

# The Rise of International Supply Chains: Implications for Global Trade

Global Agenda Council on the Global Trade System

Two broad, contradictory trends are at work in the global economy. First, economic globalization through multinational corporation (MNC) production networks continues apace. This dynamic promotes global economic convergence and integration. The global value chains that the MNCs operate have become the world economy's backbone and central nervous system.

The increasing importance of global production chains is reflected in the rising trade in intermediate inputs, which now represent more than half of the goods imported by economies in the Organisation for Economic Co-operation and Development (OECD) and close to three-quarters of the imports of large developing economies, such as China and Brazil.<sup>1</sup> Imported inputs also account for a significant chunk of exports, blurring the line between exports and imports as well as between domestic products and imports. As part of global production chains, products at different stages of value-added may be imported and re-exported multiple times, increasing the size of reported exports and imports relative to global and national value-added. In advanced countries, this effect is reinforced by the fact that imports can contain a significant portion of inputs—including intellectual property, brand development, and so on—originally sourced at home; in developing countries, imports of components and machines are crucial vehicles for the absorption of technologies.

According to OECD estimates, imported intermediate input content accounts for about one-quarter of OECD economies' exports, and the European Central Bank (ECB) estimates that such imports accounted for about 44 percent of EU exports (or 20 percent for imports from outside of the European Union) in 2000, ranging from about 35 percent in Italy to about 59 percent in the Netherlands.<sup>2</sup> In the United States, imported intermediate input content in exports reached about 10 percent in 2005. Among emerging economies, imported content's share in exports is particularly high in China—about 30 percent, or twice that of India and Brazil.

With globalization, the use of imported intermediates for exports has been growing.<sup>3</sup> According to the OECD, all but one of its 34 member countries increased the import content of its exports over the period 1995–2005. The increase was particularly marked in small countries such as Israel and Luxembourg, which saw increases of about 20 percentage points, compared with 3–8 percentage point increases in large countries such as Germany, Japan, and the United States. This is in keeping with the general trend of import content accounting for a larger share of exports in smaller economies.

However, the second trend, which pertains to economic crisis policy responses, is one of divergence.

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This chapter provides a summary of the key points highlighted by the report of the World Economic Forum's Global Agenda Council on the Global Trade System entitled *The Shifting Geography of Global Value Chains: Implications for Developing Countries and Trade Policy*. The full report is forthcoming and will be available at [www.weforum.org/getr](http://www.weforum.org/getr).

Associated with this is the ever-present threat of a destructive spiral of protectionism and consequent disintegration. Such an escalation would have serious consequences for the global economy, particularly the most vulnerable and trade-dependent states, and highlights the critical role the World Trade Organization (WTO) has played in stemming the tide of protectionism. Unfortunately, WTO member states remain unable to conclude the Doha Development Round, throwing the WTO's continued centrality to the global trading system into sharp relief. Fortunately, the resilience and increased interdependence of the global economy has also played a key role in containing protectionism: governments quickly realized the futility of discriminatory stimuli and the cost of raising barriers on intermediate goods on which whole segments of domestic industries depend.<sup>4</sup>

However, fundamental changes to global value chains are taking place. In the next decade, the underlying cost structures driving value chain location could change dramatically. At least five drivers are evident:

