capture a range of initiatives. In some cases, they discourage (manufacturing) companies from relocating activities abroad. In others, they give implicit support to the manufacturing sector. Clearly, manufacturing continues to matter in a world of GVCs. Tangible goods continue to dominate global trade, even if much of the value embodied in goods now derives from services inputs.

However, many of the defensive policies aimed at supporting manufacturing ignore the realities of today's global economy. Relocating some activities abroad leads to important productivity increases at home that enhance competitiveness and support job creation throughout the economy. In a world of global value chains, firms require imports from abroad and will need to offshore some of their activities in order to remain competitive at home. New OECD work shows that outsourcing and offshoring enhance the export competitiveness of countries in GVCs, by providing access to cheaper, more differentiated, and better quality inputs.

GVCs are also at the heart of the discussion on “making things instead of making ideas”, which relates to the debate on the future of manufacturing in developed economies. The fragmentation of production has so far led to a division of labour in which OECD countries have specialised in upstream

*The new competitiveness landscape also includes a greater appreciation for the contribution of services.*

*Governments can play a supportive role in ensuring the future of manufacturing ...*

*... by enhancing their focus on activities and tasks ...*

*... and avoiding beggar-thy-neighbour support policies.*

activities such as R&D, design, innovation, etc., while emerging countries have specialised more in manufacturing and assembly activities.

The result of this global restructuring process is that while OECD countries still create a large part of the value generated by GVCs, they are often no longer able to maintain large numbers of manufacturing jobs. Policies that focus exclusively on manufacturing may ignore the growing importance of services for value creation in GVCs, including for the production of manufactured goods. Manufacturing companies no longer sell only goods but instead sell bundles including design, development, marketing, warranties and after-sales care. Rolls Royce, for example, no longer focuses on selling aircraft engines and cars but on ‘solutions, outcomes or experiences’. Furthermore, turning innovation and knowledge into jobs may be more likely in services than in manufacturing; developed economies are likely to create few new employment opportunities in manufacturing. Moreover, the OECD-WTO estimates of trade in value added draw attention to the value created by services as intermediate inputs in manufactured goods. In addition, many services, notably most personal services, are still – at least for now – less susceptible to being relocated abroad.

This is not to say that governments cannot play a useful role in maintaining manufacturing capabilities. Recent technological advances, such as the emergence of 3-D printing, may enable manufacturing firms to engage in tailored production – but with the efficiencies of mass production – close to their markets. This could reduce the need for offshoring. Strategies and policies that support the building of such new capabilities, including the necessary skills, infrastructure and research, therefore provide a new way forward to ensure the future of manufacturing in advanced economies.

The emergence of GVCs also has implications for policies that can strengthen competitiveness. Existing innovation policies, for example, remain important for the creation (and capturing) of value within GVCs but may need to be re-oriented to take better account of the organisation of the global economy in terms of activities and tasks instead of industries or products. To remain competitive, developed economies will need to focus on tasks with high value added to compensate (to some extent) for their typically higher costs.

Old-style industrial policies characterised by industry-specific support policies or national champions have no role to play in a world characterised by GVCs. They distort international competition and the efficient operation of value chains and run the risk of an international subsidy war, with taxpayers as the main losers. More fundamentally, subsidies are not the way to encourage long-term investment and the building of capabilities.

### **The costs of adjustment can be mitigated by sound labour market and skills policies**

*Participation in GVCs inevitably involves the reallocation of resources and the displacement of workers ...*

Participation in GVCs plays an important role in enhancing productivity and living standards in both rich and poor countries. It can also help improve working conditions. However, the benefits of GVCs do not accrue automatically, and complementary policies are needed to achieve positive effects on growth and employment. Moreover, GVC-induced growth necessarily entails the reallocation of resources away from less productive activities to more productive ones, and this can mean that, even as average

*...which can be mitigated by sound social and labour market policies.*

*Investment in skills is crucial to enable people, firms and economies to benefit from their participation in global value chains.*

wages and employment conditions improve, some workers may experience unemployment or may see their real wages decline as they change jobs.

