

Brazil in Global Value Chains: Implications for Trade and Industrial Policy

By Timothy Sturgeon, Gary Gereffi, Andrew Guinn, and Ezequiel Zylberberg¹
Article for Funcex Magazine, draft May 21, 2013

THE RISE OF GLOBAL VALUE CHAINS

In recent years, many industries have changed from nationally bounded entities to organizationally fragmented and globally distributed business networks consisting of "lead firms" (OEs) and — often globally operating — suppliers and service providers. Because of this, countries and regions can specialize in specific aspects of production, rather than complete industrial sectors. For example, a host of high volume consumer products are designed in the USA, Europe, or Japan and manufactured in China, Eastern Europe, or Mexico. Inputs flow in from dozens of countries, and finished products are sold locally and exported to markets worldwide. Such patterns exist in a wide range of good-producing industries such as electronics, apparel, household goods, and even in services and software. These new global production systems are commonly referred to as "global value chains," or GVCs. In international trade, GVCs are most evident in growing intermediate goods trade and the rise of important new players in the global trade regime, most notably China.

After 1989, the breakup of the Soviet Union, the opening of China to international investment and trade, and the liberalization of India and Brazil opened these "BRIC" nations more fully into international trade and investment.² This influenced the globalization process, since these giant economies offered seemingly inexhaustible pools of low-wage workers, capable manufacturers, abundant raw materials, and large domestic markets. This first wave of emerging economies soon became deeply engaged with GVCs, although their specific roles varied according to their openness to trade and foreign investment; endowments of natural, human, and technological resources; and their geopolitical relationships to the world's most powerful countries and their immediate neighbors. China became the "factory of the world," India the world's "back office," agricultural commodities and mineral exports from Brazil skyrocketed, and Russia drew from

¹ Dr. Timothy Sturgeon is Senior Research Affiliate at the Massachusetts Institute of Technology's Industrial Performance Center; Dr. Gary Gereffi is Professor of Sociology and Director of the Center for Globalization, Governance, and Competitiveness at Duke University; Andrew Guinn is a doctoral candidate in the Department of City and Regional Planning at the University of North Carolina at Chapel Hill; and Ezequiel Zylberberg is a doctoral candidate at Oxford University's Said School of Business.

² Jim O'Neill (2011), the Goldman Sachs executive who coined the term BRIC in 2001 to refer to Brazil, Russia, India and China, now argues that there is a much larger number of "growth economies" (BRICs plus 11) that fall into this category. These include the MIST nations (Mexico, Indonesia, South Korea and Turkey), and other periodic high-performers such as Bangladesh, Egypt, Pakistan, the Philippines, and Vietnam (Martin, 2012). The original BRIC classification was extended to BRICS with the addition of South Africa in 2010. For purposes of this paper, the origin of these acronyms is less important than the collective effect of this set of so-called emerging economies, which are reshaping both supply and demand in many GVCs.

enormous reserves of natural resources plus the military technologies, scientific expertise, and software capabilities linked to its role as a Cold War superpower to become an important player in the global trading system.

Since 2001, the shift in production from North to South in the global economy has accelerated, and an expanding number of relatively large high-growth economies are playing prominent roles in a wide variety of industries, both as exporters and as new markets (O'Neill, 2011). This reflects multiple factors, including the growing significance of domestic markets in large emerging economies (relative to slow growth in advanced markets) and renewed efforts to cut operating costs in the wake of the global economic crisis of 2008-09 (Cattaneo *et al*, 2010).

One of the defining features of GVCs since their earliest emergence in the early 1970s is that exports of final goods are increasingly composed of imports of complex, customized, and product-specific intermediate goods. As supply chains go global, more intermediate goods are traded across borders, and more parts and components are imported for use in exports (Feenstra, 1998). In the 1990s, as the scope of GVCs expanded dramatically with the opening of the BRIC countries, trade in customized intermediates began driving overall trade in intermediate goods higher, and after 2001 the share of intermediate goods in total trade accelerated further (Sturgeon and Memedovic, 2010). By 2009, world exports of intermediate goods exceeded the export value of final goods, reaching 51% of non-fuel merchandise exports (OECD, 2011; WTO and IDE-JETRO, 2011; UNCTAD, 2013; World Economic Forum, 2013).

WHERE DOES BRAZIL STAND IN GVCs?