1. Energy and associated transportation costs are likely to continue rising as the cost of fossil fuels increases and policy measures targeted at carbon emissions intensify. The fracas over airlines associated with the European Union's emissions trading scheme is an early harbinger of the kinds of issues that may arise. These cost pressures promote reductions in the "length" of value chains.
2. In the same way, as new players from emerging markets secure access to various resources for input into production processes, competition will increase and the prices of those resources are likely to rise. Export restrictions designed to secure domestic supplies of key industrial inputs—both agricultural and mineral—if not properly regulated, are also likely to intensify, thus placing further upward pressure on prices.
3. China is at the center of global value chains in manufacturing, particularly in labor-intensive sectors. But as China continues to shift its growth model away from a reliance on exports toward domestic consumption, wage costs are likely to rise sharply and the currency should continue its appreciation. Other domestic costs, such as land, are also rising. Hence the "China cost" is likely to continue mounting. To be sure, there are moderating forces. Cost pressures can be mitigated by productivity growth, which in the Chinese case has been rapid. Moreover, the western provinces still have hundreds of millions of workers eager to join the "new China," so some caution is appropriate in predicting sharp changes.
4. Information technology costs are likely to be driven down through intense technological competition and innovation. This drop in costs opens up opportunities for countries wishing to take advantage of the value chains action.
5. Southern markets will continue to grow in relative importance, while growth in Europe is likely to remain structurally repressed for the foreseeable future. This imbalance is likely to drive value chain reorientation and relocation, potentially in unpredictable ways.
6. Investment in infrastructure could be added to the list of potential drivers of change.

For these reasons, the geography of value chain location is likely to shift, potentially fundamentally, within the next decade. This has major implications for those countries that have specialized in value chain niches, and for developing countries looking to secure new niches. The geographical shift will play out differently in different contexts: developed countries are increasingly concerned about retaining jobs; some developing countries are attempting to retain their existing value chain niches, while others are trying to establish value chain niches for the first time.

These dynamics will drive unilateral trade policy responses centered on promoting competitiveness, efficiency, and attractiveness to value chain investments. In addition, the international rules governing value chain operations need to be revisited with a view to updating them so that the new emerging context can evolve optimally. Those rules apply at two levels: at the regional level, with preferential trade agreements (PTAs), and internationally, in the WTO.

Consequently, the World Economic Forum's Global Agenda Council on the Global Trade System (the Council) decided to consider these matters in more detail; the Council's report, *The Shifting Geography of Global Value Chains: Implications for Developing Countries and Trade Policy* presents these efforts. The present chapter summarizes the main contributions of that report; then we provide some overall recommendations.

## THE EMERGENCE OF SUPPLY CHAINS AND THEIR IMPLICATIONS FOR GLOBAL TRADE RULES

The main historical shifts in industrial location began with the industrial revolution in Britain and subsequently spread to Western Europe, particularly Germany, and later to the United States, which developed an "American management" based on "scientific" techniques. An alternative tradition, based on a different "scientific management" paradigm, developed in the Soviet Union but ultimately failed owing to the many shortcomings of command economics. Subsequently Japan perfected its "compete out/protect in" model, which was centered on giant *keiretsu* rather than value chain dispersion through arms-length relationships. The South Korean *chaebol* then adopted the Japanese compete out/protect in model, with the significant exception of their ongoing sourcing of parts and components from outside the *chaebol*, particularly from Japan. Taiwan, China, by contrast, developed its industrial structure from the bottom up on the basis of small and medium enterprises supplying parts and components to large corporate

original equipment manufacturers from Europe and the United States as the process trade expanded into East Asia. As labor costs in South Korea and Taiwan, China, rose, they too shifted production within the region and so China became the latest and most significant beneficiary.<sup>5</sup>

A different set of dynamics underpinned the emergence of global value chains in recent decades. The “first great unbundling” took place in the 19th century as steam power drove innovations in shipping and railroads, thereby radically lowering transportation costs. That drop in costs enabled the spatial separation of production and consumption, while scale economies and comparative advantage promoted the unbundling process. Thus goods were made in one country and shipped to consumers in another. Accordingly, economic policies and trade rules were designed on the basis of national perspectives, in a world of selling goods.<sup>6</sup>

The first unbundling required on-site coordination of production and distribution. The 1980s information and communication technologies (ICT) revolution promoted decentralization of information flows and therefore the second great unbundling, whereby production stages were dispersed to geographically distinct locations, thus harnessing comparative advantage and scale economies. This process gave rise to what Baldwin calls “21st-century trade,”<sup>7</sup> or the trade-investment nexus. That nexus encompasses trade in parts and components; international investment in production facilities and associated material and non-material inputs; and strong demand for a range of services to coordinate dispersed production processes. This diversity and interconnection of wide-ranging elements enabled firms to combine their high technology with foreign workers.<sup>8</sup>

