

Original Article

Determinants of Togo's Participation in Global Value Chains

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Received: 06 September 2023

Revised: 15 October 2023

Accepted: 06 November 2023

Published: 23 November 2023

Abstract - This research aims to identify the determinants of Togo's participation in global value chains. To achieve this objective, an econometric analysis of time series is performed. The econometric model is based on the ARDL (autoregressive distributed lag) model developed by Pesaran and Shin (1999). The main results are as follows: Upgrading in the textile and clothing sector is a positive factor in GVC participation for Togo. Each improvement in the capital stock results in a country's greater participation in GVCs, and the effect is more pronounced for the manufacturing and service sectors than for the agricultural and industrial sectors. Skilled labor favors Togo's participation in GVCs, but low-skilled labor does not. Better institutional quality is linked to greater participation in GVCs. They mitigate the risk of non-performance and, in turn, favor participation in GVCs.

Keywords - ARDL, Determinants, Global value chains, Togo, Upgrading.

1. Introduction

In the 1990s, several countries, including Poland and Vietnam, opted for an industrial strategy based on global value chains (GVCs), i.e. participation in the intermediate goods trade. By contrast, other countries, such as Argentina, preferred to develop national industries, with the entire production process occurring within the country. Over the following two decades, the first group of countries experienced an expansion of their industry, developed other related industries, and created jobs, while the second group experienced a stagnation of these industries (Fernandes et al., 2020 Word Bank, 2019). Participation in global value chains, therefore, determines growth outlooks, particularly for developing countries (OECD et al., 2014).

The term value chain refers to the decomposition of the production process by companies through the segmentation of the production process of a good or service into several operations carried out by different companies. Value chains are "global" when they include stages, processes, and actors from at least two countries (TOURA and BOUBRAHIMI, 2023). The value chain principle culminates earlier contributions to specialization and the international division of labor (Kherrazi, 2015).

This theory stems from the work of Smith (1776). It states that each country is interested in specializing in the good for which it is most efficient, selling this good on international markets to be able to import at an advantageous price the goods for which the country is least efficient. As a result, countries do not all work on the same products and trade their production with each other. Considering splitting the production process into different sections due to the GVC, each country specializes in one section.

Smith's theory of absolute advantage (1776) contains the limitation of a single country specializing in producing all goods. Ricardo (1817) introduced the comparative advantage theory to improve Smith's work. For him, it was a comparative advantage, not an absolute advantage, that was considered necessary and sufficient to ensure mutually profitable trade between nations, justifying complete specialization in the specific product and presenting a comparative advantage in terms of labor hours used per unit of production. However, this theory also has the limitation of considering a single factor of production for a country. If producing a good requires more capital and less labor, it is said to be capital-intensive.

Similarly, a country can be endowed with more capital than labor: it is said to be abundantly endowed with capital. So, according to Heckscher-Ohlin (Heckscher (1919) and Ohlin (1933), for there to be a gain in trade, such a country must specialize in the production of capital-intensive goods. Indeed, the Heckscher-Ohlin theorem states that a country exports capital-intensive goods in terms of the factors with which it is relatively well endowed. Based on this theory, stages in the production process that require more labor than capital should be carried out in labor-abundant countries. Vis-versa for capital-abundant countries with capital-intensive goods.

Vernon (1966) explains the location of a good's production in a country according to the theory of the international production cycle. Different phases characterize the life cycle of a good. During the innovation phase, the innovative product is manufactured in highly industrialized countries with the necessary technical capacity and skilled labor, and exported to the rest of the



world. During the growth phase, production is relocated from high-income to middle-income countries. When the product reaches maturity, production relocates to low-income countries with lower labor costs.

While traditional trade theories explain international trade by the existence of heterogeneities between economies, since the late 1970s, international trade theorists (Krugman, 1979 & Helpman and Krugman, 1987) have proposed new explanations for trade based on market imperfection due to the existence of economies of scale, consumers' taste for variety, rationalization and competitiveness effects, in this way, they explain trade between similar countries and intra-industry trade that traditional theories fail to explain. Based on the hypotheses of external economies of scale but internal to the industry, the production of a good that until now was attributed to a single country based on comparative advantage, production reaches a global level in terms of location. This makes it possible to reduce costs on a global scale while relocating production from areas/economies where it is less profitable (Krugman 1981; Ethier 1982). This theory thus explains the offshoring of production, a practice that has accelerated the emergence of global value chains, as production process sections are distributed across different economies.

As with economies of scale, which distort perfect competition, product differentiation induced by consumers' taste for variety induces product differentiation in either economy for individual varieties produced by the same industry. On this basis, firms adopt price discrimination/dumping to maximize their revenues by taking advantage of the different demand elasticities prevailing for the same good in the two economies. International trade is thus explained by an economy's ability to adopt practices that attract consumers. Hence, the notion of "strategic trade" was introduced by Brander and Spencer (1985) and supported by Krugman and Obstfeld (1992). With strategic trade practices, the state (governmental organizations) is also a player in determining the specialization of economies and determines which countries export which goods by mobilizing resources from one industry to another to maximize the gains from international trade according to industrial policies (Krugman 1994).

African economies, as Dollar (2016) points out, have little involvement in GVCs. As a whole, the continent participates in global value chains in only a handful of sectors. These are the business services, textile, agri-food, and automotive sectors. The continent's integration into international trade remains very low: 2% for traditional trade and 3% of world trade in intermediate goods (World Bank, 2019). In most cases, African countries enter value chains at the very beginning. They feed other countries' exports with inputs through their exports. This reflects the predominance of raw materials in the continent's exports.

As far as Togo is concerned, according to BCEAO data (2023), international trade is configured so that exports occur upstream of value-added chains with commodities.

Imports come at the end of the chain when products are at their final consumption stage. This integration means that Togo's participation in global value chains is low. Indeed, Togo adds value to less than 14% of its exports. What's more, less than 13% of foreign value added finds its way into the country's exports, whereas GVC integration is becoming a means of trade expansion and structural transformation (UNCTAD, 2013; AfDB et al., 2014).

Consequently, it seems imperative for Togo to improve its insertion in international trade and, more specifically, its participation in GVCs. This observation has led this research to investigate the following question. What are the determinants of Togo's participation in global value chains?

A review of the existing literature on the determinants of participation in global value chains reveals a relatively small but growing body of work (Banerjee and Zeman, 2020). These works concern groups of countries with heterogeneous economic characteristics. The determinants identified by Banerjee and Zeman (2020) only concern the sample of countries included in the World Input-Output Database (WIOD), mainly European countries. Such work cannot guide economic policy in Africa. Mouanda-Mouanda and Gong, 2019, on the other hand, looked at landlocked countries worldwide, comparing those in Africa and non-Africa. They show that the determinants of global value chains influence the participation of the two groups of landlocked countries differently. Other authors have focused on Africa specifically, including Kriljenko (2016), who has worked in sub-Saharan Africa. The latter finds that participation in GVCs is not determined by market size, nor by the quality of infrastructure, but rather by access to credit and human capital. Looking at work on ECOWAS (Olarinde (2021), Obasaju (2019) and Tinta (2017), it emerges that the size of the economy and the quality of infrastructure have a positive and statistically significant effect on participation in GVCs (Olarinde, 2021). However, Togo is both a sub-Saharan African and an ECOWAS country. This literature is, therefore, unable to give a definitive opinion on the subject.