When considering Brazil's role in GVCs, it is useful to consider the country's relative position within the BRIC group of countries. The Brazil-China bilateral relationship, in particular, has highlighted changes in Brazil's role in the global economy, such as the so-called "primarization" of Brazilian exports, whereby huge demand from China has shifted Brazil's export profile toward primary products with relatively low levels of processing. It has long been a central challenge for Brazil to increase the technological content of its exports in order to upgrade to higher value activities in both the primary product and manufacturing sectors, but now, with the trend heading in the opposite direction, diversification, technological learning, and industrial upgrading have increased urgency.

As GVCs have expanded in scope and complexity, emerging economies have clearly benefitted, surging ahead of the advanced industrial countries in terms of export performance. Between 1995 and 2007, the global export market shares of the United States and Japan fell by 3.8% and 3.7%, respectively, while China more than doubled its market share from 4% in 1995 to 10.1% in 2007, making it the world's export leader (ahead of Germany, the United States and Japan). South Korea, Mexico, Turkey, South Africa, and the former transition countries in central Europe also increased their export market shares during this period. Even more surprising, emerging economies made their most significant gains in high and medium-technology industries, which previously were the stronghold of OECD countries. This phenomenon was mainly driven by

processing exports from China, whose share of high technology exports soared by 13.5% in the period 1995-2007, moving it ahead of the United States as the world's largest exporter of electronics (Beltramello *et al.*, 2012: 9-10). .

It is hard to overstate the importance of China in GVCs. China's exports (\$1,899 billion in 2011) are more than three times that of South Korea (\$557 billion), its nearest rival among the emerging economies, and only slightly less than the combined exports of South Korea, Russia (\$516 billion), Mexico (\$350 billion), India (\$303 billion), and Brazil (\$256 billion). China has grown at over 9% per year for over 30 years, and it is now the second-largest economy in the world (trailing only the United States) and it has overtaken Germany as the world's largest exporter (Beltramello *et al.*, 2012). This has had a major impact on Latin American economies, of which Brazil is the most significant. In 2010, China was Brazil's largest trading partner, accounting for about 15% of Brazil's exports and imports. Between 2000 and 2010, Brazil's exports to China increased almost thirty-fold, and since 2002, imports have grown sixteen-fold. Although the Lula administration was keen to develop a strong economic partnership with China, concern has arisen due to both the composition of Brazil's exports to China (the primarization of Brazilian exports mentioned earlier), and their concentration in a relatively small number of products and exporting firms. As seen in Table 2, about 70% of Brazil's global exports in 2011 were primary products or resource-based manufactures. Furthermore, these two categories accounted for just over 60% of Brazilian exports to countries other than China in 2009, compared to almost 90% to China. Brazil's exports to China are concentrated in a very limited number of products, with iron ore and soybeans alone accounting for over two-thirds of the total in 2009. This is reflected in Brazil's top 10 exports in 2011, where the top seven items are primary products or processed intermediates (see Table 3).

From a GVC perspective, what is particularly notable about Brazil's trading relationship with China is that it is skewed to the export of products (both primary commodities and manufactured goods) with a very low level of processing, while imports tend to be technology intensive components and machinery. The soybean value chain is a good example of the former. About 95% of Brazil's soybean exports to China in 2009 were unprocessed beans. In contrast, there were virtually no exports of soybean meal, flour or oil to China. In order to pursue its strategy of promoting the Chinese soybean processing industry, China imposed a tariff of 9% on soybean oil imports, while the tariff on unprocessed soybean imports was only 3%. More processed imported soybean products also paid a higher value-added tax rate in China than unprocessed beans. This same protectionist policy of tariff and non-tariff barriers imposed by the Chinese government to protect its domestic producers was applied to a range of other primary and processed intermediate products from Brazil, including leather, iron and steel, and pulp and paper (Jenkins, 2012: 28-29).

Table 1. Emerging Economies in Comparative Perspective, 2011

Country	Population (Millions)	Exports (Billions USD)	GDP (Billions USD)	GDP/capita (USD)	GDP/capita (PPP in USD)	GDP growth YoY (%)	Percent of GDP		
							Agriculture	Industry	Services
China	1,344	\$1,899	\$7,318	\$5,445	\$8,450	9.1	10	47	43
Brazil	197	\$256	\$2,476	\$12,594	\$11,500	2.7	5	28	67
Russia	142	\$516	\$1,858	\$13,089	\$19,940	4.3	4	37	59
India	1,241	\$303	\$1,848	\$1,489	\$3,620	6.9	17	26	56
South Korea	50	\$557	\$1,116	\$22,424	\$30,340	3.6	3	39	58
Mexico	115	\$350	\$1,115	\$10,064	\$15,060	3.9	4	34	62

Sources: World Bank: <http://data.worldbank.org/>; UN Comtrade, International Trade Center.