Facilitating this adjustment process and helping displaced workers find a new job is crucial; it requires well-designed social policies and a well-functioning labour market. Effective re-employment services can help the unemployed find new job opportunities. Training programmes and publicly subsidised work-experience programmes can help displaced workers take advantage of new job opportunities. Moreover, a broad package of labour and product market reforms is more likely to deliver larger overall gains in job creation and labour market performance than piecemeal reforms. Several countries have recently announced or implemented reforms to reduce the gap in employment protection between permanent and temporary workers. The impact of such reforms both on employment growth and on efficiency in the allocation of labour to the most productive uses could be boosted by competition-enhancing product market reforms in sectors with a strong potential for job creation, such as retail trade and professional services. A combination of labour market and structural reforms can enhance the resilience of economies to future shocks, be they linked to GVCs or an economic crisis.

Labour market and social policies are important, but cannot help address the main challenge: skills. Without sufficient investment in skills, people languish on the margins of society, technological progress and involvement in GVCs do not translate into productivity growth, and countries can no longer compete in an increasingly knowledge-based global economy. At a time when growing economic and social inequalities are a major challenge, effective skills policies must therefore be part of any response. In addition, skills can depreciate as skill requirements evolve and individuals lose skills they do not use. For skills to retain their value, they must be continuously maintained and upgraded throughout life so that people collaborate, compete and connect in ways that drive economies forward. The OECD's Skills Strategy sets out a framework for countries to take effective action in three areas: developing relevant skills; activating the supply of skills; and putting skills to effective use. An effective skills strategy is therefore crucial to participation and upgrading in GVCs and to the necessary adjustments.

### **The risks of value chains need to be managed by business and governments**

*The growth of GVCs has increased the risk of breakdowns in the system ...*

*... as became apparent after the economic shock of 2008 ...*

The increased connectivity brought about by GVCs has made economies more interdependent and increased the likelihood that a local disruption will lead to a system-wide failure. This systemic risk follows directly from the system's linkages and interdependencies, as the failure of a single entity or cluster of entities can cause a domino effect that may affect the entire system.

International trade is an important means of transmitting international shocks. GVCs involve trade in intermediates, which are exchanged several times across borders. A small drop in demand can therefore result in a much larger fall in trade, as occurred during the 2008-09 recession, when international trade fell five times more than global GDP. Much of the sharp contraction was due to demand for goods in industries characterised by global production networks, e.g. cars, electronics and other consumer and investment goods, for which

purchases can easily be postponed. Moreover, prevailing practices in value chains added to the decline in trade. When a downstream firm is confronted with a drop in demand for its final products, its first reaction is to run down inventories; the consequent slowdown in downstream activities reduces demand for inputs located upstream. In addition, the just-in-time nature of many GVCs causes a demand shock in final goods in one country to be transmitted almost instantly to suppliers of intermediates in other countries.

*...and natural disasters in 2011.*

Supply shocks due to natural disasters can also rapidly spread in GVCs, as was demonstrated in 2011 following the Tohoku earthquake and tsunami in Japan and later following flooding in Thailand. Relatively soon after the disaster in Japan, several firms reported production slowdowns in their affiliates abroad; slowdowns also occurred in industries such as automotive and electronics that relied on Japanese inputs. Honda and Nissan plants in the United Kingdom, for example, were forced to cut down production; for Toyota's Prius Hybrid, production shut down completely since Japan was the only source. European and US carmakers that sourced intermediates from suppliers in Japan were increasingly affected.

*The character of GVCs, including the spread of single-sourcing, has contributed to these breakdowns ...*

Single-sourcing seems to have been an important cause of the disruption in some GVCs in the automotive industry. Because of the increasingly complex character of GVCs, many carmakers were surprised to learn that their standard two-supplier rule for critical parts was not working further down the supply chain. Japan is a crucial global producer of high-technology parts and components; it accounts for 21% of semiconductor supply, 49% of optical components, 57% of image sensors, 40% of microcontrollers, 33% of display drivers and 60% of silicon wafers. Flooding in Thailand resulted in a similar shock to GVCs in November 2011. The flooding inundated areas accounting for 45% of the world manufacturing capacity of computer hard disk drives and resulted in global disruptions in the computer and automotive industry.

*...which can propagate quickly in the context of GVCs.*

The events in the automotive and electronics industries following the Tohoku earthquake and tsunami in Japan illustrate how supply shocks can rapidly propagate within GVCs. Because production is organised in a series of stages in different countries by specialised suppliers who ship the goods produced further down the chain, adverse shocks run very rapidly through the value chain. Because of lean inventories and just-in-time deliveries the system has little slack and the disruption of one or more critical, non-redundant elements can cause a system-wide shutdown. Eliminating stocks and reserves in such a system typically increases efficiency when the system works smoothly, but spreads problems when they arise.

