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Global Fragmentation of production and its effect for developing countries

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Table of Contents

ABSTRACT

This work surveys the literature on global fragmentation of production also known as global value chains (GVCs), which is nowadays acknowledged to be the dominant feature of international trade. The recent trends as long as the driving forces behind the expansion of GVCs are first discussed. Then, the measurement indicators and the databases are presented. Next, the effects of GVCs in developing countries especially on trade flows, productivity and labor market are reviewed. Finally, we supplement this review of impacts with a case study on a major African economy, Nigeria, to see whether GVCs have shaped the production structure of this oil-producing country.

Keywords : International trade, Global Value Chains, literature review, developing countries.

INTRODUCTION

"Companies no longer compete – Value Chains Compete" (Murphy, 2007, p.11)

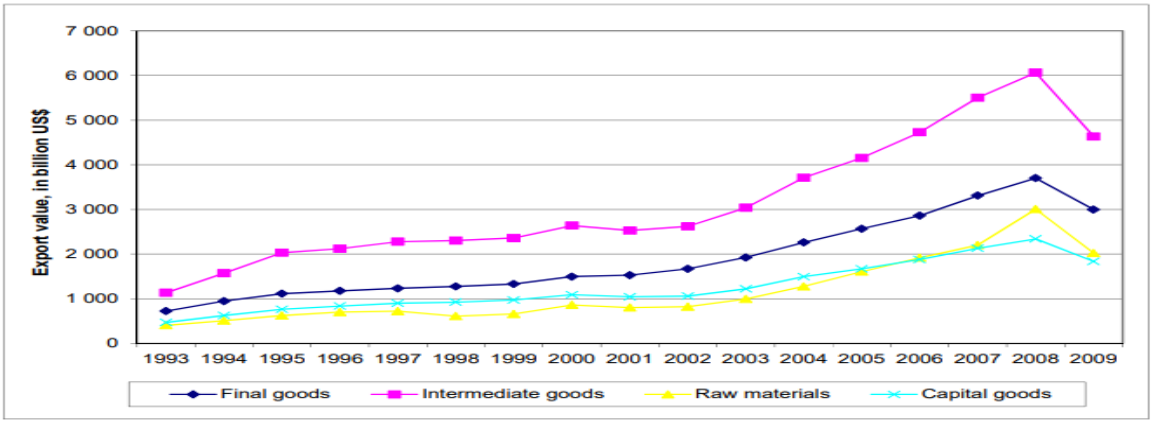
Before the 1980s, firms and sectors were the finest levels at which one could observe globalization's impact. They had an integrated production structure within countries and used domestic value chains to produce goods that they traded (Baldwin, 2006). Over the last 30 years, a new paradigm occurred based on an international network of suppliers focusing on specific phases of the production process located in different areas or countries. This second feature of world trade has variously been labelled « outsourcing », « offshoring », « internationalisation of production », « global fragmentation of production », « vertical specialisation », « slicing up of value-added chain », « disintegration of production », « multi-stage production », « intra-product specialisation », « production relocation », « global value Chain ». However, as documented in the international trade literature (Molnar, 2007, Sturgeon 2001), those concepts are quite different. For instance, outsourcing refers to the purchase of goods and services that were previously produced within the firm. It distinguishes between domestic outsourcing (when the firm providing the inputs is located in the home country) and international outsourcing when inputs come from a firm located outside the country. Offshoring combines international outsourcing and international insourcing (when foreign affiliates export back to their parent company). Intel, for example, decided in 1997 to offshore a significant part of its production of microprocessors to a $300-million manufacturing plant in Costa Rica (Antras, 2013). The internationalization of production refers to the establishment of affiliates abroad. However, most literature using the term Global Value Chain, we will use this label to describe the ongoing global economic integration.

There is not an exact definition of this concept. However, a definition adapted from the Global Value Chain Initiative at Duke University states that "A global value chain describes the full range of activities undertaken to bring a product or service from its conception to its end use and how these activities are distributed over geographic space and across international borders." (in DFAIT (2011)).

The rise of Global Value Chains (GVCs) has dramatically changed the organization of world production of goods and services, producing a deep impact on international trade and investment patterns (Amador & Cabral, 2014). This change has been fueled by three major development. The reduction of transport and communication costs, the acceleration of technological progress and the removal of political and economic barriers to trade exponentiated the opportunities for international fragmentation of production (Antras, 2015). As a result, there is a rise of systems of supply chains in which value is added at each stage before crossing a border to be passed on to the next stage. GVCs is then today one of the dominant features of global trade and investment, offering new prospects for growth, development, and jobs (WTO, 2013). Under this framework, trade, especially of intermediate goods in parts and components have dramatically increased (fig 1), with important shifts also in their composition (Timmer et al., 2014). According to WTO (2013), intermediate inputs flow account for over two-thirds of the goods and 70% of the services traded worldwide.

What are the effects of this new pattern of international trade in developing countries? The purpose of this work is to provide an overview of recent literature in international trade that has attempted to provide answers to this question.

FIGURE 1: EXPORT VALUE IN BILLION PER TYPE OF TRADED GOODS



Source: UNCTAD, 2013

The related activities of this pattern could be performed within a single firm or divided among different ones. It could also be contained within a single geographical location or spread over wider areas and be regional or truly global in nature. This idea is supported by Del Prete and Rungi (2015) who describe GVCs as a network involving a vertical fragmentation of production stages in which parts and components are produced in different countries and then assembled either sequentially along the chain or in a final location.

This fragmentation of production activities has allowed countries to better exploit their comparative advantages, often finding profitable niches of specialization (Del Prete et al, 2017). Thus, developed and developing countries are interconnected. North American and European countries are specialized in the services industry and/or research and development, while standardized production processes of manufacturing industry shift to developing countries. Hence advanced countries turned to headquarter bases and developing countries have specialized in factories (Baldwin, 2011).

Developing countries having a limited existing manufacturing or service export base and a large pool of labor, GVCs can provide them with a ‘‘golden opportunity” to become part of the international production process through participation in one or a few specific stages (IMF, 2015). Hence, producing a whole product is difficult for a developing country especially in an increasingly competitive world (Del Prete et al, 2017). As of today, some countries and firms in the developing world have been able to join a global production chain without having to provide all the capabilities, but by simply supporting the value chain as suppliers of intermediate inputs and specializing in a specific segment within, a chain, and generate a portion of the goods’ value added. (Humphrey and Schmitz, 2002). Even if this means that developing countries will then locally capture a lower share of the value added of exports. Intensive participation in GVCs exposes local firms in developing countries to the requirements of global markets and more sophisticated demand, and to learning opportunities through the transfer of knowledge and technology from multinationals to local suppliers within the global value chain framework (Amendolagine et al, 2018). This can substantially support productivity and income growth.

Alongside with the benefits and challenges of the involvement of developing countries in GVCs that we discuss in this work, we also intend to analyze GVCs participation of an oil exporting country of the developing world by exploiting the recently released Eora MultiRegional Input-Output tables (MRIO). Indeed, developing countries are known to rely especially on the export of their raw material such as oil. This case study on Nigeria will help to see whether this giant African economy has taken advantage of the new dominant feature of trade which is GVCs.

The rest of this work is organized as follows. Chapter 1 discusses the general framework of GVCs approach: the definition, the data and measurement indicators. Chapter 2 provides empirical evidence of the effects of GVCs on developing countries. Chapter 3 is about the case study and Chapter 4 discusses the challenges and benefits of developing countries participation in GVCs.

Chapter I GLOBAL VALUE CHAIN FRAMEWORK

This Chapter is about GVCs approach : how it fits with the international trade theory, its definition, drivers, measurement indicators and databases.

1.1. GVCs and International Trade Theory

Since David Ricardo's views (1817), international trade theory has been more or less based on the idea of comparative advantage. This fundamental idea states that each country which takes part in international trade will trade by specializing in producing the good in which it has a comparative advantage. Basically, a country has that comparative advantage when it can produce a good at a lower opportunity cost than another country.

Heckscher and Ohlin (HO) built on comparative advantage arguing that differences in factor endowments are what determine differences in relative costs. An implication of this theory is, for example, the result stating that labor intensive countries should specialize in producing labor-intensive products and capital-intensive countries in capital intensive products.

In those two models, it is acknowledged that difference in technology (Ricardo) and in endowment (HO) depend on locations of firms or countries. Paul Krugman (1980) with its « new trade theory » states that those differences no longer matter. Hence, even similar countries can be part of trade and gain from it. In other words, even if two countries have no discernible differences in opportunity cost at a given time, one of the country may still gain economies of scale and other network effects if it specialises in a particular industry.