Regarding Togo, in particular, the literature review does not mention any research on this topic. The great heterogeneity of the samples used, covering both countries whose economic characteristics differ from those of Togo and nearby countries, may play a role in this ambiguity. Faced with these mixed results, this research attempts to contribute to the literature by focusing on the case of Togo. It seeks to identify the factors influencing Togo's participation in GVCs. This research aims to empirically identify the determinants of Togo's participation in GVCs. This research brings several added values to the literature. It uses a time series analysis with the ARDL method (autoregressive backward scaled model), which has not yet been used to analyze MVC disruptors. It also provides new economic policy perspectives for Togo.

To achieve the objective of this research, the remainder of the paper is organized into four sections. The next section

(section 2) presents the empirical debate on the determinants of country participation in global value chains. Section 3 presents a factual analysis of the case of Togo. The estimation strategy and data are reported in section 4. Section 5 discusses the results. Conclusions are presented in the final section.

2. Literature Review

Participating in global value chains requires knowledge of their determinants. To explore the existing literature beneficially, a thematic plan is adopted. This option offers the possibility of understanding why a variable explains participation in GVCs in one context but not another. Furthermore, this research can contrast the work that argues that structural factors determine participation in GVCs with the work demonstrating that political factors determine participation in GVCs. Our literature review is therefore organized under two main headings, according to the following themes.

2.1. Structural Variables and Global Value Chains

Structural factors are defined by Kowalski et al. (2015) as those factors beyond policy reach, at least in the short and medium term.

2.1.1. Size of the Economy

The review of the literature reveals mixed empirical results. Indeed, they are sensitive to methodology, sample composition, and temporal coverage. Concerning the size of the economy, generally measured by gross domestic product or national income, various research studies show that it contributes positively to participation in global value chains. Banerjee and Zeman (2020) used a sample of 43 countries for the period 2000-2014 from the World Input Output Database (WIOD). The data indicate that the larger the size of the economy, the less the country participates in GVCs. Olarinde (2021) obtained the opposite result by analyzing the relationship between country size and participation in GVCs in the ECOWAS context.

Using data from the World Bank's 2005 Investment Climate Survey, Dollar et al. (2016) attempted to understand the disparity between countries in their participation in GVCs. They arrived at the result that the probability of participation in GVCs is positively correlated with the level of economic development. With other data, Mouanda-Mouanda and Gong (2019) arrive at similar results. These authors thus find that domestic market size, represented by real GDP, positively and significantly affects downstream participation in landlocked countries located in Africa but negatively in non-African landlocked countries, except for complex upstream GVCs. This result shows that the size of the domestic market is likely to increase value-added trade for countries specializing in upstream activities as opposed to downstream ones. Kriljenko et al. (2016) widen the scope of analysis to all Sub-Saharan African countries. These two studies use the same indicator of economic size but arrive at divergent results. Indeed, Kriljenko et al. (2016) find that real GDP significantly and negatively affects the participation of sub-Saharan African countries in GVCs.

2.1.2. Availability of Skilled Workers

GVC indices have also been regressed on human capital by various authors, including Kriljenko et al. (2016), Wonyra and Okah (2020) and Urata and Baek (2020). The work of the latter, in particular Urata and Baek (2020), shows that the availability of skilled workers is important for companies to participate and increase their involvement in global value chains. Their research was based on World Bank business survey data, which covers 111 countries and 38,966 companies for the period 2009-2018. This work revealed that the more skilled an economy's workforce, the greater its participation in global value chains. This positive effect confirms the findings of Kriljenko et al. (2016): "...deeper integration into global value chains is found to be associated with better human capital indicators". The work of Wonyra and Okah (2020) distinguishes between what happens in the short term and the long: "In the short term, human capital has a positive effect on the participation of sub-Saharan African GVCs".

Olarinde (2021) corroborates the positive effect of skilled workers. However, the author reveals that when the effect of total labor on GVCs is examined, a significant negative effect on GVCs emerges. On the question of skilled labor, Banerjee and Zeman (2020) find that workers with tertiary education do not significantly influence participation in GVCs. They include other proxy measures for labor skills, but this makes no difference to the results.

For Mouanda-Mouanda and Gong (2019), the negative influence of skilled workers on GVC participation is not to be generalized but is observed in landlocked natio.

2.1.3. Quality of Governance and Quality of Institutions

"Improving the quality of institutions reduces the participation of developing countries in GVCs" Wonyra and Okah (2020). Through this conclusion, these authors confirm the results obtained by other predecessors, including Dollar & Kidder (2017), Allard et al. (2016), Dollar et al. (2016), and Miranda & Wagner (2015). They explain this by the fact that upstream countries have favored countries with weak institutions to gain access to raw materials. Obasaju et al. (2019) corroborate this inverse relationship with data from ECOWAS.

The work of Dollar and Yu (2016) found contrary results. The results suggest that less government intervention, greater customs efficiency, better contract enforcement, and better access to bank loans significantly increase the likelihood of companies getting involved in GVCs.

2.1.4. Capital Endowments

The endowment of physical capital is a very important factor in the economic development of any country. The same applies to participation in global value chains. This is what Banerjee and Zeman (2020) set out to demonstrate in their research. Indeed, according to their work, the greater a country's physical capital endowment relative to output, the higher its VAX ratio. Their regression results indicate

abundant physical capital is associated with an upstream position in global value chains. As for Wonyra and Okah (2020), physical capital positively affects developing countries' participation in GVCs only in the short term.

2.2. Economic Policy Variables and Global Value Chains

A policy variable is a variable that results from a discretionary choice by decision-makers. Contrary to Kowalski et al. (2015), some authors' research has demonstrated a link between participation in global value chains and policy variables.

2.2.1. Credit to the Economy

Credit to the economy, particularly export credit, is renowned for its positive effect on exports. This was demonstrated by Paravisini et al. (2015). Mouanda-Mouanda and Gong in 2019 showed that access to domestic credit negatively influences GVCs for geographically disadvantaged African and non-African nations in downstream linkages. In contrast, domestic credit positively and significantly affects the share of foreign value added in non-African landlocked countries. However, Wonyra and Okah (2020) find that, in the long term, financial capital plays the most important role in developing GVCs within a developing country.