Table 2. Export profile percentages of emerging economies: 2011

Country	Primary Products	Manufacturing			
		Resource Based	Low-Tech	Medium-Tech	High-Tech
China	3	9	30	24	33
Brazil	32	37	5	19	4
Russia	45	27	2	8	1
India	11	39	21	17	8
South Korea	3	16	9	45	27
Mexico	20	8	9	38	22

Source: United Nations Comtrade, SITC Rev. 2.

Table 3. Brazil's Top Ten 3-Digit Export Products and Share of Total Export Profile, 2011

3 Digit SITC	Product	Billions \$US	% of Total Exports	Product Category
281	Iron ore and concentrates	\$41.8	16%	PI
333	Crude petroleum and oils obtained from bituminous minerals	\$21.6	8.4%	PP
222	Seeds and oleaginous fruit, whole or broken, for 'soft' fixed oil	\$16.4	6.4%	PP
061	Sugar and honey	\$15.0	5.9%	PI
011	Meat and edible meat offal, fresh, chilled or frozen	\$13.1	5.1%	PP
071	Coffee and coffee substitutes	\$8.7	3.4%	PP
081	Feeding stuff for animals (not including unmilled cereals)	\$6.0	2.3%	PP
672	Ingots and other primary forms, of iron or steel	\$5.2	2.0%	MT
784	Motor vehicle parts and accessories, nes	\$5.1	2.0%	MT
931	Special transactions, commodity not classified according to class	\$5.1	2.0%	Other
	Total Exports	\$256.0		

Notes: PP = Primary Product; PI = Processed Intermediate; LT = Low-Tech; MT = Medium-Tech; HT = High-Tech.
Source: United Nations Comtrade, SITC Rev. 2.

On the import side, Brazil has also been influenced by China's structure of international trade. In 1996, low-technology products accounted for 40% of Brazil's imports from China, while high-technology products accounted for 25%. By 2009, the pattern was nearly reversed: high-technology products were 41.4% of the total, and low-technology products were 20.8%. If we look at this trend in terms of the end use of imports, consumer goods imports from China to Brazil fell from 44% to 16% between 1996 and 2009, while the imports of capital goods and their parts doubled (Jenkins, 2012: 29-31). Thus, Brazil has been subordinated to occupy the lowest rungs of the value-added ladder in its trade with China in recent decades, which poses long-term structural imbalances for Brazil if the situation doesn't change.

It is worth stressing that, from a GVC perspective, which focuses on the location of value added in global production systems, high-technology imports from Mainland China are most often driven by the products and strategies of firms based in OECD countries, along with their business partners (e.g. trading companies, contract manufacturers, and component producers) based elsewhere in the world, especially Taiwan, Hong Kong, and Singapore. Thus, the historic reliance of Brazil on the "global North" for technology-intensive products has in essence remained, even as China's importance as a trading partner has risen. In other words, China has become a major conduit for technology from the global North.

Notwithstanding the unprecedented momentum of China's rise in the global economy, these competitiveness problems for Brazil can be ameliorated, or even reversed. Mexico, which is Latin America's second-largest economy, appears to be in the midst of a remarkable turnaround, based on a little publicized manufacturing revolution that is allowing the country to become a credible competitor to China, after losing U.S. market share to China for more than a decade (Gereffi, 2009). Mexico currently exports more manufactured products than the rest of Latin America combined, and it has begun to diversify its export profile, with exports to the United States falling from 90% of total exports a decade ago to less than 80% today.

The main elements of Mexico's success include a very high degree of trade openness – it has free trade agreements with 44 countries, which is more than twice as many as China and four times more than Brazil. Rising wages and fuel prices have made it increasingly expensive to export from China to the U.S. market. Mexico's wages, which used to be nearly four times higher than China's a decade ago, are just 29% higher today. Also, while Mexico still has an abundance of cheap labor (more than half of its population of 112 million is under 29), its workers are also becoming more skilled, with growing proportions of graduates in engineering, architecture, and other professions (Thomson, 2012). Furthermore, Mexico's geographical proximity to the United States allows shorter supply chains, lower transport costs for bulky items, and quicker delivery times in the context of increasingly popular "fast fashion," "just in time," and other "rapid response" business models. However, this turn-around is not based on the success of domestic firms. As with China, Mexico is a platform for multinational enterprises (MNEs) seeking to locate labor-intensive aspects of GVCs (including both manual and knowledge work) in a country that is both low cost and close to the huge United States market.