China typifies these forces par excellence. China’s success in global value chains is rooted in the ICT revolution, which greatly promoted production dispersion and undercut tight vertical control as exercised by Japan’s industrial *keiretsu*. Simultaneously a global market emerged for the first time because the communist bloc collapsed and developing countries pursued unilateral trade liberalization. China’s success resembled the Taiwanese model rather than Japan’s, with a key difference being its openness to foreign direct investment (FDI) in order to pursue compressed development at a rapid pace.<sup>9</sup>

However, nothing is pre-ordained. Japan dominated global manufacturing in the 1980s, just as the Europeans (excepting Germany) and the United States had before decline inevitably set in. In this context, it is likely that China will encounter several challenges in the future. First, external market dynamism is undoubtedly repressed in the wake of the global financial crisis—a major problem for China’s export-led model. Second, the docile rural-sourced labor force that fueled the initial wave of industrialization in the country is giving way to a younger urban labor force with higher expectations. Third, there is great desire in the leadership to promote more value-addition in China and thus to alter the terms of the compressed development model. These pressures

are captured in the Chinese 12th Five Year Plan, the outcome of which remains to be seen.

The services dimension of global value chains is equally important. Services provide the link at each point of the manufacturing value chain, without which they could not function. These enabling services, particularly business and ICT services, have grown the fastest in world services trade and collectively constitute “other commercial services.” More open services markets allow for more efficient or higher-quality distribution or logistics services, thus enabling greater participation in global value chains and world trade. Similarly, better functioning infrastructure services, such as transport, reduce the average times needed to import and export thereby reducing costs while promoting efficiency and reliability. Furthermore, a key objective for MNCs is to shift from manufacture and assembly into design, innovation, research and development, logistics, marketing, and branding. In this way, intangible things are becoming increasingly important in global value chains.<sup>10</sup>

Services themselves are being unbundled and traded as tasks. The quintessential examples are back-office and data processing services, but other services such as research are also being unbundled and traded across national borders. Developing countries wishing to capture a share of services value chains may find it easier to capture one or more tasks in the chain, rather than attempt to compete along the entire spectrum.

As with manufacturing value chains, the key challenge for MNCs is to move up the services value chain. This requires strong human capital and electronic infrastructure. It also requires open trade and investment policies to promote the competitive provision of such services. Regulatory simplicity and efficiency, key components of a good governance paradigm, are essential. And regulatory modal neutrality—allowing MNCs to switch freely between modes of supplying services and to combine them when necessary—is a key enabler. All this needs to be underpinned by quality institutions, which in turn affect the regulatory environment.<sup>11</sup>

Giant manufacturing MNCs also tend to depend on services inputs. One example is General Electric’s global web of research centers, through which globally integrated innovation is pursued in a 24-hour production cycle made possible through advanced ICT linkages. General Electric also has to provide maintenance and other services to its huge global network.<sup>12</sup>

What do big MNCs look for when taking their locational decisions? Such investment decisions are not taken lightly, especially in a technology-intensive company such as General Electric; rather they tend to be significant resource commitments that are not easily abandoned. In other words, firms such as General Electric make a long-term forecast of location conditions before locating a facility, and once the location decision is made, it is not easily changed. These decisions are not based simply on cheap labor costs, or firms would be flocking to Haiti and Congo, which they patently are not. Rather, productivity is the key labor issue.<sup>13</sup>

There are four key enabling elements or factors that must be in place for making location decisions. The first factor is the potential of the local market—“the business case is simply more compelling when the country at issue represents a large or potentially large market.”<sup>14</sup> The second factor is the availability of suitable human resources. For a technology-intensive company, productivity is more important than labor cost; for design-intensive activities, access to the best possible knowledge is critical. The third factor is the availability of physical infrastructure. And the fourth, and most crucial, factor is the strong and conducive legal and policy environments that embed the rule of law.