Some authors have analyzed the role of access to credit in participation in GVCs at the company level. Following this logic, Orlic, in 2016, demonstrated that access to commercial bank credit positively and significantly affects GVCs for all companies. However, the positive effects of access to credit increase with firm size (Kuntchev et al., 2013), as larger firms are more likely to overcome information asymmetry by providing collateral and can more easily communicate their creditworthiness. Furthermore, they find that large companies with access to credit are more likely to participate in a GVC (52%) than small companies (32%).

2.2.2. Directs Foreign Direct Investment Flows

On the subject of FDI, Banerjee and Zeman (2020) find that FDI explains participation in GVCs on a case-by-case basis. For them, higher stocks of inward FDI are associated with higher backward linkages and a higher participation rate in GVCs. At the same time, inward FDI is not statistically significant in explaining downstream linkages and is significantly associated with a more downstream position in GVCs. These results are partially confirmed by the work of Kowalski et al. carried out in 2015. For these authors, the measure of openness revealed to inward FDI tends to have a significant positive impact on upstream integration, while the impact on downstream integration is insignificant.

The sectoral analysis carried out by these authors gives prominence to foreign direct investment, as they conclude that revealed openness to FDI has a more consistent positive impact on upstream integration in agriculture, mining and quarrying, services, and most manufacturing sectors. The strongest determinant of upstream participation in the

services sector is revealed openness to FDI. Obasaju et al. (2019) confirm a link between FDI and participation in GVCs using the generalized method of moments. In their econometric analysis, they find that the coefficient of the FDI variable carries a positive sign, but it is also insignificant.

2.2.3. Trade Policies

Following his analyses, Kriljenko et al. (2016) find that participation in GVCs is hampered by higher tariff levels and difficult trading environments in sub-Saharan Africa. Reducing tariff rates across sub-Saharan Africa towards the average prevailing in non-sub-Saharan African countries could increase the share of foreign value added in exports.

Similarly, Cheng et al. (2015) use data on different geographical regions (Asian countries) to regress participation in global value chains on trade policy. Their regression includes some conventional control variables. Cheng and co-authors reveal that tariffs and investment restrictions, as well as trade restrictions, hurt participation in global value chains.

The negative impact of tariffs is also seen when the economies studied are limited to landlocked countries. Indeed, Mouanda-Mouanda's 2019 research with other authors reveals that tariffs have a negative and significant impact on the supply of simple and complex value chains for African landlocked countries most involved in upstream specialization. The results are the same for a study confined to ECOWAS (Obasaju, 2019).

On the other hand, the expected effect of regional integration is blunted by tariff barriers. In other words, increasing the share of intra-regional imports of intermediates by one million dollars would create around three times the current value of the foreign value-added content of exports. Although this contribution seems enormous, it is not significant. Regional economic integration, therefore, makes no significant contribution to the upstream integration of its member countries. This conclusion is in line with that of Tinta (2017), who used a fixed-effect panel model and found that intra-regional trade (which this author called intra-community) has a positive impact on the upstream integration of ECOWAS member states in GVCs and a significant extent.

2.2.4. Exchange Rate

Very few authors have examined the relationship between participation in global value chains and the real exchange rate. However, Banerjee and Zeman (2020) and Olarinde (2021) have estimated this relationship econometrically. According to the results of Banerjee and Zeman (2020), the real exchange rate (REER) has a significant positive relationship with the VAX ratio. Indeed, his work corroborates that of Caraballo and Jiang (2016). The positive relationship between these two quantities manifests the exchange rate elasticity of export value-added, which is smaller than the exchange rate elasticity of gross exports. The real exchange rate also shows a significant

negative relationship with the overall participation rate in global value chains, suggesting that an appreciating real exchange rate hinders integration into global value chains.

In contrast, Olarinde (2021) finds that the exchange rate has a significant positive impact on global value chains in the ECOWAS region, which also contradicts Azmat and Biman (2006), whose result confirms a positive but insignificant impact.

A literature review has enabled the identification of the variables likely to influence an economy’s participation in GVCs. This previous work’s analysis shows that structural and policy factors affect participation in GVCs. This observation is the result of considering several works with different geographical areas. This research will particularly focus on Togo in the remainder of our research.

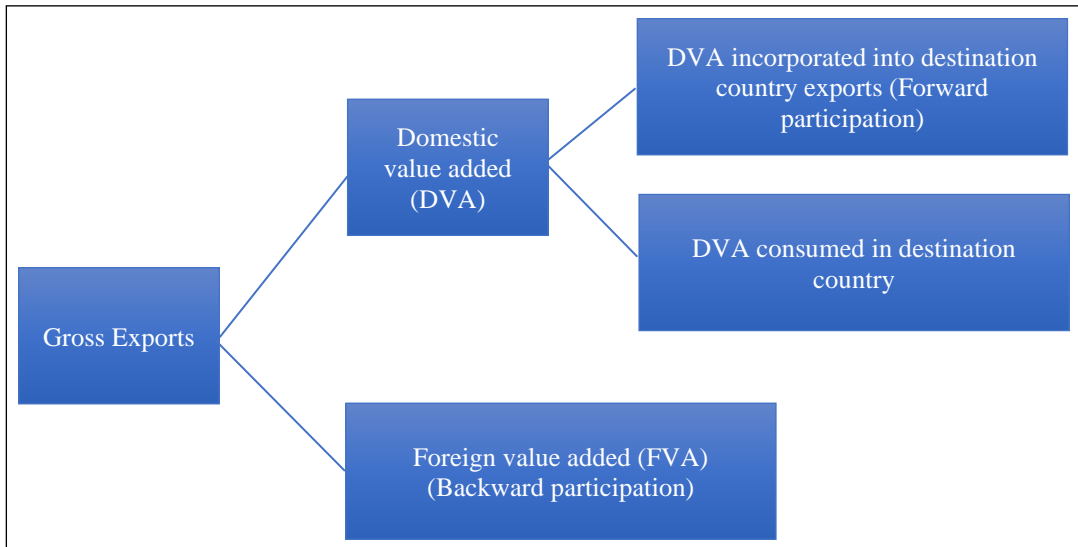
3. A Brief Analysis of Togo’s Value-Added Trade

Conventional trade statistics do not accurately reflect value-added trade statistics. In this context, to obtain a correct assessment of the changes taking place in trade patterns and the growing interconnections in the global economy, researchers in the field have set out to go beyond the crude

measurement of trade and directly measure value-added trade and participation in global value chains.

3.1. Definition and Measures of CVM Participation

The theoretical method for calculating trade in value-added was first proposed by Hummels et al. (2001), and the accounting framework was developed and improved by Johnson and Noguera (2012) and Koopman et al. (2010, 2014). The work of these authors has led to a distinction between domestic value added (DVA), also known as forward participation, and foreign value added (FVA), also known as backward participation. Each component is defined by the origin of the value added incorporated into exports. Forward participation (DVA) refers to the domestic value added used as inputs to produce exports in the destination country. Backward participation (FVA) refers to the value-added imported from a partner country (abroad) and incorporated into domestic exports. Thus, in the chain of an intermediate good that passes through several countries, gross exports can be broken down into two categories. Imported inputs and inputs obtained domestically. Imported inputs constitute foreign value added (FVA) or backward participation. Inputs obtained domestically constitute domestic value added (DVA). When these are used in producing export goods in the destination country, this is referred to as forward participation. The figure below gives a schematic representation.