*At the same time, GVCs have shown some resilience to shocks.*

At the same time, GVCs have shown a certain degree of resilience to shocks. During the financial/economic crisis, breakdowns in GVCs were limited as adjustments took place along the intensive margin, with firms reducing trade volumes, rather than along the extensive margin, with parts of the supply chain breaking down. When several GVCs actually broke down in the wake of the 2011 earthquake and tsunami in Japan, companies were generally able to shift to other suppliers after some time, albeit at higher cost.

*Surveys of executives point to an increase in the size and frequency of shocks.*

Surveys of company executives find that the size and frequency of supply chain shocks have increased over time and are expected to continue to do so. However, executives consider their companies' ability to mitigate – and control – supply chain risk to be quite limited (Figure 13). Manufacturing and sourcing strategies increasingly deal with greater complexity in terms of technological requirements (e.g. the growing number of intermediate inputs) and customer requirements (e.g. different varieties of one specific product). But as value chains become more complex and extensive, this creates additional layers of risk, which are not always visible and thus difficult to control. Moreover, management does not always have a clear view, on a day-to-day basis, of how their value chains are structured. The small margin of error that firms typically build into value chains to reduce costs further increases risk. Just-in-time models, lean supply structures and the absence of redundancy in the system mean that a breakdown in one part of the chain may quickly have detrimental effects elsewhere.

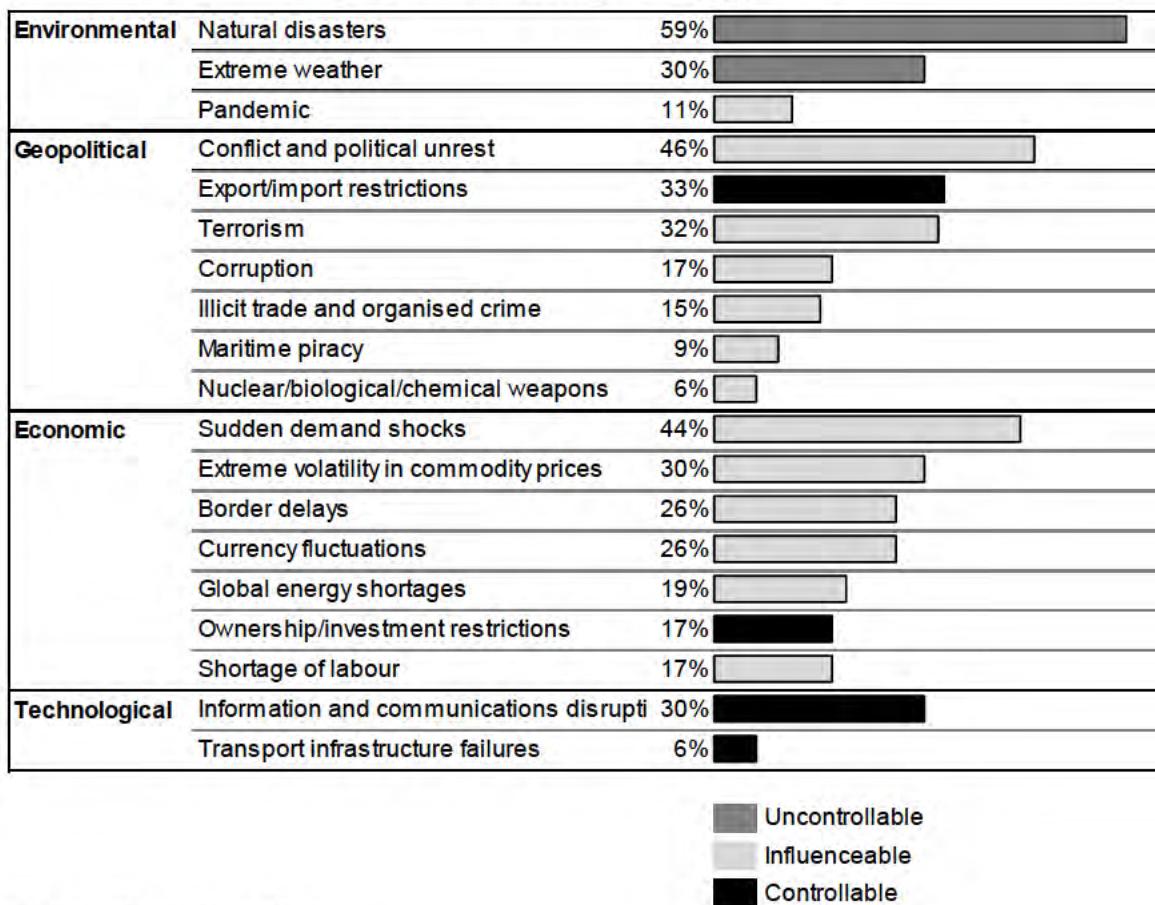
*This is leading to a search for more robust, flexible and resilient supply chains, ...*