GVCs fit into this evolution of trade theory. Feenstra and Hanson (1996)[1] used a Heckscher-Ohlin type model but divide the production process of final good or service into activities. They also show that these activities can be allocated to the location where they are most efficiently performed. Grossman and Rossi-Hansberg (2008) also used a similar model for trade but focus on tasks instead of activities. The activities are seen here as a set of tasks. Antras (2003, 2005) takes this question further by enhancing understanding of how leads firms choose to locate various activities and whether or not to perform the activity within the firm or to source it from outside the firm.

Whatever the "model" there is this idea of splitting/outsourcing activities of transnational corporations which then contract with suppliers located at different in the world. This productive network is fundamental to GVCs. In this sense, GVCs is not a “new new theory/model of trade ” but a new paradigm instead. This idea is supported by Globerman (2011) who suggests that GVCs, in essence, are traded at a more granular level and increase in services, but would be driven by the same factors that we have come to understand under standard trade theory.

[1] See Aaron Sydor Foreign Affairs and International Trade Canada: Impacts and implications of GVCS

1.2. Concepts and Definition

1.2.1. Value Chain

The concept was first introduced by Michael Porter (1985) in his book, "Competitive Advantage: Creating and Sustaining Superior Performance". He provided a framework which can be used to categorize productive activities into primary and support. Primary activities refer to research and development, manufacturing, marketing, logistics, and service. Support activities include finance, human resources management, technology, and procurement. The idea of the value chain concept describes the chain of dependent activities that link together to bring a product or service from conception to delivery to final consumers and after-sales services.

1.2.2. Global Value Chain

As mentioned earlier, one of the most used definition is the one of the Global Value Chain Initiative at Duke University, which states that "A global value chain describes the full range of activities undertaken to bring a product or service from its conception to its end use and how these activities are distributed over geographic space and across international borders." These products are delivered to the end consumers in international markets and the production process includes tasks such as research and development, product design, parts and components manufacturing, assembly and distribution which are carried out by firms in different countries (Gereffi and Karina, 2011, Y. Xing, 2016). Thus, depending on the type of product and geographical location of activities, the value chain will have a regional or global nature. (Cristiana Ioana, 2015).

Baldwin and Venables (2013) further describe this production process as they distinguish between different two natures of the value creation process. The "spiders" GVCS which refers to a stage fulfilled in a sequential production process and the "snakes" which is the assemblage of components from multiple sources.

Moreover, a GVC is generally governed by a firm or a small group of firms. Two types of GVCs are distinguish depending on the governance structure or the identity of the managers and leaders of a value chain : a producer-driven or buyer-driven GVC (Xing, 2016). Producer-driven GVC are developed and led by technology leaders in capital intensive industries (automobile, aircraft, computer, semiconductor, etc). For instance, the Toyota GVC in automobile industry and the Apple GVC (iPhone and iPad) in electronics sectors are producer-driven GVC. The other type of GVC, Buyer-driven GVCs, is led by large brand marketers such as H&M and Walmart (Gereffi, 1999; Xing, 2016).

The production of a well-known product like i-phone which involve the participation of some developing countries like China can really give an idea of the production process within a global value chain. Although i-phone is an Apple product, the only activities carried out there in the production process are the product design (the standards of the product) and the software. All

the other components are produced outside the US. About nine companies are part of the production process (Toshiba, Samsung, Infineon, Broadcom, Numunyx, Murata, Dialog Semiconductor and Cirrus Logic) and they are located in China, Korea, Japan, and Germany. Those parts and components are then assembled by Foxconn, a Taiwan-based company (China) and shipped to the US for quality control and distribution.

1.2.3. Upgrading in Global Value Chain

According to Gereffi et al. (2005), upgrading is the process by which nations or firms move from low-value to relatively high-value activities in the global value chain. Lall et al (2005) support this view and argue that the knowledge needed to export technology-intensive products is greater than for simpler products. Meyer-Stamer (2003), has brought a contribution about directions: upgrading means doing things differently into horizontal or vertical directions. Thus, upgrading refers to the production of higher value-added goods and services, with more efficient production strategies of firms (Md Dahlan, 2015).

Humphrey and Schmitz (2002) have identified four different forms of upgrading process (Table 1).

TABLEAU 1: DIFFERENT FORMS OF UPGRADING

UPGRADING FORMS	**Process upgrading/Product upgrading**	**Functional upgrading**	**Inter-sectoral upgrading**	**Channel upgrading**
MEANING	Introduction of more efficient production methods and better technology. It involves moving into more sophisticated and higher-value-added products.	Process during which firms acquire new functions and abandon old functions generating low incomes in the value chain.	Takes place when a firm uses its acquired production knowledge to move horizontally into new sectors.	Refers to firms entering new higher value-added and markets in the global value chain in order to lower their risk and increase sales volumes through diversification and receive higher prices for their products.

Source : Humphrey and Schmitz (2002)

1.3. Drivers of GVCs

As well as describe by Hillberry (2011), three main factors have contributed to the rapid expansion of GVCs in recent decades : technological progress and trade cost reduction, trade liberalization.

1.3.1. Technological progress and trade cost reduction

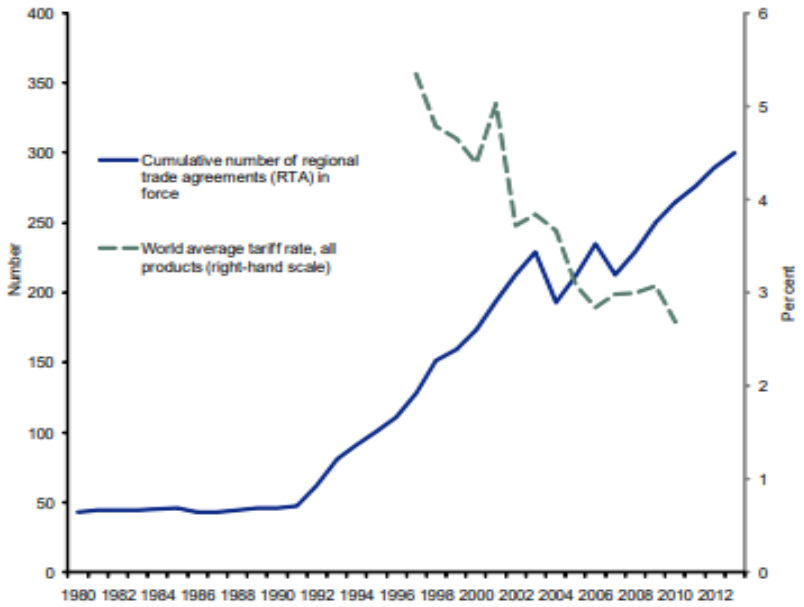
Technological progress is one key driver of the development of GVCs as the geographical distance is no longer a barrier for international service transactions (Amador & Cabral, 2014). It helps to combined parts and components produced in different location in one final product which is then sold globally. The technological progress in ICT (information, telecommunications, and technology) associated with the reduction in transportation technologies also help to coordinate and manage the activities carried out by suppliers and producers located in different areas of highly complex GVCs.

Indeed, more efficient telecommunications and information technology allows firms to "better track and schedule their shipments of goods" (Hillberry, 2011). This led countries or regions with strategic geographical location and adequate infrastructures to be core distribution and logistics hubs of GVCs, further lower the cost of doing business and increased the competitiveness of their firms (Amador & Cabral, 2014). Studying the role of Hong Kong in the distribution of China's exports Feenstra (2004) highlights how China became a hub in GVC due to these transport considerations.

1.3.2. Trade liberalization

As described in figure 2, the reduction in tariffs rate facilitated the signing of a trade agreement between economic partners. Indeed, according to Orefice and Rocha (2013), signing deeper agreements goes in hand with production networks and this network eases trade among partner of the same supply chain. Authors also claim that countries part of GVCs are more willing to sign deeper preferential trade agreements to develop commercials relations.

FIGURE 2: TRADE AND TARIFFS



Source: World Development Indicators (WDI), Amador and Cabral, 2014

Many agreements have then been signed in this regards. The Association of Southeast Asian Nations (ASEAN) Free Trade Area (AFTA) was signed in 1992 between ten countries in Southeast Asia (Indonesia, Malaysia, the Philippines, Singapore, Thailand, Brunei, Myanmar, Cambodia, Laos, and Vietnam). This AFTA agreement aims at creating a single market with China playing a key role in this process. This AFTA agreement has certainly contributed to the development of a regional GVC in Asia.