Source: Author based on Koopman and al (2010)

Fig. 1 Decomposition of gross exports

This breakdown is used to calculate the forward participation index (*Forward_index*), the backward participation index (*Backward_index*), and the global value chain participation index (*GVC_index*).

$$Forward_index = \frac{DVA}{EXP}, backward_index = \frac{FVA}{EXP}, \text{ and}$$

$$GVC_index = Forward_index + Backward_index$$

with *EXP* the value of the country’s gross exports.

Although these two measures (*Forward_index* and *Backward_index*) are expressed as shares of the reference

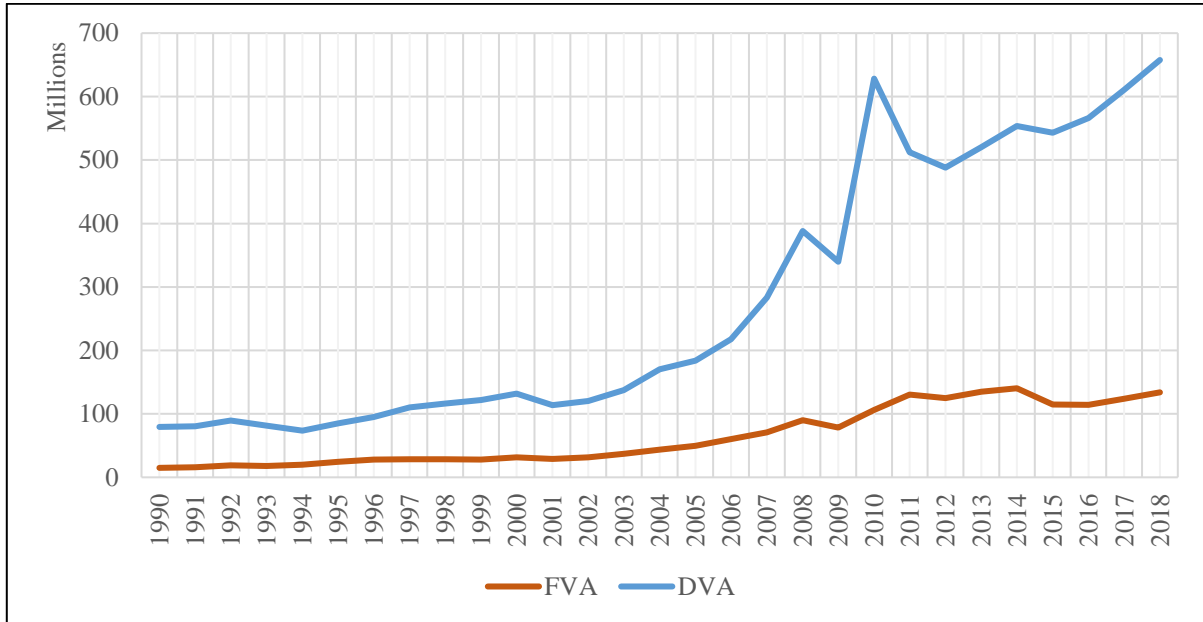
country’s exports, they measure very different forms of involvement. For example, a country that imports intermediate goods assembles them mainly into final consumer goods, and then exports them will have a high *backward_index* involvement but a low measure of *forward_index* involvement. Conversely, a country that mainly supplies intermediate products to an assembler will have a very high *forward_index* participation indicator but a low measure of backward participation. These measures of participation, therefore, give a measure of commitment in the form of buying (backward participation) and selling (forward participation) in global value chains.

3.2. Evolution of Togo's Participation in Global Value Chains

The global share of value-added trade (domestic value-added and foreign value-added combined) in gross world trade increased significantly during the 1990s and early 2000s. But over the last 10 years, it has stagnated or even

declined. However, over half of world trade still involves trade in value-added products (World Bank, 2020).

With particular reference to Togo, data from the EORA database enable us to observe trends in foreign value added (backward participation) and domestic value added (forward participation).

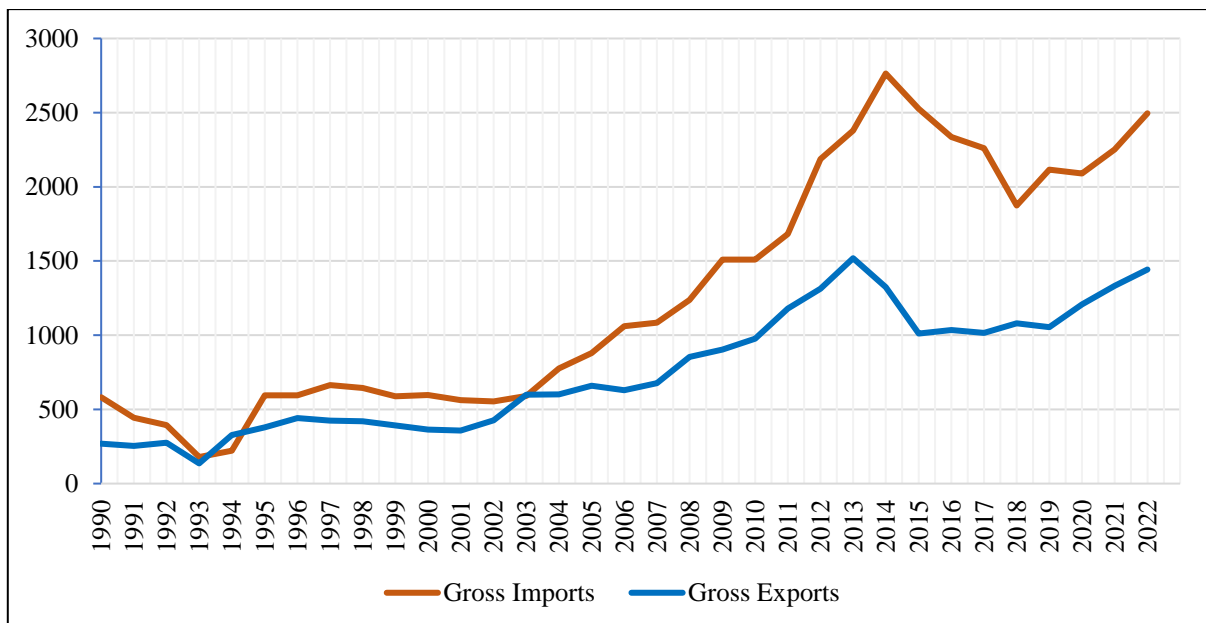


Source: Author based on EORA data

Fig. 2 Trends in global value chain indicators for Togo over the period from 1990 to 2018 (in millions of dollars)

Trends in Togo's participation in global value chains show that the country's domestic value-added exceeds foreign value-added over the entire period from 1990 to 2018. Over the years, the gap between these two entities has widened. Indeed, Togo's exports of intermediate goods to

foreign partners, which the latter use for their exports, are the backbone of Togo's participation in global value chains. A contradictory fact emerges when comparing this observation with the data on Togo's gross exports and imports in the graph below.