We believe that Brazil can follow Mexico's lead, and even do better. Brazil is connecting to GVCs at a different historical moment, and has levers to improve its position in GVCs that neither China nor Mexico possess. In many respects, the explosion of GVCs in the 2000s passed Brazil by. But GVCs are rapidly extending into Brazil today, and the country now has the opportunity to turn its late entry to its advantage. First, other countries have already filled many of the low-value-added niches in GVCs, in both goods- and services-producing industries. Lead firms are just starting to experiment with outsourcing and offshoring more technology- and knowledge-intensive business processes. This puts Brazil in an excellent position. Historically speaking, Brazil has a stronger domestic technology base than either China or Mexico. Past policies of import substituting industrialization (ISI), while unsuccessful in spurring the development of fully competitive and independent industries, has left pockets of excellence that can, with the right mix of policies, play important roles in GVCs going forward. Like Mexico, Brazil is in the same hemisphere as the United States, allowing real-time collaboration on knowledge-intensive work, and Brazil's temporal and cultural proximity to Western Europe is an advantage for the same reason. In services and knowledge-intensive aspects of GVCs, Brazil's physical distance from large markets in the North are less of a hindrance than in good-producing industries.

Like China, Brazil has a large internal market, allowing it to implement industrial policies that would be impossible for a smaller country (e.g., local content regulations and tax breaks), and it lies at the core of Mercosur. The question is, what sort of industrial policies make sense given the historical moment? Should Brazil pursue policies of the past, and seek to develop fully independent domestic industries, separate from GVCs? Should Brazil pursue the same low-value-added business functions that have driven growth in China and Mexico? Or should the country seek to capture more of the new, higher-value-added functions that are being hived off into GVCs today?

THE OPPORTUNITIES AND CHALLENGES POSED BY GVCs

As we have already implied, GVCs are creating new challenges in many arenas, including corporate strategy, government policy, the collection of economic statistics, and so on. At the most basic level GVCs create new challenges for economic development strategy. Is it wise to specialize in specific parts and sub-processes within GVCs, or do companies and countries that are fully vertically integrated perform better? In the 21st Century, is it even possible for a single nation to control and capture all aspects of an industry, especially if the industry is technologically intensive? If specialization is acceptable, does it matter what the specializations are? What are the effects of GVCs on wealth creation, employment, and innovation? What strategies and policies can help national industries engage with GVCs in ways that are productive and sustainable? What would an effective GVC-oriented industrial policy look like?

These are difficult questions, in part because the answers are highly contingent on the conditions and trends in very specific industry GVCs (e.g., GVC patterns, effects, and possibilities in apparel are different than in aerospace). But what can we say about GVCs in general? First, we know

that GVCs have become a central force driving structural change in many modern economies, and that this has triggered both positive and negative outcomes in developing and industrialized nations. On the positive side, we know that firms that trade tend to be larger, earn higher profits, spend more on R&D, and pay higher wages than firms that do not (Bernard *et al*, 2005). Empirical research has also shown that access to a range of competitively priced foreign intermediate goods has been crucial to achieving higher productivity in both industrialized countries and recent developers such as India and China (Miroudot *et al*, 2009; Goldberg *et al*, 2008).

For developing countries, the trade, investment, and knowledge flows that underpin GVCs provide mechanisms for rapid learning, innovation and industrial upgrading. GVCs can provide local firms with better access to information, open up new markets, and create opportunities for fast technological learning and skill acquisition. Because transactions and investments linked to GVCs typically come with quality control systems and prevailing global business standards that exceed those in developing countries, enterprises and individuals in developing countries can be “pushed” to acquire new competencies and skills by participating in GVCs. In the most deeply linked developing countries, these business process improvements can sometimes be felt far beyond exporting firms and sectors.

Still, GVCs are not necessarily a panacea for development. On the negative side, very rapid or “compressed” GVC-driven development can create a host of new policy challenges in the realms of economic and social development, such as health care, social policies, and education (Whittaker *et al*, 2010). In the realm of economic and technological development, GVCs can create barriers to learning and drive uneven development over time, even as they trigger rapid industrial development and upgrading, because of the geographic and organizational disjunctures that can often exist between innovation and production. There is considerable evidence that greater profits accrue to those “lead firms” in the value chain that control branding and product conception (e.g., Apple), on one hand, and to the “platform leaders” that provide core technologies and advanced components, on the other (e.g., Intel). At the same time, contract manufacturers and business process outsourcing (BPO) service providers (e.g., call centers) tend to earn slim profits and may never develop the autonomy or capabilities needed to develop and market their own branded products. Indeed, firms that provide routine assembly tasks and other simple services within GVCs earn less, pay their workers less, and are more vulnerable to business cycles, not least because they are required to support large-scale employment and fixed capital (Lüthje, 2002).