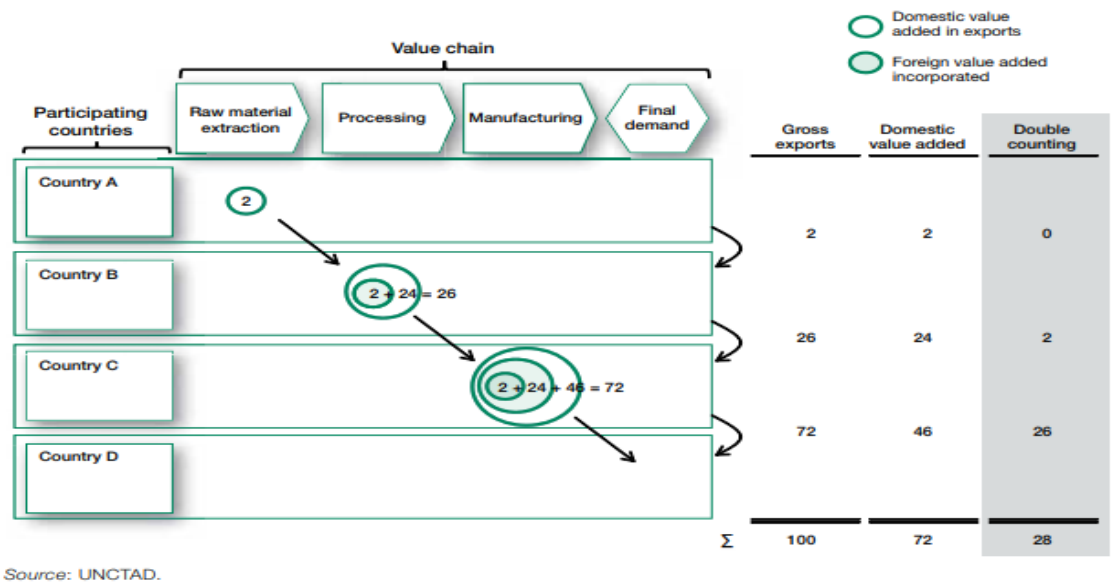
Another important free trade agreement is the regional trade agreements named the North American Free Trade Agreement (NAFTA) between the United States, Canada, and Mexico which was signed in 1994. As it is supported by Amador & Cabral (2014), the NAFTA agreement led to a substantial increase in cross-border trade and FDI flows as well as a deepening of production-sharing in North-America which are the features of the regional value chain. Many other trade agreements and economic agreement such as economics areas (such as Eurozone) can also explain the trade under GVC.

1.4. Dataset of GVCs

In order to yield meaningful estimates of production fragmentation, it is important to separate the data on parts and components (that are proxy for production fragmentation) out from the reported gross trade statistics. (Srivastava and Rahul Sen, 2015). According to Athukorala and Yamashita (2005), there are primarily two reasons for such segregation : (i) production fragmentation may lead to double-counting of trade data when the same parts and component used as an input for the final good crosses multiple international borders during production stages ; and (ii) the calculated trade share can provide incorrect inferences as to the relative importance of a "region" vis-à-vis the rest of the world. (figure 3).

Given that, recent advances in trade statistics have been developed with the aim to identify the double counting in gross trade and compute the real global production as highlight in figure

FIGURE 3: VALUE ADDED TRADE IN A DEVELOPING WORLD



Source: UNCTAD.

Three main methodological approaches have been used to measure GVCs. (1) international trade statistics on parts and components ; (2) international trade data combined with input-output (I-O) tables and firm-level data.

1.3.1. International trade statistics on parts and components

This type of approach was introduced by Ng and Yeats (1999). It consists of the use of international trade statistics to measure global fragmentation by comparing parts and components in goods with trade in final goods. The main advantage of this approach is the fact that trade in parts and components has been more dynamic than the trade in final goods until the mid-2000s (Jones et al. , 2005). This method has high coverage and a low complexity of the data, and also ease the comparability of data across countries. However, the low accuracy of this measure and its dependence on product classification of trade statistics (parts and components aggregate is obtained from the Standard International Trade Classification (SITC)) have justified the development of other measures.

1.3.2. Firm-level data

Some research in GVCs uses firm-level data. With this approach, qualitative survey is made on firms to collect trade data to quantify the importance and analyze the structure of global fragmentation. These surveys are made one time and do not usually capture the dynamics of-of the offshoring task carried out by the firms.

Despite this limitation, some researchers still use firm-level data to validate the theories related to firms behavior in a GVC context. For instance, Antràs (2013) review the empirical works which used such dataset to test the prediction of the property-rights theory for the international organization of production and the structure of international trade flows.

1.3.3. Input-output based measures

As global fragmentation spread, integration in a GVCS and the role of trade in intermediate goods should be taken into account in the analysis of the global export potential and competitiveness. Therefore, trade in value-added data needs to complement the analysis of gross trade flows which are decomposed in domestic and foreign value-added (Amador & Cabral, 2014).

This call for the need for new data in order to disentangle the contribution of global trade to each nation's value-added as well as output like GDP and employment. Hence, world I-O (input-output) matrices have been produced with data on trade on intermediate goods between countries. Many databases has then been produced to this aim. The main I-O projects are summarized in figure 4.

Among all those databases, the most used for studies in GVCs are the OECD-WTO and the UNCTAD-Eora GVCS database. The OECD-WTO database is named TiVA (Trade in Value Added). The TiVA database has been released in 2013 for this purpose and has been mostly used in policy-oriented studies afterward. This database includes data in value-added for OECD countries and South Africa.

The other most major database with regards to the number of studies using it is the UNCTAD-Eora GVCS database. This database is the collaborative effort between the United Nations Conference on Trade and Development (UNCTAD) and the Eora project produced the multi-regional I-O (MRIO) time series dataset on value-added in trade. This database includes much more countries, developed as well as developing ones. This database combines a variety of primary data sources, including national I-O tables as well as main indicators from national statistical offices, and aggregates them into a balanced global MRIO. It uses interpolation and estimation methods in order to provide a contiguous, continuous dataset for 187 countries including 49 African (Del Priete, 2017).

FIGURE 4: THE MAIN GLOBAL INPUT-OUTPUT DATABASES USED IN GVCS ANALYSIS

	Geographical coverage	Sector breakdown	Time span	Methodological reference
GTAP (Global Trade Analysis Project)	129 countries	57 sectors	1997, 2001, 2004, 2007	Aguiar and Walmsley (2012)
WIOD (World Input-Output Database)	40 countries	35 sectors	1995-2009	Dietzenbacher et al. (2013)
OECD-WTO TiVA (Trade in Value Added)	57 countries	18 sectors	1995, 2000, 2005, 2008, 2009	OECD and WTO (2012)
UNCTAD-Eora GVC Database	187 countries	25 to 500 sectors	1990-2010	UNCTAD (2013*a*)
IDE-JETRO (Institute of Developing Economies - Japan External Trade Organisation)	10 countries	76 industries	1975, 1980, 1985, 1990, 1995, 2000	Meng et al. (2013)

Source: Amador and Cabral, 2014

1.5. Indicators

GVC's "participation" of a country is based on the Koopman et al. (2014) decomposition. Under this approach, the domestic and foreign value-added components of gross exports are computed separately. The foreign value-added share (FVA) is an indicator which identifies the share of a country's exports that corresponds to inputs produced in other countries. It captures the participation of downstream firms involved in the global production network. Hence, the corresponding share of exports is not taken into account when computing the GDP of the

country of interest. The other indicator is the indirect value added (DVX). It is the part of domestic value added to the country of interest used as intermediate inputs in other countries' exports. Thus, DVX refers to the contribution of the economy of the country to the exports of other countries. It is then a measure of GVC participation for upstream sectors.