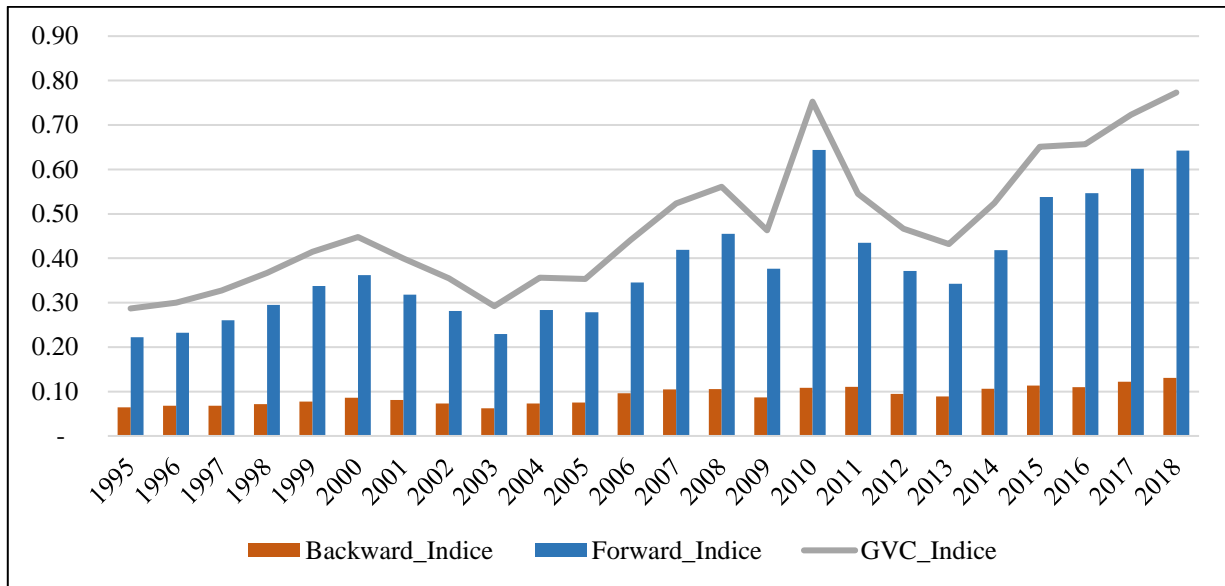


Source: Author based on UNCTADstat data

Fig. 3 Togo's gross imports and exports (in millions of dollars)

In terms of gross trade, Togo imports more than it exports; however, a contrasting trend is apparent when Togo's intermediate goods trade is observed. This raises the question of the structure of Togo's trade. Indeed, importing more consumer goods is not only disadvantageous for the

balance of payments but also a form of exporting the country's jobs. Togo's participation in global value chains is shown below. Forward participation increased overall over the analysis period. However, backward participation remained almost constant and low over the period.



Source: Author based on EORA data

Fig. 4 Trends in Togo's participation in GVCs

4. Methodological Approach and data Presentation

4.1. Model Selection

Our research aims to identify the determinants of participation in GVCs, particularly for Togo. Banerjee and Zeman (2020) raised an obvious point regarding the methodology for analyzing the determinants of global value chains: "There is no common methodology based on a theoretical model to explore the determinants of participation in global value chains". Faced with this difficulty, several studies have estimated regression equations based on the trade gravity model. By way of example, there are Baldwin and Taglioni (2013), Choi (2013), Ignatenko et al. (2019), and Johnson and Noguera (2017). However, it is important to note that the gravity model approach focuses on why countries trade with each other rather than why countries engage in production networks at the aggregate level. In the same vein, Kowalski et al. (2015) argue that the gravity model approach fails to take into account some of the essential features of trade in GVCs. The major limitation of this model is that it does not explain why countries engage in production networks on a global level. Given the limitations of the gravity model, the model developed by Fernandes et al. in 2020 is preferred.

Fernandes et al. (2020) set out to provide a single empirical framework for jointly testing the role of the different determinants highlighted in the literature as important for global value chains. The methodological orientations of their work are based on those of Kowalski et al. (2015).

The field of analysis of the above-mentioned authors covers several countries and several years. As a result, they use the panel model. In contrast, our research covers just one country, Togo, and several years. This circumstance calls for a time-series analysis. The econometric time series model is based on the ARDL (autoregressive distributed lag) model, an autoregressive model with staggered lags developed by Pesaran and Shin (1999) and extended by Pesaran et al. (2001). The choice of this model is justified by its ability to consider both the short-term and long-term relationships of the variables involved.

4.2. Spécification de l'équation and Mesure des Variables

➤ Theoretical specification

The theoretical specification of the staggered-delay autoregressive model equation is as follows.

$$\Delta y_t = \alpha_0 + \sum_{i=1}^n \alpha_i \Delta y_{t-i} + \sum_{j=0}^m \delta_j \Delta X_{t-j} + \beta_1 y_{t-1} + \beta_2 X_{t-1} + \varepsilon_t \quad (1)$$

Where y_{it} is the dependent variable (participation in the global value chain) at date t and X a vector grouping the independent variables and ε the error term. The expressions α and δ represent the short-term dynamics, and those associated with the parameters β represent the long-term dynamics of the model. n and m are the lag numbers that will be determined by the Akaike criterion.

Variables and sources des données

In this section, the model's variables and their measurements are defined, as well as their sources. They come from different sources and relate solely to Togo.

Dependent variable: Since this research aims to study the determinants of GVC participation and to regress it on the textile and clothing trade, the dependent variable is GVC participation. It is collected from the EORA database of the United Nations Conference on Trade and Development.

In this database, participation in GVCs is measured by five indicators. In our research, this research chooses to measure backward participation (FVA) and forward participation (DVA). The choice of DVA in this chapter is based on its broader understanding of the notion of downstream integration.

Foreign value added (FVA) measures imports of intermediate products used in producing export goods (exports from Togo in the case of our research). This corresponds to the backward participation component.

Domestic value added (DVA) measures the domestic value added contained in total exports. This indicator is a component of forward participation.

4.2.1. Independent Variables

In equation (1), the vector of explanatory variables is represented by X. According to Fernandes et al. (2022), seven (7) determinants influence participation in GVCs : (i) factor endowments, (ii) geography, (iii) national industrial capacity, (iv) trade policy and FDI, (v) institutional quality, (vi) connectivity and (vii) macroeconomic factors. In addition to these factors, given that this research seeks to measure the effect of trade in the textile and clothing sector on participation in GVCs, this research introduces two variables that are the variables of interest. One is up-market exports in the textile and clothing sector (*UPGtextile*), and the other is trade in intermediate goods in the textile and clothing sector (*TradeTextile*). The choice of variables contained in the X vector is as follows.