Furthermore, the most important suppliers and service providers in GVCs tend to be large MNEs in their own right (“global suppliers”), thus crowding out opportunities for local firms. Finally, if low value-added activities tend to dominate a specific country or region, then consequences for economic performance and social welfare can be profound and persistent, shaping the business systems of entire economies over extended periods. Specifically, entrenchment in narrow, routine, low-value-added activities can lock firms and national industries into unprofitable and intellectually narrow segments of the value chain. Learning might be rapid at first, but over time such limits can become acute, especially if lead firms in GVCs move on to new low cost production platforms and more promising markets (Humphrey and Schmitz, 2002).

What is the role of policy? Economic globalization is mainly an artifact of corporate strategy. Top managers and corporate board members make decisions every day about what to invest in and where to invest. Conceptually this seems simple enough, but beginning with firm strategy places us at odds with traditional statistical analysis and policy-making for one simple reason: firm activities have begun to transcend national boundaries. There is a growing mismatch between the activities of firms and the economies, policies, and politics of nation states. Domestic rules provide only one element in the fabric of global governance that large MNEs consider.

To make matters more difficult, the traditional tools of policy-making are becoming dulled by globalization and the rise of GVCs. As the discussion so far suggests, reliance on gross trade statistics alone can produce misleading results and poorly designed policies. For example, a recent OECD study examined the sources of components for a \$600 Apple smartphone (the iPhone 4) that was assembled in China. The study estimated that only \$6.54 (3.4%) of the total factory *price* of \$194.04 was actually added in China, where the product is assembled by the Taiwanese electronics contract manufacturer Foxconn. This is because \$187.50 (96.6%) of the factory *cost* came from materials and components imported to China, most notably from South Korea, the United States, and Germany. However, the export value recorded in China's gross export statistics was the full factory *price* of \$194.04, a vast overstatement of the value of Chinese exports (OECD, 2011).

A related example, this time from Brazil, can be also found in the mobile phone handset industry. Recent trade statistics show a radical drop in Brazil's exports of mobile phone handsets, and an even more radical increase in imports. This shift reflects changes in the basic architecture of mobile phone handsets, from "feature phones" to "smart phones," a change that has seen new actors (Samsung and Apple) win market share from incumbent players active in Brazil (e.g., Nokia, Motorola, NEC).

These industry, firm, and product-level dynamics should inform industrial policy, rather than only the blurry lens of macro-level trade analysis and blind faith in gross trade statistics. Put another way, trade statistics can best be put to use to in the service of detailed case studies and finely tuned, flexible, and adaptive industrial policies. While techniques for measuring GVCs more accurately are only in their infancy, analysis of international trade needs to shift from reliance on gross trade statistics to experimentation with new data sets on "trade in value added," such as the OECD's TiVA dataset or the World Input Output Database (WIOD) based at the University of Groningen.³

³ See <http://www.oecd.org/industry/ind/measuringtradeinvalue-addedanoecd-wtojointinitiative.htm> and <http://www.wiod.org>.

BRAZIL'S GVC-RELATED INDUSTRIAL POLICIES AND OVERALL INVESTMENT CLIMATE

It is certain that GVCs will become more important in Brazil in the coming years. One reason is that the barriers to the development of GVCs are falling quickly. For example:

- The business models for GVCs have matured. They are well theorized, well documented and well known.
- Markets and supply-base capabilities have also matured around the world, providing lead firms, the orchestrators of GVCs, with a larger and broader set of potential customers and business partners.
- The largest third-party service providers including finance capital, consulting, and logistics all have global reach, and routinely help other enterprises globalize.
- Trade and market liberalization, though uneven, have risen.
- Trade infrastructure has improved dramatically in many locations. Each continent and many countries now have state of the art container and airfreight port facilities.
- Finally, the technology to weave all of these pieces together has taken huge leaps forward since the advent of computerization and low cost digital communications, most centrally embodied by the Internet, but also in less general technologies such as Enterprise Resource Planning software from companies such as SAP, database management software from companies like Oracle, computer design software from companies such as AutoCAD and Mentor Graphics, and so on.