Breakdowns in GVCs mainly affect individual firms, and they are therefore first in line to manage supply chain risks. They increasingly want supply chains that can withstand a variety of different scenarios and means of complementing “just-in-time” approaches with “just-in-case” strategies. While such solutions may not always offer the lowest-cost option, they help safeguard firms’ profitability and viability. The overall objective in supply chain management is to increase the robustness (i.e. the ability to quickly regain stability after a shock), the flexibility (i.e. the ability to change according to a set of predefined contingency scenarios), the agility (i.e. the ability to change when scenarios fail) and the resilience (i.e. the ability to reinvent the chain when conditions change) of GVCs.

*...including inventory management, diversification of suppliers and less complex supply chains.*

The global disruptions of GVCs in the aftermath of the Japanese earthquake/tsunami (and other natural disasters) are expected to reinforce this search for less vulnerable GVCs, thereby reorienting sourcing strategies of firms towards more diversification of risk. Companies are likely to reconsider how concentrated their supply chains are in terms of numbers of suppliers but also their geographical concentration to see how well they would handle unforeseeable events such as natural disasters, geopolitical risks, etc. (Figure 13), only some of which can be controlled or influenced. They seek a trade-off between efficiency and cost reduction, on the one hand, and risk diversification and redundancy, on the other, by holding larger (critical) inventories, encouraging suppliers to spread their production facilities geographically, switching parts of orders to (smaller) second-source suppliers, and breaking GVCs up into shorter and less complex chains.

**Figure 13. Drivers of global supply chain risk**



Source: World Economic Forum (2012).

*Firms are also exploring how to balance costs savings and risks.*

The recent trend towards “back-shoring” or “near-shoring” is also motivated by company strategies to better balance cost savings and risk dispersion in GVCs. In order to diversify the risks inherent in their supply chains, companies now look to shorter and alternative GVCs for the same product. In addition to GVCs in low-cost countries, companies establish GVCs in higher-cost countries close to their major markets. Other important motivations for back-shoring are the rising costs of production in emerging economies, concerns about protection of IPR, and the greater operational flexibility that shorter supply chains offer for adjusting to rapidly changing demand.

*Governments often play a limited role in these decisions ...*

The role of the government in managing supply chain risks may appear rather limited, as decisions regarding the length of the chain and the number of alternative suppliers is a business matter. It is hard to envisage governments prescribing minimum levels of critical inventories or minimum numbers of suppliers across different geographical entities for the day-to-day chain management within companies. However, from a national security point of view, security of supply can play a role if a country risks becoming dependent on one (or a limited number of) foreign supplier(s) in an area considered of strategic importance. In such cases, governments may consider developing a minimum stock or inventory, as is the case with oil supplies. The United States launched in January 2012 a National Strategy for Global Supply Chain Security to promote the efficient and secure movement of goods and to foster a resilient supply chain, in which IPR is also well protected.

*... but can contribute to information exchange with the private sector, awareness raising and encouragement of responsible business conduct.*

Co-operation and information exchange with the business sector could be particularly helpful for raising awareness of GVC risk (e.g. for SMEs), exploring different scenarios and developing appropriate solutions, ensuring that the regulatory and planning environment addresses important risks, etc. Codes of conduct that spell out mechanisms and rules for preventing and mitigating GVC risk could be one outcome of such public-private co-operation. They could be inspired by global initiatives such as the OECD Guidelines for Multinational Enterprises, which contains a set of voluntary principles and standards for responsible international business conduct.