Factor Endowments

The measurement of this variable used in this research is of two kinds. For capital endowment, this research uses the ratio of capital stock to GDP (*CapitalStock*). For labor, two variables are used. One measures the volume of manpower (*Labor*), and the other measures human capital (*human capital*).

Geographical Situation

Our model does not include a variable measuring geographical distance, as our analysis concerns a single country. In this circumstance, the variable becomes a constant parameter. The correct specification of our model without this variable was tested.

National Industrial Capacity

National industrial capacity is measured by national manufacturing value added (*VAmufac*).

Trade Policy and Foreign Direct Investment

Trade policy and FDI are important for traditional trade, but they can play an even more important role for GVC

trade, as intermediate and semi-finished products cross international borders several times. Tariffs imposed by partner countries can also increase export costs. Therefore, a variable in our model is used to measure the tariff applied (*TarifApl*).

Countries can attract FDI to overcome the relative scarcity of capital, technology, and knowledge and thus integrate into global value chains.

On this basis, this research introduces into the model a variable to measure the number of preferential trade agreement partners (*NBpartners*) and a variable to measure foreign direct investment (*FDI*).

Institutional Quality

GVC goods are highly contract-intensive. In other words, they often involve numerous exchanges between different companies, each facing a certain risk of non-performance of the contract by the other companies in the chain.

All else being equal, countries with better (more stable) institutions, such as stronger property rights and the rule of law, participate more in GVCs (Dollar and Kidder, 2017). The Worldwide Governance Indicators (WGI) presents governance measures through six (6) indicators that materialize the quality of institutions. The preferred measure in this research is the rule of law index (*Ruleoflaw*).

Macroeconomic Environment

Macroeconomic factors, particularly real exchange rates, can play a role in participation in global value chains. This variable is named (*Exchange rate*) to indicate the real effective exchange rate.

There are two (2) variables of interest in our model *Upgrading in the Textile and Clothing Exports Sector*

In the textile and clothing value chain, particularly in the production segment, UNCTAD data distinguishes three levels of goods exports. The transition from one level to the next is achieved by adding value.

The three levels are exports of cotton fibers(a), yarns and fabrics (b), clothing, and clothing accessories made from textiles(c).

The upgrading ratio (*UPGtextile*) is obtained as shown below and measures the relative share of processing of the basic product, cotton. An increase in this indicator implies an upgrade in exports.

$$UPGtextile = \frac{(b) + (c)}{(a)} \quad (2)$$

The variable import of intermediate goods for the textile and clothing sector (*ImportTextile*). It measures imports of intermediate goods such as yarns, fabrics, and shaped articles.

$$UPGtextile = \frac{(yarns and fabrics) + (clothing and clothing accessories)}{(cotton fibers)} \quad (3)$$

➤ *Functional Specification and Estimation Technique*

The technique for estimating a model with time series data depends on the stationarity of each variable in the model introduced. Ordinary least squares (OLS) is the

appropriate estimation method when all variables are stationary. The stationarity of each variable is studied, and the level of integration of each of them is presented in the table below.

Table 1. Level of stationarity of the model variables

Variable	Stationnarité	Variable	Stationnarité
FVA	I(0)	Exchange rate	I(0)
DVA	I(1)	HumainCapital	I(1)
UPGtextile	I(1)	VAMANufac	I(1)
ImportTextile	I(1)	TarifApl	I(1)
Rule of law	I(1)	Labor	I(1)
NBpatners	I(1)	FDI	I(0)
CapitalStock	I(1)	VAagriculture	I(1)
		VAservice	I(1)

Source: Author's construction

The results in the table above show that the variables are integrated in different orders. The corresponding technique for this option is an autoregressive staggered lag (ARDL) model (Sohag, 2018). The ARDL model can estimate the short- and long-term relationship at the same

time and provides an efficient, unbiased estimate. The most appropriate use of the ARDL model is based on the framework of one equation (Adriush, 2014). Below are the two equations of our model.

4.3. *Modèle DVA*

$$\Delta DVA_t = \alpha_0 + \sum_{i=1}^n \alpha_{1i} \Delta DVA_{t-i} + \sum_{j=0}^m \delta_{1j} \Delta UPGtextile_{t-j} + \sum_{j=0}^m \delta_{2j} \Delta Ruleoflaw_{t-j} + \sum_{j=0}^m \delta_{3j} \Delta NBpatners_{t-j} + \sum_{j=0}^m \delta_{4j} \Delta CapitalStock_{t-j} + \sum_{j=0}^m \delta_{5j} \Delta Exchangerate_{t-j} + \sum_{j=0}^m \delta_{6j} \Delta HumanCapital_{t-j} + \sum_{j=0}^m \delta_{7j} \Delta VAMANufac_{t-j} + \sum_{j=0}^m \delta_{8j} \Delta TarifApl_{t-j} + \sum_{j=0}^m \delta_{9j} \Delta Labor_{t-j} + \sum_{j=0}^m \delta_{10j} \Delta FDI_{t-j} + \beta_1 UPGtextile_{t-j} + \beta_2 Ruleoflaw_{t-j} + \beta_3 NBpatners_{t-j} + \beta_4 CapitalStock_{t-j} + \beta_5 Exchangerate_{t-j} + \beta_6 HumanCapital_{t-j} + \beta_7 VAMANufac_{t-j} + \beta_8 TarifApl_{t-j} + \beta_9 Labor_{t-j} + \beta_{10} \Delta IDE_{t-j} + \varepsilon_t \quad (3)$$

4.4. *Modèle FVA*

$$\Delta FVA_t = \alpha_0 + \sum_{i=1}^n \alpha_{1i} \Delta FVA_{t-i} + \sum_{j=0}^m \delta_{1j} \Delta ImportTextile_{t-j} + \sum_{j=0}^m \delta_{2j} \Delta Ruleoflaw_{t-j} + \sum_{j=0}^m \delta_{3j} \Delta NBpatners_{t-j} + \sum_{j=0}^m \delta_{4j} \Delta CapitalStock_{t-j} + \sum_{j=0}^m \delta_{5j} \Delta Exchangerate_{t-j} + \sum_{j=0}^m \delta_{6j} \Delta HumanCapital_{t-j} + \sum_{j=0}^m \delta_{7j} \Delta VAMANufac_{t-j} + \sum_{j=0}^m \delta_{8j} \Delta TarifApl_{t-j} + \sum_{j=0}^m \delta_{9j} \Delta Labor_{t-j} + \sum_{j=0}^m \delta_{10j} \Delta FDI_{t-j} + \sum_{j=0}^m \delta_{11j} \Delta VAagri_{t-j} + \sum_{j=0}^m \delta_{12j} \Delta VAservices_{t-j} + \beta_1 ImportTextile_{t-j} + \beta_2 Ruleoflaw_{t-j} + \beta_3 NBpatners_{t-j} + \beta_4 CapitalStock_{t-j} + \beta_5 Exchangerate_{t-j} + \beta_6 HumanCapital + \beta_7 VAMANufac_{t-j} + \beta_8 TarifApl_{t-j} + \beta_9 MaindCœuvre_{t-j} + \beta_{10} \Delta FDI_{t-j} + \beta_{11} \Delta VAagri_{t-j} + \beta_{12} \Delta VAservices_{t-j} + \varepsilon_t \quad (3)$$

5. Estimation Results and Discussion

This section presents and discusses the econometric results relating to the functional equations specified above based on data for Togo. This section is structured into two sub-sections, the first of which deals with upgrading in textile and clothing exports and its effect on downstream participation (DVA). The second deals with imports of intermediate goods in the textile and clothing sector and their effect on upstream participation (FVA).