With the pieces of the economic globalization puzzle falling into place in terms of business models, tools, and practices, one might ask why global engagement in Brazil (exporting, importing, investing, sourcing) is not more pervasive than it is. For many Brazilian firms, it is mainly a lack of information and motivation. Conducting business “as usual” exerts a powerful path-dependent force, and protected markets favor local production. If doing business at home is acceptable, firms may not be interested in the risks and pressures of global engagement, both real and perceived. If customers are specific and local, if supply-chains are domestic and not tolerant of distance, or if labor markets are unique, and markets protected, internationalization can be the farthest thing from the minds of busy managers. Food service, retail, government services, personal services, specialized equipment, the production of luxury goods, and military hardware and other government purchases are all large and important economic sectors that have been resistant to globalization so far.

However, in sector after sector there have been surprises. In financial services, call center-based services, back office functions, and even legal research and corporate R&D, the largest MNEs and global brands have found ways to enter Brazil. Supermarkets, and even coffee shops, once the realm of local and at best regional companies, are becoming part of MNEs and deeply embedded in global and regional sourcing networks (Reardon *et al*, 2003; Daviron and Ponte, 2005). In many countries, economic globalization has come with increasing scale and concentration, especially in the retail sector, with “big box” stores selling globally sourced household goods, home improvement products, furniture, and food, driving smaller retailers into specialty niches or entirely out of business, especially when they are located nearby and operate in the same line of business (Haltiwanger *et al*, 2010). As a result the pressure on fully local

firms has grown in sector after sector. Some survive nicely, and some remain immune from the pressures of economic globalization, but many have seen their customers drift away to larger, more “trendy” or lower cost alternatives offered by competitors with global reach.

As a result the perception of globalization’s pervasiveness has outrun the reality, but only to a degree. There is a feeling of inevitability about the process, of the creeping dominance of global brands, increasingly delivered through big box and Internet retailers. In this environment many workers, justifiably or not, feel the pressure: on wages, on job quality, and on tenure. Job insecurity can rise with economic globalization — not only in reality but also in perception — decreasing work mobility and demands for better pay and working conditions. At the same time, GVCs clearly create a great deal of dynamism and employment. While the results are mixed, feelings of uncertainty and anxiety triggered by globalization have political expression. Policy makers react, and form policies accordingly. As a result, an era of freer trade, enforced by the WTO and the “Washington Consensus” that trade barriers inevitably harm countries that erect them, is being complicated by a new round of industrial policy and even protectionist actions.

The implications of GVCs for Brazil’s economic development policies are far reaching. How can workers, firms, and industries be provided with the best environment for engaging with the global economy? How can we be sure that enough wealth, employment, and innovative capacity are generated at home as economic globalization proceeds? How much national specialization – and by extension, interdependence with other societies – is too much? How can the activities of MNEs (both lead firms and global suppliers) be leveraged without completely eliminating opportunities for productive and profitable participation of domestic firms and small and medium enterprises (SMEs) in GVCs? These are open questions. Even if policy-makers seek few direct interventions in the areas of trade, industrial, or innovation policy, economic globalization can make the process of economic adjustment more difficult because it accelerates the pace of change.

With stakes this high, there is broad interest in finding mechanisms to ensure that GVCs not only thrive but also work to elevate, rather than depress, the welfare of societies in which they are embedded. But with multiple externalities, high complexity, and mixed outcomes, the challenge at hand is to understand the dynamic effects of rising fragmentation on economic development more fully. There is an urgent need to develop better tools for evaluating the impact of economic globalization and the role that specific categories of firms and even entire national industries play within them.

We believe that an intelligent, dynamic, adaptive, and evidence-based policy-making process is needed in Brazil. There is a long way to go. Brazil faces a distinct set of challenges and related opportunities as it continues to develop capabilities in high-value activities within a targeted range of GVCs. Chief among these challenges is the complexity and instability of the country’s industrial policy regime. Because policies change constantly, companies are having trouble projecting into the future. For example, in our recent research in Brazil, executives at electronics firms indicated that uncertainty related to rapidly shifting local production incentives (Processos Produtivos Básicos, or PPBs) and import tariff levels have been significant constraints to growth.

Such uncertainty tends to impact SMEs more significantly than large firms because small firms do not have clout with policy-makers in Brasilia.