Finally, GVC participation of a country is computed with the following formula :

GVC participation Index = (FVA + DVX) /Gross exports

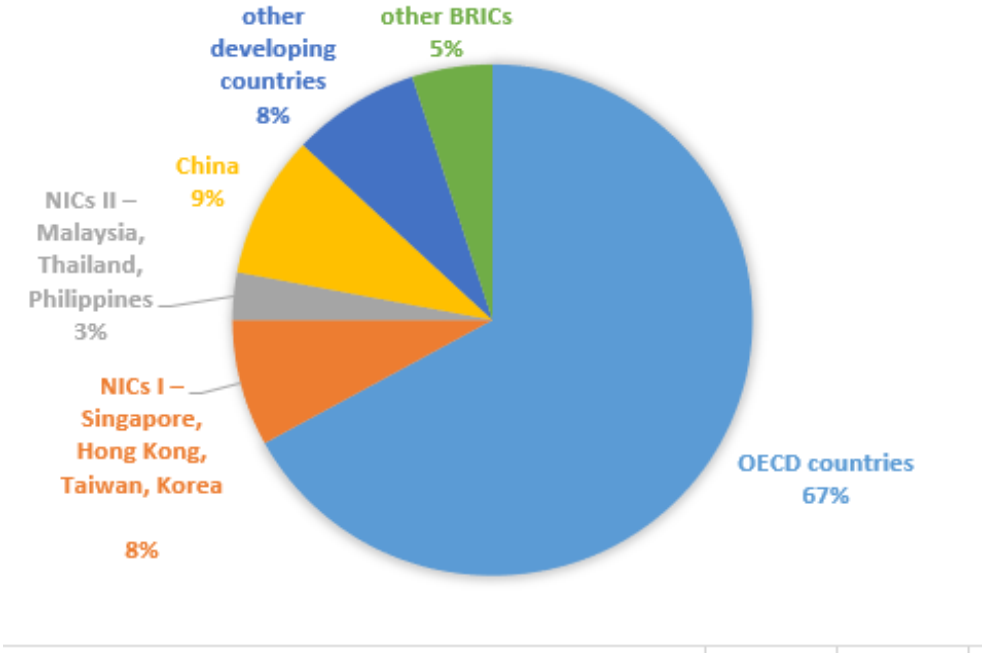
Chapter II GVCs : EMPIRICAL EVIDENCE FOR DEVELOPING COUNTRIES

GVCs stand as the dominant paradigm in world production today and its effects span over multiple dimensions. In this chapter, we review the empirical research on the effects of GVCs on developing countries, organized around three main elements : trade flows, productivity and employment, and wages.

2.1. Effects of GVCs on trade flows

With the rise of GVCs international organizations and scholars have made great efforts to explore new metrics to avoid double counting in trade flows. Those initiatives led to the introduction of trade in value added. As shown on figure 5, all types of economies, developed or developing, participate in Global Value Chains. They are all importers and exporters of intermediates goods. However, this participation is heterogeneous and the distribution of gains uneven across economies, with 67% of total global value added created under GVCs accruing to OECD economies.

FIGURE 5: SHARE OF GVCS PARTICIPATION



Source: adapted from Banga R, UNCTAD 2013 'Measuring Value in Global Value Chains'

But the rate of GVCs participation is higher for developing countries compared to developed countries (table 1). This show that developing countries are catching up with a growth of participation (6.1%) above the global rate (4.5%) even if this is mainly due to China.

TABLE 1:GROWTH RATE OF GVCS PARTICIPATION

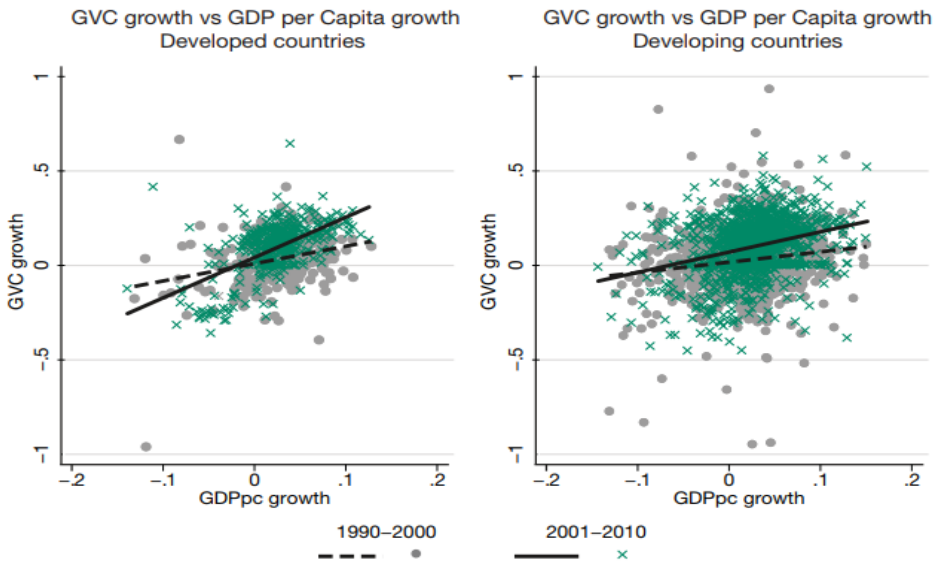
	Growth of GVCS participation (2005-2010)
Global	4.5%
Developed economies	3.7%
Developing economies	6.1%

Source: adapted from Banga R, UNCTAD 2013 'World investment report'

Whatever the level of development and participation, all the participating countries seem to benefit from GVCs.

Indeed, there is a strong correlation between GVCs growth and the GDP per capita growth especially for the most recent decade (2001-2010) as shown in figure 6. Being part of the Global value chain seems to be good for economic growth. This might happen because domestic of countries involve in GVC will learn from the lead firm and become more productive.

FIGURE 6: GDP GROWTH AND GVCS PARTICIPATION



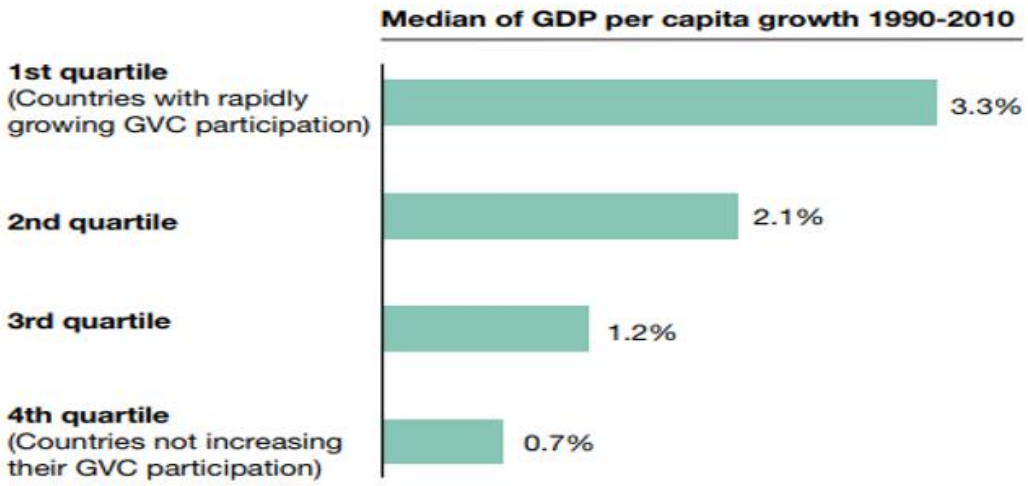
Source: UNCTAD-Eora GVC Database, UNCTAD analysis.

This does not imply causality but compared to non-participating countries, developing countries which are part of the Global Value Chains have better results in terms of economic growth improvement.

Figure 7 ranks all the developing countries in 4 categories according to their level of participation (GVCS index).

The results show that the top 25% of participating countries had an average GDP of 3.3% during the last two decade while the bottom 25% only increased their GDP growth by 0.7%.

FIGURE 7: AVERAGE GDP BY THE LEVEL OF GVCS PARTICIPATION IN DEVELOPING COUNTRIES

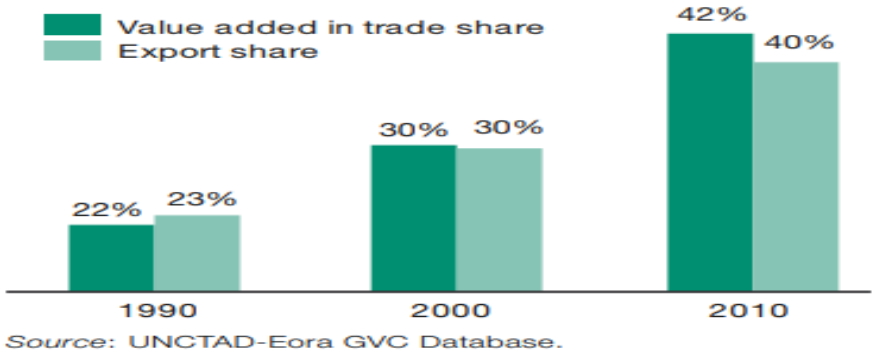


Source: adapted from Banga R, UNCTAD 2013 'World investment report'

Moreover, the developing countries who participated the most in Global value chain have been able to increase their world export share by 40% and their value added in trade share by 42% during the period 1990-2010 (fig 8). Exports being a component of the aggregate demand and a driver of GDP growth in developing countries (even if the base of some of them is limited to commodities goods).

Thus, this result is in line with the previous one above (fig 7) as export is a component of aggregate demand thus an increase in export share contributes to higher GDP growth for the developing participating countries.