5.1. Upgrading in Textile and Clothing Exports and Domestic Value Added (DVA Model)

Table 2 shows the results of short-term and long-term estimates. According to Lee et al. (2011), upgrading is a favorable factor for participation in global value chains. The

results of our work also lead to similar conclusions. Indeed, Togo's downstream participation regressed on upgrading in textile and clothing exports, giving a positive and significant coefficient at 1%. This result implies that the more value-added Togo's exports incorporate, the greater its participation in downstream GVCs. These results are similar to those of the World Bank (2020), which found that upgrading in Ethiopia, Kenya, and Tanzania led to greater participation in global value chains in the agribusiness, apparel, and manufacturing sectors, respectively.

It is important to note the nuance observed between the short and long term. Indeed, the positive relationship between the two variables is not established in the short term. The positive relationship between the two variables is

not established in the short term. This contradiction could be explained by the adjustments undergone by an economy as a result of upgrading in a given sector. In the specific case of Togo's textile and clothing sector, from year "n" to year "n+1", all else being equal, the volume of cotton lint produced is partially exported, resulting in a drop in GVC participation. The result is the negative effect observed in the short term. This is an up-market operation as the non-exported part is transformed locally to manufacture fabric and clothing articles. The move upgrading in year "n+1" led to a drop in Togo's downstream participation. In the long term, however, intermediate goods derived from cotton lint processing increase downstream participation, on the one hand, through exports to neighboring countries, EU countries, and regional countries. And on the other hand, exports to former trading partners who would prefer to process cotton lint on Togolese territory before shipment for reasons of cheap labor.

The econometric analysis also reveals that among the control variables, several factors positively influence Togo's downstream participation in GVCs. These include capital stock, institutional quality, human capital, the number of preferential trade agreement partners, and the exchange rate.

In terms of factor endowments, labor availability does not affect Togo's value-added exports, while capital endowment has a significant positive influence. Regarding

labor endowment, our results show that the volume of employment is still not the determining factor but rather the workers' skills. If the volume of unskilled workers in the Togolese economy increases, this cannot have any effect on participation in downstream GVCs. However, if workers in the Togolese economy increase their skills, building up substantial human capital, the knock-on effect would be greater participation in downstream GVCs. This reflects the logic that, to further maximize the effects of upgrading in the cotton and textile exports sector, a focus on forming substantial human capital is a good lever. These results concur with those of Diary (2020). This author has shown that Vietnam's prowess in upgrading textile and garment GVCs is linked to the labor factor in this economy.

Togo's downstream participation in global value chains is also sensitive to the quality of its institutions. The results show that improving institutional quality in Togo is beneficial for expanding its trade in intermediate goods. In contrast, the work of other authors has found that improving institutional quality reduces the participation of developing countries in GVCs. This negative effect of governance was found by Allard et al. (2016), Dollar et al. (2016), and Miranda & Wagner (2015). They give different but converging explanations for this fact. The logic is that low-quality institutions favor access to raw materials, which is why upstream countries act to maintain low-quality institutions to gain access to raw materials.

Table 2. Results of domestic value added (DVA) model

Results of the long-term equation					
UPGtextile	0.153*** (8.09)	0.131*** (5.30)	0.144*** (5.94)	0.158*** (9.86)	0.144*** (7.95)
role of law	0.769*** (11.31)	0.927*** (8.94)	0.775*** (13.12)	0.786*** (12.15)	0.752*** (10.69)
Nbpatners	0.0156* (1.82)	0.0350* (1.94)	0.0138 (1.53)	0.0170* (1.97)	0.00790 (0.62)
CapitalStock	0.0800*** (9.75)	0.0745*** (4.32)	0.0831*** (8.28)	0.0804*** (11.02)	0.0826*** (10.72)
HumanCapital	0.890*** (10.42)	0.845*** (6.00)	0.937*** (8.49)	0.821*** (5.41)	0.766*** (6.11)
TarifApl	-0.00290 (-0.45)				
VAMANufac		-0.228 (-1.03)			
FDI			0.0105 (0.67)		
exchange rate				-0.000517 (-0.59)	
labor					0.0586 (1.01)
Results of the short-term equation					
LD.IndiceDVA	0.690*** (3.12)	0.513* (2.05)	0.700*** (3.27)	0.806** (2.49)	0.693*** (3.44)
D. UPGtextile	-0.265*** (-3.14)	-0.162 (-1.67)	-0.244** (-2.61)	-0.315** (-2.61)	-0.256*** (-3.26)
LD. UPGtextile	-0.141** (-2.36)	-0.115* (-2.07)	-0.137** (-2.34)	-0.164* (-2.15)	-0.128** (-2.38)

D. role of law	-0.864**	-0.998**	-0.911**	-1.018**	-0.948***
	(-2.66)	(-2.98)	(-3.05)	(-2.30)	(-3.11)
LD. Role of law	0.355*		0.333*	0.323*	0.360**
	(2.08)		(1.95)	(1.87)	(2.26)
D.NBpatners	0.101**	0.107**	0.115**	0.0936*	0.115**
	(2.47)	(3.12)	(2.80)	(1.93)	(3.04)
D. CapitalStock	-0.133***	-0.0951	-0.135***	-0.143*	-0.143***
	(-3.26)	(-1.69)	(-3.32)	(-1.86)	(-3.80)
LD. CapitalStock		0.0438			
		(1.16)			
D. HumanCapital	4.137	5.896**	3.742	3.048	4.208
	(1.31)	(2.26)	(1.36)	(1.10)	(1.58)
LD. HumanCapital	7.956**	6.250*	8.304**	8.051*	8.970**
	(2.30)	(2.14)	(2.47)	(1.81)	(2.88)
D.VAmanufac		0.512			
		(1.04)			
LD.VAmanufac		1.071**			
		(3.13)			
D. exchange rate				0.00126	
				(1.02)	
D.labor					0.247
					(1.35)
_cons	-5.569***	-5.033***	-5.992***	-5.768**	-5.551***
	(-5.08)	(-3.86)	(-5.47)	(-2.97)	(-5.63)
R-sq	0.928	0.960	0.929	0.933	0.945

t statistics in parentheses

* $p < 0.01$, ** $p < 0.05$, *** $p < 0.01$

5.2. Determinants of Foreign Value Added (FVA model)

In terms of foreign value added (FVA), the channel through which trade influences participation in GVCs is through imports of intermediate goods, which will be transformed, to varying degrees, for re-export elsewhere (export of FVA). As a result, an increase in intermediate or final goods imports could increase a country's upstream participation (FVA).