*More systematic insights on the nature of GVC networks can support better policies.*

Disruptions in GVCs can seriously damage national economies, and governments will benefit from more systematic insights on the position of their country in GVCs. Countries downstream in a GVC – i.e. closer to final consumers – are relatively more vulnerable to adverse supply shocks upstream in the value chain, as this may endanger their supply of final and intermediate imports. Network analysis can be used to evaluate vulnerability. Countries higher up in the value chain – i.e. further away from final consumers – typically import demand shocks through their exports to countries further down the chain. If a higher share of domestic value added ends up in the final demand of other countries, countries are more vulnerable to demand shocks from abroad. In Mexico and Canada, for example, about 60% of domestic value added destined for exports ends up in final demand in the United States, so that a demand shock in the United States will have an important impact on these countries. In most OECD countries, the top five (final) destination countries typically represent around 40% of domestic value added.

*Pushing back globalisation is not the right response to these emerging risks, ...*

In contrast to their limited role in managing supply chain risks, government has a role to play in managing a range of other systemic risks, many of which are influenced by globalisation, e.g. food security or global pandemics. One option, discussed in some quarters, is to (try to) push back globalisation in order to curtail potential global channels of contagion. This ignores, however, the widespread benefits that globalisation has brought to millions of people across the world in terms of economic growth, rising incomes and employment. Furthermore, globalisation can help to reduce risk as it allows countries and firms to diversify away from individual unsystematic risks (economic integration increases the number of customers/suppliers across different countries and thus spreads countries' and firms' exposure).

*... but there is an important role for multi-stakeholder co-ordination ...*

It is also clear that the systemic character of global risks requires a multi-stakeholder approach, with governments, the business sector, international organisations, academia and others working together across national borders. Based on expert views from various fields and sectors, foresight (instead of pure forecasting) exercises could provide various scenarios about the future that take into account the complexity and uncertainty of possible risks and shocks. For some categories of systemic risk, the objective will be to reduce the vulnerability of systems to risk, while for other risks, particularly those with very low probability or unforeseeable, the question will be less about mitigation than about managing the risks and the consequences.

*... and the building of global capacities ...*

Action could also be taken to build up global capacities to understand and assess systemic risks before future events actually occur. Building databases on global interconnections and developing models that identify vulnerable hubs in systems are a first step in determining the likelihood of events that could disrupt complete systems. Given that some of these shocks happen very infrequently, a broad range of data will be needed to estimate probabilities and develop scenarios about potential events. Estimates of the costs of these global shocks, including the direct and indirect effects, are needed to guide government action.

*...including adequate contingency planning and proportionate precautionary measures.*

Finally, the benefits and costs of (re-)regulation have been strongly debated in global policy discussions in the aftermath of the 2008 financial crisis. Effective regulation to help prevent systemic risk that results in global crises is very difficult as crises are non-linear events (they occur without much warning) that are often not easy to detect. Opponents of regulation argue that lack of information will make regulation prone to error and largely counter-productive. However, doing nothing risks being very expensive if a global crisis does occur. More positive views towards regulation refer to the potential benefits of prudential measures such as “alarms, breakers and cushions”. The monitoring of risks includes the implementation of alarms (surveillance and early warning systems to detect countries’ exposure to global systemic risk at an early stage). Breakers can curb contagion and prevent different parts of the system from being seriously affected once a shock risks affecting the system. If alarms and breakers do not suffice, cushions are intended to soften the blow to the system by holding strategic reserves. Adequate contingency planning and proportionate precautionary measures can also help mitigate contagion.

## **Looking ahead – national policy in an interconnected world**

*Global value chains will continue to evolve ...*

If there is one overarching implication of this report, it is that global value chains are very dynamic and will continue to evolve as costs increase, technologies continue to change, and firms reconsider their operations. For example, in recent years, some US firms have brought certain activities back to the US market, owing to cost increases in emerging and developing economies, changing perceptions of the stability of value chains, and new technologies that enable more tailored production closer to the home market. At the same time, new value chains are appearing and strengthening networks linking emerging and developing economies, sometimes with only a limited role for firms from advanced economies. This may offer new opportunities for countries that have thus far not been integrated in GVCs.

*...raising new challenges for national policy makers in an increasingly interconnected world.*

The dynamic nature of GVCs also implies that the specialisation and comparative strengths of economies will continue to evolve, which will require further adjustment at the national level. More fundamentally, national policy makers will continue to be challenged by the global nature and operation of value chains. This will increasingly require more international co-operation and co-ordination among governments. Moreover, informed policies related to GVCs will require good data and analysis. Further work is required in many areas, e.g. to measure the role of investment in GVCs, or the impacts of GVCs on employment, skills and incomes.

*This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.*

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