FIGURE 8: EXPORT SHARE AND VALUE ADDED IN TRADE SHARE OF GVCS PARTICIPATING COUNTRIES

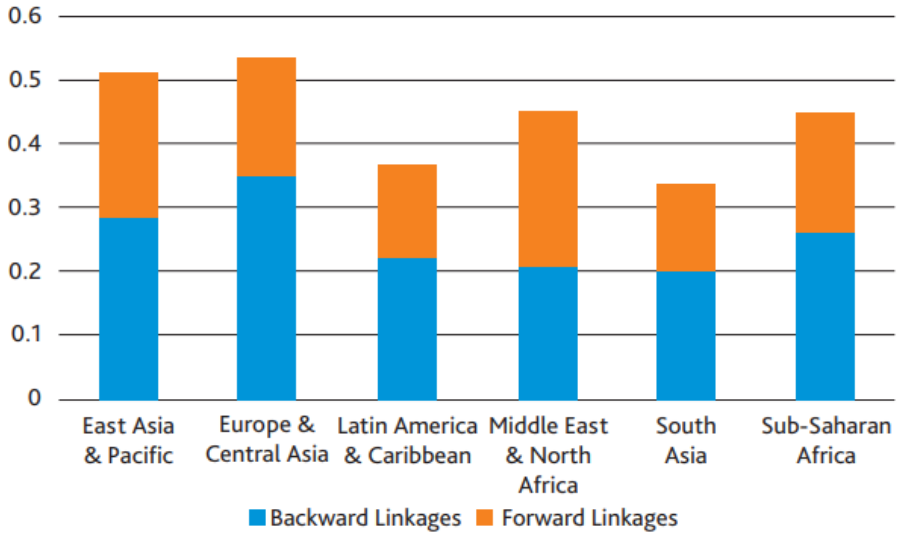


Source: adapted from Banga R, UNCTAD 2013 'World investment report'

This benefit of GVCs participation is clearly uneven both across developing regions and across countries.

According to their GVCS index (fig 9), Asian countries capture the highest share of Global value chain in developing countries. Even if this result is only at an aggregate level and could be different at the sectoral level.

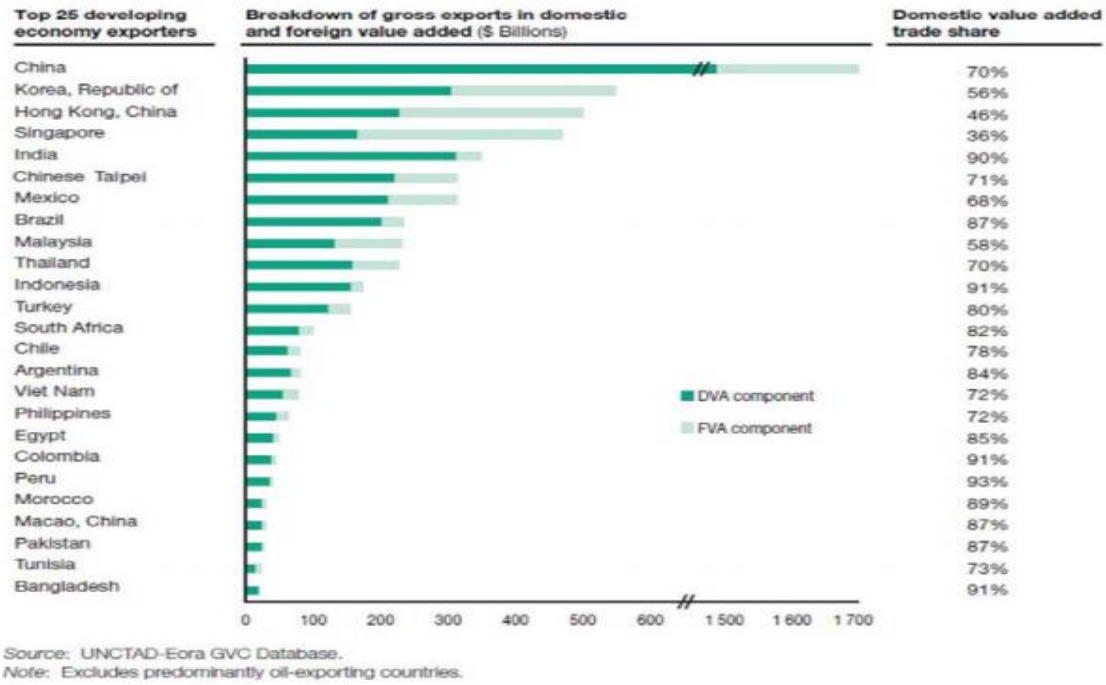
FIGURE 9: GVCS PARTICIPATION INDICES BY DEVELOPING THE REGION



Source: International Center for Trade and Sustainable Development, 2016

At the country level, according to the UNCTAD report (2013), there are significant differences in the degree of participation even among the top 25 developing economies (fig 10). East and South-East Asian led by China have the highest level of participation in GVCS. Their exports in value-added are made of a substantial part of foreign imports (backward linkages) and are used as intermediate goods in the exports of foreign economies (forward linkages).

FIGURE 10: TOP 25 DEVELOPING COUNTRIES GVCS PARTICIPATION



Taguchi and Ni Lar (2015) showed that Asian developing economies GVCs participation in manufacturing sectors have allowed domestic value-added contributions to their exports to GDP from 57% to 71%. According to the researchers, this result is mainly due to the building of infrastructure and the formation of **regional value chain** especially in manufacturing sectors with China and Japan serving as an anchor for integration into global value chains.

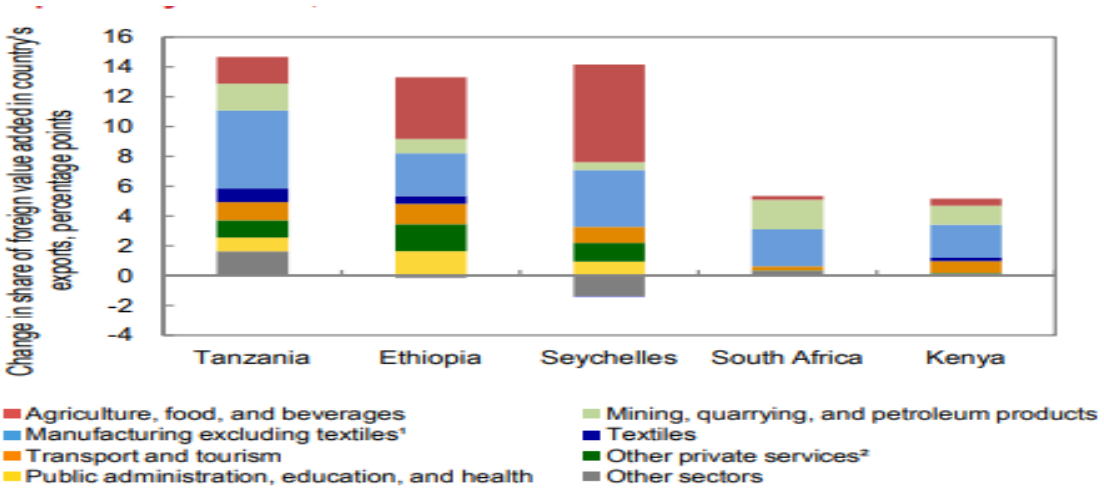
For the case of Sub Saharan Africa, countries still generally find themselves at the very beginning of global value chains as a higher share of its exports enter as inputs for other countries' exports, reflecting the still-predominant role of commodities in many countries' exports in the region (IMF, 2015). A reduction in tariff rates across the region toward the world average could increase the share of foreign value added in exports by about 3%.

However, five countries in the region stand out in GVCS involvement. Their share of foreign value added in their exports has increased by at least 5% in the last two decades (IMF, 2015).

Figure 11 depicts those countries: Ethiopia, Kenya, Seychelles, South Africa, and Tanzania. For Ethiopia and Seychelles, sectors like agriculture and agro-business benefited the most from the integration of countries in the Global Value Chain. Manufacturing and mining for Tanzania, Kenya, and South Africa but also to a lesser extent textile, transport, and tourism in Tanzania.

According to the IMF study, these results are of a similar magnitude to that experienced by countries such as Poland or Vietnam that are considered as success stories in global value chains. Moreover, this study also highlights the sector in which sub-Saharan Africa has potential comparative advantages namely: agro-business, light manufacturing, tourism, and textiles in which the region also has a young and growing labor force, a large share of unused land and an appropriate climate.