Absent these conditions, MNCs will be reluctant to fully commit to the market in question. An emerging challenge is the trend toward promoting technology transfer through policy intervention in value chain location decisions, such as “buy local” or “indigenous innovation” policies as a precondition for access to procurement markets. It can be argued that MNCs will be reluctant to commit to markets with these preconditions, particularly if the four enabling elements are not satisfied. By contrast, or perhaps partly because of this trend, US MNCs are increasingly “on-shoring” their investments back into the United States, since the country provides the four key elements.<sup>15</sup>

The case is very different when considering the labor-intensive apparel industry, with reference to sub-Saharan Africa. Clothing is one of the most traded commodities worldwide, and it is particularly sensitive to government policies governing trade, especially exchange rates. Nonetheless, it is possible to identify potential opportunities for African countries to plug into niches in the global value chains that characterize this intensely competitive industry, particularly labor-intensive garment manufacturing. In order to do so, such countries need to harness the abundant pool of young, semi-skilled labor available at comparatively low wages; develop existing comparative advantages in the production of high-quality cotton with favorable fiber characteristics; and tap into the huge potential reservoir of renewable energy resources available on the subcontinent to power energy-intensive textiles production cycles.<sup>16</sup>

For these African countries to take advantage of this opportunity, several conditions need to be satisfied. One key barrier is that markets remain fragmented, and this fragmentation has inhibited the development of competitive clothing and upstream textiles. It follows that regional integration focused on reducing transactions costs is a key imperative—in other words, PTAs matter. More importantly, domestic governance reforms aimed at establishing quality public institutions that will deliver sustained economic, social, and environmental performance, thereby boosting investor confidence, are critical. These will take African countries beyond their current reliance on access to preferential trade schemes offered by developed countries into sustainable competitiveness.

The growth of global value chains has four broad implications that are represented by the growing share of

intermediate inputs in world trade. The first implication is that the importance of bilateral trade balances is greatly exaggerated, because they do not reflect value-added. This understanding has major political implications. For example, some estimates place China’s trade surplus with the United States between 20 and 40 percent lower than official data suggest, whereas Japan and South Korea’s balances with the United States may be understated since China is a key plank in their companies’ processing trade.<sup>17</sup>

Similarly, services are not adequately captured in official trade statistics—one recent estimate reckoned that services account for 40 percent of world trade on a value-added basis rather than the currently estimated 20 percent.<sup>18</sup> Unfortunately, although trade economists seem to be in broad agreement about the need to incorporate value-added and better measures of services trade into trade statistics, it is a very complex undertaking that is unlikely to gain traction soon. Nonetheless, the need to establish better data and better measures deserves a great deal more official support and resources.<sup>19</sup>

The second implication of global value chain growth is that the importance of exports as a driver of demand is overestimated, while the importance of trade as a source of economic efficiency is underestimated. Essentially, policymakers fail to recognize that exports depend on imported inputs, whereas exported inputs feed into others’ imports. Furthermore, imports are a critical channel through which developing countries absorb technology.<sup>20</sup>

The third implication is that trade has become more volatile and a larger source of external shocks, largely owing to the fact that durable goods trade has grown rapidly and demand for durable goods fluctuates more than that for other tradables (goods or services). Furthermore, since countries are increasingly specialized in certain manufacturing niches, external shocks are more rapidly transmitted through trade in durable goods. The answer to this danger, however, lies not in reducing trade, but in building better safeguards against financial instability and fostering more trade cooperation at the multilateral level. The flipside of increased external vulnerability is reduced vulnerability to domestic shocks.

Fourth, in addition to these negative implications, the cost of protection is now higher than generally understood, and rising, especially for smaller economies where the share of intermediate imports in exports is large. This underscores the growing importance of trade facilitation in its broadest sense—to reduce transaction costs associated with intermediate trade, and thereby plug countries into global value chains more effectively.<sup>21</sup>

## IMPLICATIONS FOR DEVELOPING COUNTRIES AND TRADE RULES

It is clear that governments need to recognize that exports are only part of the development story. It is important for policymakers to develop better measures of trade flows net of intermediate imports, and more generally to develop a better appreciation of how a particular economy fits into global production chains.