Policy uncertainty is just one of the many elements of what has come to be known as the “Brazil cost.” The added costs associated with working in Brazil include poor infrastructure, excessive layers of bureaucracy, corruption and high interest rates, among others. According to the World Bank’s “Doing Business 2013” rankings, Brazil ranks 130th in the world in ease of doing business, behind China and Russia. It ranks 156th in terms of paying taxes. Interviews with industry executives reflect the fact that while industrial policy interventions are needed, they will be for naught unless the broader issue of “Brazil cost” is tackled as well. One public relations executive confided, “If you don’t know the tax system in Brazil, if you can’t work with government, if you have no local source of financing, then it is very hard to operate in the Brazilian market.” Thus, while Brazil’s ‘Third Way Developmentalism’ seeks to put foreign and domestic capital on the same footing, multinational firms unaccustomed to the market remain at a disadvantage.

Even if better processes were in place, Brazil’s industrial policy lacks coherent goals. While one of Plano Brasil Maior’s main priorities is enhancing productivity- and technology-intensive activity within value chains, it does little to identify and encourage growth in specific GVC niches where Brazil has a competitive advantage. Policymakers and industry need to identify specific high-value GVC niches where Brazil can be competitive and focus on these. Many of these niches may be in the service segments of specific industries, for example engineering or software development related to the petro-chemical industry, but applicable across a range of sectors.

Local content requirements are too onerous in product markets where global sourcing is the unimpeachable norm, such as magnetic resonance imaging (MRI) devices, telecom infrastructure equipment, and consumer electronics. Industrial policy instruments like the PPB cannot keep up with constantly evolving industries like aerospace, medical devices and electronics. Local content requirements must be rethought to be more flexible, allowing firms in Brazil to specialize in niche products and products well-suited for the domestic market as well as similar markets abroad.

Involvement in higher value GVC niches like systems integration, software development, design and engineering will require an aggressive effort to increase workforce capabilities. Workforce development remains an enormous issue in Brazil, especially among occupations in the high value-added segments of GVCs. There is need for a greater supply of engineers and project managers. Retention is a particularly pressing issue given the tight labor market for skilled workers.

Logistics remains a bottleneck for many Brazilian firms seeking to participate in GVCs. GVCs require well-run customs agencies and good trade infrastructure to ensure tight production schedules are met. There have been isolated efforts to improve logistics in Brazil; however, this remains one of the key contributors to the “Brazil cost.” RECOF is one of a few efforts aimed at improving customs procedures. Under the regime, exports and imports are checked and processed

within six hours and import tariffs are suspended, among other benefits. The central problem remains that the regime is limited to firms exporting over \$10 million per year, and of the 33 companies certified, only two (Embraer and Itautec) are Brazilian. Expedited and efficient customs should not be the privilege of a few foreign lead firms. Instead, expanding the program and making clear efforts to draw in smaller Brazilian firms could lead to greater GVC integration.

Brazil's export promotion policies appear to lack focus and are poorly aligned with the realities of GVCs. Positive aspects include a push for diversification and a level playing field for local firms and MNEs registered in the country. (e.g., the Plano Brasil Maior (PBM) of 2011-2014). Apex-Brasil has supported this, helping exporters in targeted industries find buyers abroad, and BNDES export finance has followed suit. Credit lines for the export of goods and services are opened for firms established under Brazilian law; ownership need not be Brazilian. While the steps required to receive export finance appear to be transparent, the strategy behind the products selected is less than clear; product groupings within "target industries" seem haphazard and incoherent. For example, tin and tin by-products are grouped with electric typewriters and antibiotics. In sum, the connection between the PBM and export finance from BNDES is not clear. Export finance operates at the product level, and covers a diverse array of goods. It is difficult to know how these goods can be mapped onto targeted nodes and niches within GVCs. More work need to be done to identify Brazil's "sweet spots" within currently evolving GVCs and to align these more precise targets to a flexible and adaptive set of industrial policies.

WHAT DOES AN EFFECTIVE GVC INDUSTRIAL POLICY LOOK LIKE?

Industrial policy does not always have to begin with policy-makers "picking" industries, but rather with attempts to improve the performance of existing industries that link domestic firms to the global economy. This involves a search for mechanisms that can target investment and improve a country's value adding position in highly mobile segments of GVCs that are *already* in the process of spreading to new locations, or may *already* be present in the jurisdiction that policy makers are responsible for. When Brazil's policy-makers try to capture more local value added in local markets that are *already* growing rapidly, they cannot be said to be picking winners.

Of course, policy-makers using local content requirements must also be concerned with slowing market growth by raising prices to levels that block consumers' access to leading-edge products. Broad economic growth can be slowed when markets for products that make the whole economy more efficient, such as smart phones and computers, are truncated. But it is possible for policies that pressure lead firms in GVCs to add more value locally to be modest and targeted enough that they do not raise prices to the point where market growth is impeded and leading edge products fail to make it into the hands of the businesses and consumers that want them.