FIGURE 11: CONTRIBUTIONS TO CHANGE IN SHARE OF FOREIGN VALUE ADDED IN EXPORTS BY SECTOR, 1991–95 TO 2008–12

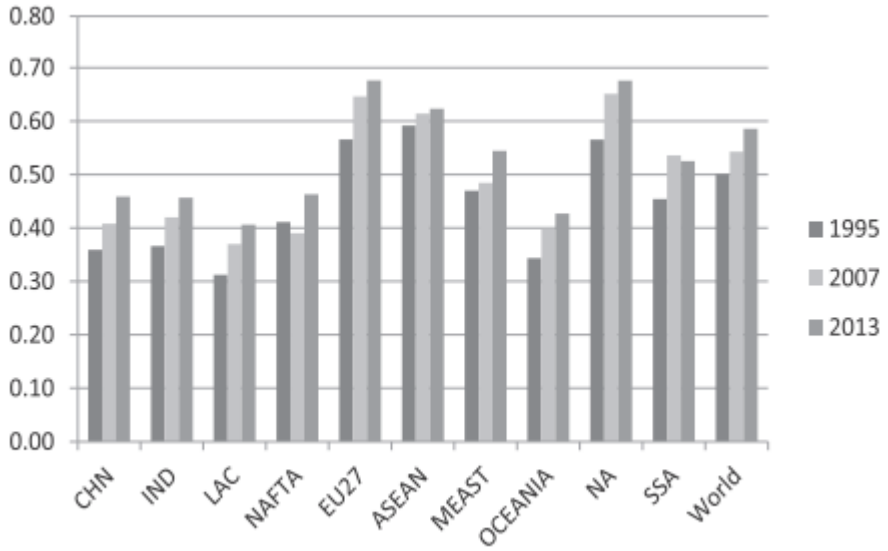


Source: IMF, African Economic outlook, 2015

For the Noth African (NA) region, a study of Del Prete et al (2017) exploiting the Eora multiregional Input-Output tables provided an assessment of the participation and the position of North African countries in global value chains (GVCs). They found that North African countries have not so far been able to fully enter into GVCs. Indeed, participation in GVCs of

NA countries has been steadily increasing (fig 12) even matching the level found in other major areas like the EU at 68% in 2013.

FIGURE 12: EXPORTS UNDER GVCS FOR THE SELECTED AREA



Source: Del Prete et al (2017)

However, this result hides the fact that NA takes part in GVCs by contributing mainly to the upstream phases, hence they are confined to low value-added stages of production. But thanks to some policy measures aiming at reducing import duties, especially Morocco and Tunisia could potentially increase the GVCS participation benefit by 15% or more with free trade policies (Kowalski et al. (2015)).

Del Prete et al (2017) measured GVCS participation by the extent to which NA's exports are integrated into the international production networks by either using foreign value-added in their own exports or value-added supplied to other countries' exports. According to this study, local conditions to retain the benefits remain :

- Lower trade barriers Tariffs are therefore more likely to add a significant cost to the price of the finished good
- Favorable environment for foreign investments: tax-free raw materials imports and investment subsidies

2.2. Effects of GVCs on Employment and wages

There is little empirical work on the employment effects of GVCs in developing countries. However, all the studies on the subject are broken out by skill level. Slaughter (2002) studying the behavior of US multinationals outsourcing their activities abroad outlines three mechanisms that can influence the demand for skilled labor in the host economy : technology transfer ; investments in new technologies ; and technology flows to host country firms. He finds strong

empirical evidence in favor of the first two channels in some developing countries and more mixed result in the case of the third mechanism. This suggest that the outsourcing activities of firms from advanved countries can translate not only into jobs creation but also to employment of more educated workers in developing economies.

Fajnzylber and Fernandes (2004) find similar nuance between differences in employee skill levels in Brazil and China. The outsourcing of multinational activities is associated with an increased demand for skilled labor in Brazil, while it is not the same in the case of China. This difference is likely due to the importance of simple assembly operations in China (Ben Shepherd, 2013).

Another important feature of GVCs is services. Services GVCs are growing in scale and scope with the rise of offshoring in developing countries such as India and the Philippines. Some studies have then focus on GVCs services. Fernandez-Stark et al. (2010) provide evidence of the labor market issues in a case study of the offshore services GVCs in Chile. Chile's offshore services industry export at least USD 1 billion annually, and employs over 20 000 workers. According to the case study of Fernandez-Stark et al. (2010), Chilean tertiary workers are highly skilled unlike other countries like India. They also found that the total offshore exports services consist of information technology outsourcing, business process outsourcing (BPO), and at a slower rate, knowledge process outsourcing. About 41% of workers are found in BPO activities including customer service, marketing, and sales. The Chilean offshore services sector also have a relatively stronger demand for skilled labor compare to other sectors. This is also the result of a strong supportive policy of the Government aiming at enhancing the capacity of workers.

Lüthje (2004), also studied the labor market issues in China. He found that manufacturers in China typically use equipment sourced from overseas. In terms of the demand for skilled and unskilled labor, the evidence showed by Lüthje (2004) confirms some of the econometric evidence found for China (see Ben Shepherd, 2013). Typically, a large proportion (70%-80%) of low-skilled workers engaged in simple assembly operations. Regarding the labor demand, Lüthje (2004) found a high turnover of employees of about 20% or even 30%- 40% per annum. This feature shows that GVCs have generated a highly flexible labor market in China.

Studying the implications of GVCs for employment in India, Karishma Banga (2017), especially examined the industry-level impact of participation in Global Value Chains on employment growth in India over the period 1995-2011. Using methodologies of fixed effects and generalized method of moments, the author analyzes how increasing Foreign Value Added in output, Foreign Value Added in exports (backward linkages), and Domestic Value Added in exports of intermediate goods (forward linkages) can affect Indian employment growth. She found that higher backward linkages have negatively influenced employment growth in the non-manufacturing industries of India in particular. However, considering all the sectors, higher forward linkages did not have any statistically significant impact on employment. Thus she concludes that the net effect of Global Value Chains participation on employment growth in Indian industries has been negative over 1995-2011.

These studies highlights the fact that apart from some countries (such as Chile), the effect of GVCs in developing countries seems to be negative and workers are confined at low level tasks.

2.3. Effects of GVCs on productivity and innovation of local firms

The global fragmentation of production has created new opportunities also for developing economies and for small and medium-sized firms. Existing evidence from different countries shows that entering a GVCs can result in increased productivity (Antras and Yeaple, 2015). An increase in GVCs participation leads to higher domestic value added and productivity. This is the case especially for forward linkages for which a 1% increase in GVCs participation leads to 0.60% higher domestic value-added and to 0.33% higher labor productivity. (Kummritz, 2016).

The main channels through which GVCs participation increases the value-added and productivity of its participants (Baldwin and Robert-Nicoud, 2014) appear to be (i) learning-by-doing, (ii) technology transfer or/and FDI spillovers, and (iii) gains from specialization as well as terms of trade effects.

Regarding learning by doing, lead firms of GVCs strengthen the capability of suppliers to meet the requirements of the buyers and help them upgrade (Pietrobelli, 2008). Artola & Parrilli (2007) show how a large multinational firm, Parmalat, mainly targeting the national and the Central US markets helped Nicaraguan local producers to improve higher milk quality standards, and to develop a new 'culture' of milk consumption. In fresh vegetables, Kenya consolidated and improved quality inssurance and diversifying into snow/snap peas and cut flowers that they export to UK (Gibbon and Ponte, 2005). Indeed, as well put by Bilgin Orhan (2013) GVCs involvement requires sufficient investment in skills and sophisticated technological progress to translate into productivity growth and help countries compete in an increasingly knowledge-based global economy.

In the same vein, Amendolagine et al (2018) contributed to improve the understanding of the link between GVCs participation and productivity. They matched two firm-level data sets on 19 Sub-Saharan African countries and Vietnam to country-sector level measures of GVCs involvement in order to investigate whether and how participation in GVCs of host countries is associated to local sourcing by foreign investors. They found that more intense GVCs participation and upstream specialization are associated with a higher share of intermediate products sourced locally by foreign investors. Intensive participation in GVCs exposing local firms to the requirements of international markets and more sophisticated demand, this local sourcing of inputs will, in turn, enhance their productivity.

However, this view is contrasted by Rabellotti (2015). Indeed, she claims that the effect of GVCs participation on productivity and innovation is not automatic as domestic technological capabilities at the firm, industrial cluster/regional and local innovation system-levels also matter. Moreover, these effects are larger in countries with stronger rule of law and better education.

Regarding the channel of FDI, it is argued that firms in developing countries that have accepted foreign investment tend to be more productive than domestically-owned firms (Ben Shepherd, 2013). In the same vein, Shepherd and Stone (2011) find that foreign firms are more productive than domestically ones using a panel of data from 115 mostly developing and transition economies (they distinguish between OECD countries and non-OECD countries), they show

that the productivity-enhancing effect of inward FDI of the type of GVCs is more likely to be positive in developing countries.