Failure to do so can lead to inaccurate policy conclusions about the importance of bilateral trade imbalances, to significant underestimates of the cost of protection, and to a lack of appreciation of the importance of bilateral or regional trading relationships. Generally, the existence of large and growing trade in intermediates, which is associated with FDI and the globalization of production, greatly raises the stakes for countries to have open and predictable trade and investment regimes, including efficient logistics. If they do not adopt this perspective, then “old” policy approaches can have serious consequences. For example, trade remedies often backfire by frustrating the efficiencies occasioned by intermediate trade, disrupting supply chains, and costing domestic jobs when the aim of applying trade remedies is to save them.

This is inherently a *unilateral perspective*. The developments described in *The Shifting Geography of Global Value Chains* report present challenges for industrial policies and require new thinking. Although it may be attractive to some policymakers and domestic constituents to promote import replacement or restrict exports for industrial policy reasons, such policies will inhibit both trade in intermediates and inward investment into value chain niches. For example, these developments point to the serious inaccuracies that occur when products and trade balances are classified as “high-tech” or “technologically intensive” with a view to drawing implications for industrial policies or indicating technological prowess. For instance, the United States is said to have large deficits in “advanced technology” products with many developing countries, especially China. Yet the failure to appreciate that US imported products that are attributed to developing countries may actually contain large amounts of value-added elsewhere—indeed in the United States—leads to seriously erroneous conclusions. More generally, the chains pose difficulties for industrial policies because industries have become more fragmented and unbundling suggests that they are not necessarily appropriate units for policy analysis. The more often products cross borders in the course of their manufacture, the more significant trade facilitation policies become. If only 20 percent of the value of the final product is produced in a country, a 5 percent trade cost is the equivalent of a 25 percent tax on that activity.

However, an open trade regime is not enough on its own to benefit from being inserted into global value chains. Countries need to invest in horizontal policy measures—notably education, infrastructure, and technology transfer—in order to enhance access to global value chains and the long-term benefits they offer. Domestic governance and institutional reform are also essential preconditions, particularly in developing countries. MNCs pay close attention to these softer issues when making long-term decisions about where to locate key aspects of their global value chains.

Currently the rules that govern global value chains are based on the first unbundling, or the notion that firms in one nation sell things to customers in another nation. Hence the rules framework concerns product-trade

rather than process-trade. As such, these rules do not account for a range of policies and barriers that do not inhibit selling things per se, but do hinder moving things. This problem afflicts the WTO in particular, which has struggled to advance beyond its traditional focus on market access barriers to trade in goods. The global nature of today’s production chains; the intermingling they imply of exports of services, goods, and movement of capital and of specialized workers; and the essential role played in them by efficient trade logistics all point to the increased importance of comprehensive multilateral disciplines to facilitate the operation of such chains. The WTO’s contribution potentially spans services, intellectual property, trade facilitation, and tariffs on imported inputs. Furthermore, trade and investment are two sides of the same economic coin: trade rules cannot work without investment rules—and vice versa.

Unfortunately our global trade rules fall considerably short of the 21st century, and our global investment rules are, regrettably, nearly nonexistent. Furthermore, value chains evolved historically as Southern export platforms to service Northern markets, but now we are seeing shifts in Southern locations and increasing targeting of other southern markets. Yet the Doha Round is largely predicated on a North-South negotiating dynamic. As value chain relocation takes hold, driven by emerging-market growth, so the new dynamics need to be reflected in the way the WTO conducts its business. This argues for concluding the outstanding agreement on trade facilitation at the WTO as soon as possible, so that some of the logistical barriers to the operation of global value chains can be removed and the costs lowered. Despite the stasis in the Doha Round, a positive outcome on a trade facilitation agreement would go very much in the right direction to facilitate the 21st-century paradigm of world trade.