Once the proposition that a balanced approach is possible is accepted by policy-makers, the question then becomes how to craft effective GVC-oriented industrial policies. One way to examine this question is to ask how current industrial policies differ from traditional industrial policies. A superficial analysis of the Brazil's current industrial policies cases might suggest that

the motivations and policy tools being employed by large emerging economies have many of the features of traditional ISI industrial policy: driving import substitution with local content requirements, instituting requirements for investment in local R&D, stimulating demand in key product areas, etc. However, we see three major differences:

1. Global suppliers. Instead of merely demanding that lead firms make major investments, the GVC-oriented industrial policies in Brazil today reveal an increasingly sophisticated understanding of the global-scale patterns of industrial organization that have come to the fore in GVCs since the 1990s. Lead firms are relying on global suppliers and intermediaries for an array of processes, specialized inputs, and services, and demanding that their most important suppliers have a global presence. Hence it is suppliers, not lead firms that are making many of the new investments in Brazil. Furthermore, the largest suppliers serve multiple customers, so the success of investments is not necessarily tied to the success of any single lead firm. It is no accident that Brazil sought investments from Foxconn, rather than Apple, in its desire for iPhones and iPads to be produced in the country. Finally, by serving multiple customers global suppliers can generate enough business to justify capital intensive investments that have high minimum scale requirements, such as electronics displays and complex automotive parts.
2. Global sourcing and value chain specialization. Policies that promote linkages to GVCs have very different aims from traditional industrial policies that intend to build fully blown, vertically integrated domestic industries. Policies can target specialized niches in GVCs. These can be higher-value niches suited to existing capabilities. They can also be generic capabilities that can be pooled across foreign investors. Either of these can serve both domestic or export markets. This sort of value chain specialization assumes an ongoing dependence on imported inputs and services. Reliance on global sourcing means that the entire value chain may never be captured, but it also assures ongoing involvement in leading-edge technologies, standards, and industry “best-practices.” Clearly, industries in developing countries can no longer make outmoded products because consumers with rising incomes will no longer accept them.
3. Moving to the head of GVCs. Encouraging global suppliers to establish facilities in Brazil can have long-term advantages. Local lead firms can rely on global suppliers in their midst, and on broader industry GVCs for a wide range of inputs and services, from design to production to logistics to marketing and distribution. This can lower risk and barriers to entry for local firms, provide access to capabilities and scale that far outstrip what is available domestically, and ensure that products and services are up to date, precisely because they participate in GVCs from the beginning. Up-to-date, world-class products and services also open up export markets.

SUMMING UP

GVCs initially developed in a period of falling trade barriers, the rise of the World Trade Organization (WTO), and the policy prescriptions associated with the “Washington Consensus” – i.e., governments had only to provide a strong set of “horizontal” policies (such as education, infrastructure, and macro-economic stability) and be open to trade to succeed. Of course, many observers noted that the fastest-growing emerging economies (e.g., South Korea, Taiwan, Singapore) did much more than this through a set of industrial policies that targeted key domestic industries for growth, either behind protectionist walls, through import-substituting industrialization (ISI), and/or increased market access through export promotion, known as export-oriented industrialization (EOI). The goal of these “domestic industrial policies” was to nurture a set of fully blown national industries in key sectors that could eventually compete head to head with the industrialized nations (Baldwin, 2011).

Today, despite a growing list of signatories to the WTO, industrial policy is on the upswing. WTO accession often comes with allowances for selective industrial policies (e.g., trade promotion, local content rules, taxes, tariffs, and more indirect programs that drive local production) to remain in force for specified periods. Bilateral trade agreements can supersede what has been agreed to under WTO rules, and a handful of relatively large and advanced emerging economies (such as those in the G-20) have more clout in the institutions of global governance and are using it to create greater leeway to engage in activist industrial policies.⁴

Still, the fragmentation of global industries in GVCs complicates industrial policy debates. We argue that there can be no return to the ISI and EOI policies of old. Domestic industries in both industrialized and developing countries no longer stand alone and compete mainly through arms-length trade; instead, they have become deeply intertwined through complex, overlapping global-scale business networks created through the recurrent waves of FDI and global sourcing that comprise GVCs. Because of this, today’s industrial policies have a different character, and generate different outcomes than before. Like it or not, governments must now engage in GVC-oriented industrialization when targeting key sectors for growth. Much remains to be learned about how to do this effectively.

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⁴ For example, the new Brazilian director general to the WTO has promised to appoint a Chinese vice director.

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