In addition, there is evidence of positive spillover effects of FDI for domestic firms: Javorcik (2004) finds strong evidence for spillovers for Lithuania. However, Hale and Long (2011b) find little evidence of positive spillovers using Chinese firm-level data. The difference between the two results perhaps suggests that the type of foreign investment that is dominant in a particular country-sector might determine the extent of productivity spillovers that take place (Ben Shepherd, 2013).

These results suggest that inward FDI that takes place within the context of the development of GVCs have a positive impact on labor demand as it induced domestic fims growth. Karlsson et al. (2009) found similar results for the Chinese labor market. They find that foreign-owned firms tend to experience relatively high employment growth than domestic owned firms. However, this FDI of type of GVCS appears to have positive employment spillovers as domestically owned firms also experience faster employment growth as a result of foreign investment in firms in the same sector.

Chapter III EFFECT OF GVCs ON OIL PRODUCER COUNTRIES: CASE STUDY NIGERIA

Given the changes in the trade network that have taken place in the last twenty years, the frame of mind should be: "think value chain". Hoekman (2014)

The Nigerian economy still faces the challenge of limited economic transformation and diversification which is materialized by a specialization in low value-added domestic activities. Even the change in accounting of GDP concluded for the period 1990-2010 has not shown either sign of diversification nor less reliance on the natural resource. Indeed, the effort made by the Government to turn the productive structure of Nigeria into an industrial economy has not yet materialised despite a GDP growth of average 5% in last years which led Nigeria to be one of the two most important economies in Africa.

Value chain integrated into the global system could be an answer for the industrialization of the country due to is numerous advantages. Indeed, GVC helps to bring together producers, processors, buyers, and sellers in order to add value to goods and services. It provides a framework where a country can just focus on a given segment of the manufacturing process without having to build all the industry. GVCs has also proven to contribute to higher national economic growth since the mid-1990s through higher productivity gains it allows. Besides, it has high positive effects on technology transfer and skills upgrade which can translate to job creation, for activities directly connected to the chain and also indirect jobs.

This Chapter reviews the state of GVCs in Nigeria which is an oil exporting country, member of the Organization of the Petroleum Exporting Countries (OPEC). The objective is to look at the extent to which the country is involved in GVCs.

1. Nigeria Involvment in Global Value Chain (GVC)

The involvement in GVCs is assessed through the GVC index which combined the forward linkages and the backward linkages of the country. The latter highlight the extent to which a country uses imports inputs to produce its exports products and the forward linkages show the importance of country exports in the productive structure of other countries. As discussed in section 1.5, the GVC index is the sum of the domestic (DVX or forwards linkages) and foreign value-added (FVA or backward linkages) components of gross exports.

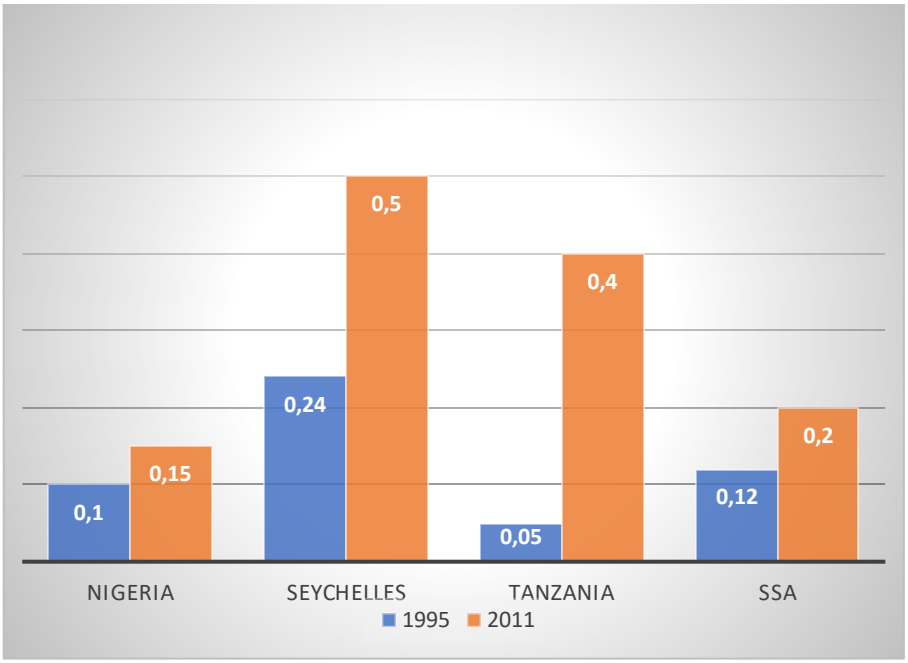
The estimation of these indicators based on EORA-Data (describe in section 1.3.3) shows that Nigeria is yet upcoming in GVCs as the country ranges among the lowest on the continent both on backward and forward GVCs integration. We estimate this GVCs participation in Nigeria and compared them to the deepening of the integration in selected countries.

Results on the estimation on total GVCs participation show that in 2011 while Seychelles, Tanzania recorded a total GVCs participation rate of 0.74, 0.67, respectively, Nigeria scored 0.45. Thus the share of Nigerian exports embodied in GVC is about 45% which is too low compared to the average in EU27, 68%. Even if EU27 take part in GVCs by contributing mainly to more sophisticate stages of production compared to African countries like Seychelles and

Tanzania. It is then useful to look at participation at a desagragate level of participation : backward and forward integration.

For the backward integration (fig 13) Nigeria demonstrates less strength compared to African countries like Seychelles, and Tanzania which are among the top 30 countries in the developing world. Indeed, Nigeria recorded a backward GVCs participation of 0.15 in 2011 less than peers countries and even less than the average of Sub Saharan Africa (0.2). This implies that Nigeria uses less imported inputs in its overall exports compared to peers countries. Thus Nigeria does not import much goods and services for its productive structure, instead, Nigeria uses foreign goods directly for consumption.

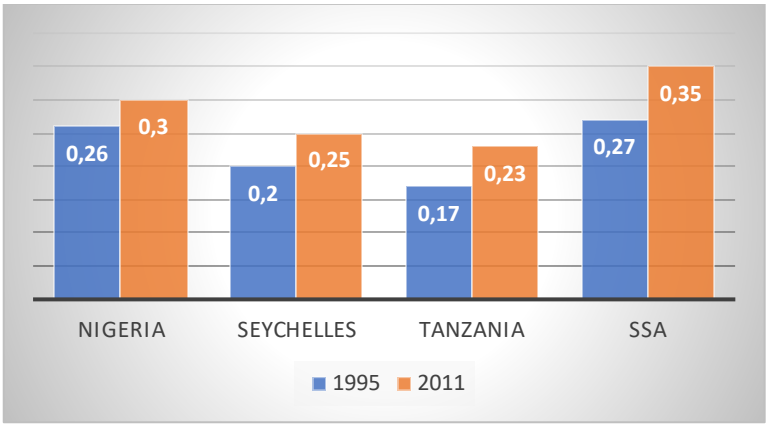
FIGURE 13: BACKWARD INTEGRATION NIGERIA AND SELECTED AFRICAN COUNTRIES



Source: Author with data from EORA-Data base

The figure 14 now depicts the forward linkages GVCs participation of Nigeria and selected peers countries using data from the UNCTAD-EORA GVCs database. Results of 2011 shows that while Seychelles, Tanzania recorded a forward GVCs participation rate of 0.25, 0.23 respectively, Nigeria scored 0.3. This implies that peers countries demonstrated more strength in backward integration compared to forward. Thus, they use more imported inputs to produce their exports while Nigeria's strength is in forward integration, suggesting that the country's exports are dominated by raw inputs that are used in third countries' exports.

FIGURE 14: FORWARD INTEGRATION OF SELECTED SSA COUNTRIES INTO GLOBAL VALUE CHAINS, 1995 AND 2011



Source: Author with data from EORA-Data base

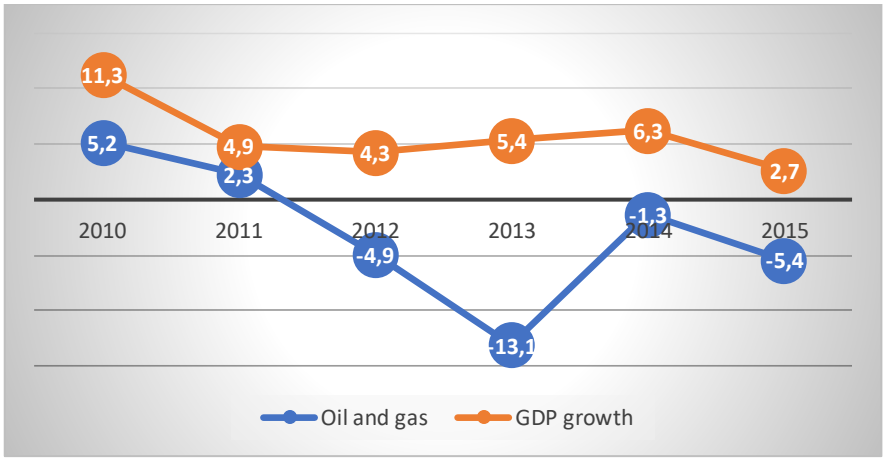
Indeed, Nigeria is highly endowed with basic inputs and commodities and heavily rely on them for the GVCs participation in contrast with developing Asian and American countries that are active in GVCs and relatively highly advanced and sophisticated with a very strong backward and forward GVCs participation rates in clothing and apparel, manufacturing, electronics, services, etc. They recorded, for example, a total annual average GVCs participation rate of around 70 percent in 2009.