These issues raise an obvious question: how can WTO rules be advanced in the absence of a conclusive multilateral trade round? In the perspective of the Council, the key to this is for the WTO’s membership to pursue *plurilateral*, or small group, negotiations under the auspices of the WTO.<sup>22</sup> The politics of this approach are challenging, but the systemic implications of continued stasis in the WTO are arguably worse.

Two further implications relate to services trade and investment. First, trade rules should be updated to promote modal neutrality in services trade and investment. Specifically, modes 1 (cross-border trade) and 3 (cross-border investment) should be open and therefore facilitate modal switching. Second, regulators need to promote regulatory coherence across borders so as not to establish bottlenecks in the value chain creation process. This could be done through the adoption of general or sector-specific principles, or both.

Given these problems with updating WTO rules, trade rules have advanced faster in PTAs than within the multilateral framework or related vehicles such as bilateral investment treaties. Production chains are even more intense at the regional level, and regional agreements can more easily deal with the complexity they imply—pointing to regional negotiations as an

important complement to multilateral disciplines. Nonetheless, PTAs could add to transactions costs in the absence of multilateral disciplines advancing in the WTO. Furthermore, PTA rules are based on an antiquated understanding of where goods are “from”—hence the Byzantine networks of “rules of origin.” But goods are now “from” everywhere—because of global value chains. In a world of supply chains, the least-developed countries have increased opportunities to enter into processing activities, potentially on a large scale, but this implies their adding relatively small amounts of value-added to any particular product. Under these circumstances, rules of origin that require 30 or 40 percent of local value-addition or an extensive array of local production processes—such as yarn-forward rules for clothing—may well preclude underdeveloped countries from taking advantage of such opportunities. This would mean that such assembly operations would not qualify under many rules of origin for preferential treatment. Rules such as those developed in the African Growth and Opportunities Act, which allow much greater use of imported inputs by the least-developed countries, are needed to avoid this problem.

Therefore new approaches to negotiating PTAs, with a view to making them more compatible with actual global value chain operations and ultimately WTO disciplines, are also required. At the very least it suggests an approach rooted in reducing transactions costs, not raising new barriers to trade. A key question is how these bottom-up changes could be incorporated into the WTO’s architecture. The Council’s recommendations in this regard are available in its report on PTAs.<sup>23</sup>

## NOTES

- 1 This section is based on articles by Shimelse Ali and Uri Dadush in Carnegie’s International Economics Bulletin (Ali and Dadush 2011a) and in VoxEU (Ali and Dadush 2011b).
- 2 This estimate is based on five European economies—Germany, Italy, the Netherlands, Austria, and Finland—which account for around 60 percent of euro area GDP. See ECB 2005.
- 3 For details of the calculation and sources of data, see Dadush 2012.
- 4 IBRD/World Bank 2010, pp. 10–11.
- 5 Lehmann 2012.
- 6 Baldwin 2012.
- 7 Baldwin 2012.
- 8 Baldwin 2012.
- 9 Lehman 2012.
- 10 Stephenson 2012.
- 11 Stephenson 2012.
- 12 Bhatia 2012.
- 13 Bhatia 2012.
- 14 Bhatia 2012, forthcoming.
- 15 Bhatia 2012.
- 16 Ismail 2012.
- 17 Dadush 2012.

- 18 For the underlying data source, see the US Bureau of Economic Analysis, based on Stephenson 2012.
- 19 Stephenson 2012.
- 20 Dadush 2012.
- 21 Dadush 2012.
- 22 See the World Economic Forum, Global Agenda Council on Trade 2010 report on plurilaterals, available at [http://www3.weforum.org/docs/GAC10/WEF\\_GAC\\_Trade\\_Paper\\_2009-10.pdf](http://www3.weforum.org/docs/GAC10/WEF_GAC_Trade_Paper_2009-10.pdf).
- 23 See the World Economic Forum, Global Agenda Council on Trade 2011 report on PTAs, available at [http://www3.weforum.org/docs/GAC11/WEF\\_GAC\\_Trade\\_Paper\\_2011.pdf](http://www3.weforum.org/docs/GAC11/WEF_GAC_Trade_Paper_2011.pdf).

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