Nigeria involvement in GVCs is more based on the natural resource as the country is especially rich in several agricultural products (cocoa, groundnut, palm produce, cotton, tomatoes, cassava, rice, maize, etc.) and crude oil and natural gas.

As shown in the following figure 15 its economy is driven by oil and gas. The recent decrease in the price of oil and gas led to a slow down of the GDP growth suggesting that diversification of trade away from natural resources has stagnated, if not gone backward, over the last 20 years in these countries. (IMF 2015).

Oil exporters seem to be the least integrated into global value chains in terms of the foreign value-added content of their exports.

FIGURE 15: RECENT TRENDS IN GDP GROWTH AND OIL SECTOR GROWTH (2010-2015)



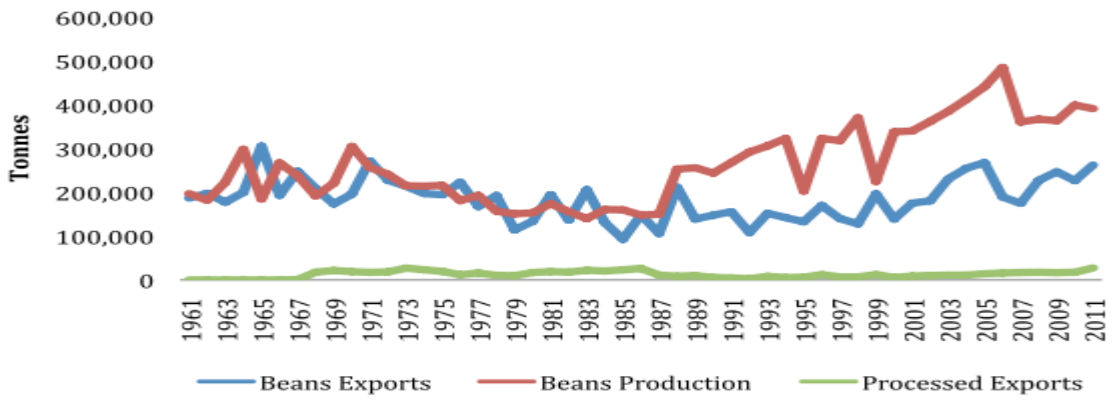
Source: Author with data from Central Bank of Nigeria

Nigeria has not been able to fully integrated into GVCs. However, this is at the aggregated level. What potentiel sectors the country could consider in order to fully integrate any GVC?

2. Nigerian GVC participation as a development strategy

Nigeria has adopted an industrial development plan in 2014 that should lead the country to the structural transformation from its state of predominantly agrarian to a predominantly industrial country. The aim of such supportive policy is to overcome the challenge of limited economic transformation and diversification. However, as highlights in figure 15, the economy continues to rely on oil and gas which are the country primary commodities. Moreover, even commodities like cocoa are not much processed (fig 16). Nigeria is the fourth world producer (behind Côte d'Ivoire, Indonesia, and Ghana) weightingg around 8% of the global production. This situation is probably due to weak production capacity to transform the raw material.

FIGURE 16: COCOA PRODUCTION AND EXPORTS IN NIGERIA



Source:: FAO

In this context, and due to the growing fragmentation of production across borders that occurred during the last two decades, there is an alternative to reach the industrial phase that Nigeria is looking for. GVCs can be an important avenue for Nigeria to build productive capacity which will support the upgrading of domesticc firms and shift the export pattern from raw material-based exports to exports of gradually increasing sophistication. As discusseds in chapter 2, developing economies that engaged in GVCs have been able to increase their GDP on average by 3% more.

In order to benefit from the advantages associated with GVC participation, the country could integrate this global production network by focusing on its comparative advantages.

Nigeria could draw on advantages like agricultural commodities in which it is abundant (cocoa, palm produce, cassava, soybeans, maize, etc) as well as the favorable rain pattern which could contribute to increase agricultural production. Those productst also provide the economy an opportunity to add some value before engaging a GVC.

The population of about 200 million inhabitants is an additional advantage which could help to turn the country to an assembly oriented economy and create jobs for the youths. By adopting GVC as a development strategy, the country will have to integrate into its development plan, a supportive policies for being part of GVC.

CONCLUSIONS THOUGHTS ON CHALLENGES AND BENEFITS OF GVCs FOR DEVELOPING COUNTRIES

Participation in GVCs can provide developing countries with many benefits provided that they meet some challenges and manage some threats.

4.1. Threats of GVCs for Developing Countries

The strategy of partners countries, the nationalism, and environmental concerns constitute some threats of the development of GVCs in the developing world.

4.1.1 Strategy of partner countries

There ca be a change in the strategy of the lead firm which can switch to source from another supplier (Pietrobelli, 2008). Thus, the heavy reliance on GVCs could have serious consequences on developing economies. Indeed, Lead firms decide where to outsource their productive activities based on a minimization cost program. They continuously look for efficiency. Thus, when production cost is high, or business climate have issues, lead firms may reconsider the supply chain framework and this could substantially damage the industrial system built up in the host economies.

Moreover, there is always a dominant partner in a GVCs, framework. It could be either a dominant intermediate supplier or technology provider. The GVCs framework will then be governed by this sole agent or by a small group of them and others will just follow the lead. This brings a lot of vulnerabilities because in case the supplier cut the supply of the specific items due to political, economic or natural reasons, other members of the framework especially the buyers will be worst off. This is more relevant for developing economies as they are generally poorly equippedd to negotiate an agreement that avoids adverse impact on their local productive structure.

4.1.2. Nationalism and environemental concerns

Recently, there has been a rise of populism carried by politicians in major economies in the world including the United States of America. This feeling of nationalism constitute a major threat of the development of GVCs as the goal is to strengthen the productive structure of domestic firms. It could then progressively damage the GVCs framework and destroy the economies that rely on. The case of USA is particularly interesting as this country is the home of many lead firms. The rise of GVCs may have contributed to damage the manufacturing structure of the economy and even the technological related jobs (Dorn & Hanson, 2016). Due to the outsourcing phenomenon, a key feature of GVCs, most of the technological activities and

manufacturing are now located in Asia. This has had the consequences to reduce the number of jobs in major economies and reinforce the idea that those jobs need to be brought back.

Regarding environmental concerns, developing host economy will sometimes face the possible pollution problem during the process of industrialization). Indeed, host economies face challenges in developing regulations that protect their environment and at the same time encourage sustainable development practices and maintain an attractive business climate for foreign investment.

4.2.Challengess of GVCs for Developing Countries

Most developing countries have comparative advantages on the size of the population, a friendly agricultural land, endowmentt in natural resource, etc; but they have to overcome some challenges in order to leverage these comparative advantages. Indeed, the business environment (infrastructure, rule of law, cost and wage competitiveness, etc) needs to be right (IMF, 2015; Del Priete et al, 2017). Also, the development of regional trade flows in Latin America and Africa would also better shelter the region from exogenous external shocks as it was done in Asia.

Developing countries will have to overcome the "middle-income trap" risk that they remain locked into relatively low value-added activities such as exporting mainly primary products within the agriculture and extractive industries (UNCTAD, 2013). In addition to that, more spendings on human capital are required.

4.3. Benefits of GVCs for Developing Countries

GVCs can definitelyy bring many benefits to developing countries. Entering a GVCs can result in increased productivity (Antras and Yeaple, 2014). It also has a positive impact on income per capita (Ignatenko & Borislava, 2018). Firms from developing countries could then overcome their capital and technology disadvantage as they benefit from the growth of international markets, learn and move to higher stages of value chains (Xing, 2016).

There is also an opportunity for upgrading that needs appropriate public policies (Pietrobelli, 2008). Developing-country producers, through the linkages with enterprises from the industrialized countries, can enjoy regular orders which, in turn, enable them to accumulate capital and possibly expand (Gereffi, 1999).

The worldwide proliferation of GVCs opens an alternative path to industrialization.

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