The empirical results in this section (Table 3) do not entirely support this intuition. In other words, an increase in imports of intermediate textile and clothing goods does not lead to an increase in FVA (Column 1). Togo's imports of intermediate goods in the textile and clothing sector, i.e. fabrics, loincloths, and threads, are mainly used in sewing workshops to manufacture garments to satisfy domestic demand.

However, when the variable relating to the manufacturing sector (column 2) is introduced into the equation, the results are different. In this case, Togo's imports of intermediate goods in the textile and clothing sector positively influence FVA. This could be explained by the fact that textile inputs are used in the manufacturing sector to manufacture semi-finished or finished articles destined for the world market.

This result shows the importance and place of industrialization in GVC participation. Basnett and Pandey (2014) obtained similar results when studying Nepal. They find that the country's low participation in GVCs is caused by industrial development, which faces significant obstacles.

To identify which sectors of the Togolese economy most influence participation in upstream global value chains, representative variables for each sector (manufacturing, agriculture, and services; columns 1, 2, 3, respectively) are added to the estimates. The expected signs for each sector are obtained. Nevertheless, the coefficient is not significant for each sector. The agricultural and service sectors significantly influence Togo's participation in upstream global value chains. An increase of one billion dollars in value added in the agricultural sector is accompanied by a 0.0652 increase in the upstream value-added index. In other words, when a country improves its value added in the agricultural sector, it participates more in GVCs. Similarly, the services sector has a statistically significant influence on Togo's participation in upstream GVCs.

Turning to the role played by factor endowments, the results reveal two notable facts. The first is the importance of capital in participation in upstream global value chains. On the one hand, the coefficient of this variable is statistically significant in all sectoral estimations at the 1% error threshold. It is also economically significant. This result reflects the fact that every improvement in the capital stock results in greater participation by the country in upstream global value chains. The effect is more pronounced for the service sector than for the agricultural and manufacturing sectors. This result confirms the findings of the World Bank (2019) that GVCs are capital-intensive.

The second notable fact about factor endowments relates to the labor factor. Our results show that the volume

of employment is not the determining factor in participation in GVCs but rather the workers' skills. Notwithstanding workers' skills, increasing the number of workers in the Togolese economy does not affect participation in upstream GVCs. However, a growing share of workers with substantial human capital in the Togolese economy significantly boosts participation in upstream GVCs. Some authors find that participation in GVCs is rather detrimental to employment in general (Cali et al. (2016), Rodrik (2018)) in other words, companies that participate in GVCs do not make sufficient use of the employment factor in general. However, the work of Timmer and al (2014) argues that countries with high-skilled labor participate in GVCs by capturing most of the value, while countries that participate with low-skilled workers capture little value added. According to Rodrik (2018), GVC activities are more intensive in skilled labor than low-skilled or unskilled labor. For Togo, openness to foreign direct investment is also a driving factor for participation in upstream global value chains. As the results show, capital formation is an asset for participation in global value chains. Similarly, greater capital formation from foreign direct investment is associated with greater shares of participation in upstream GVCs in the country. The results show a 95% significance level for the relationship between FDI and upstream participation.

Products whose production processes are split up and distributed across different countries are characterized by high contractual intensity (Dollar and Kidder, 2017). In other words, global value chains often involve numerous exchanges between different companies located in different countries, with each company in the chain facing a certain

risk of non-performance. Contract performance also depends on the dissuasive nature of the measures put in place by an economy's institutions to discourage non-performance. In the case of Togo, in particular, the results of this research reveal that better institutional quality, as measured by a higher Rule of Law Index score, is linked to greater participation in upstream global value chains. This reflects the fact that efforts to improve institutional quality in Togo are not in vain. They mitigate the risk of non-performance and, in turn, encourage participation in GVCs. This result is also observed by Amanor (2012) in the Ivorian and Ghanaian economies.

The variable measuring exchange rate is negatively correlated with participation in upstream GVCs, which is unsurprising, given that depreciation discourages imports by raising their prices valued in local currency. It can also improve export competitiveness due to lower export prices. This result confirms the work of Patel et al. (2019), in which they assess the role of the real effective exchange rate in a GVC context.

The positive effect of tariff barriers reflects the effectiveness of protectionist trade policies against foreign competition, particularly from developed countries. Protectionism limits the demand for foreign goods by residents. It increases the demand for locally-produced goods, in turn increasing domestic production of the good, which is then sold on the foreign market, resulting in greater participation in upstream GVCs. On the other hand, Korwatanasakul and Baek (2021) find that non-tariff measures (NTMs) and trade tariffs both hurt participation in upstream GVCs.

Table 3. Results of foreign value added (FVA) model.

Long-term equation results				
importinputtextiles	0.0000173	0.0000484**	0.000183***	0.0000582
	(1.31)	(3.17)	(6.30)	(1.61)
capitalstock	0.0163***	0.0145***	0.0155***	0.0215***
	(5.95)	(7.89)	(5.30)	(3.98)
FDI	0.0165***	0.0151***	0.00826**	-0.00415
	(4.86)	(4.56)	(-2.71)	(-0.84)
role of law	0.0822***	0.0768***	0.0842***	0.0569***
	(8.14)	(8.97)	(9.14)	(4.47)
exchange rate	-0.000443***	-0.000227**	-0.00104***	-0.000941***
	(-3.86)	(-2.81)	(-9.39)	(-6.84)
humancapital	0.194***	0.318***		
	(3.62)	(6.92)		
Labor	0.00565	0.0369	0.000301	0.031
	(-0.47)	(-3.16)	(0.04)	(3.52)
tarifapl	0.00508***			0.00452**
	(3.40)			(2.23)
vamanufac		0.0125		
		(0.72)		
agriva_constmilliardus			0.0652***	

			(5.24)	
servicesva_constmilliardus				0.0363**
				(2.40)
Results of the short-term equation				
LD.indicefva	0.641***	1.077***	0.306**	0.375**
	(4.19)	(5.40)	(2.70)	(2.39)
D. capitalstock	-0.0193**	-0.0460***	-0.00309	-0.0114*
	(-2.87)	(-4.89)	(-0.78)	(-1.77)
LD. capitalstock	-0.0278***	-0.0369***	-0.0173**	-0.0280***
	(-5.31)	(-6.83)	(-3.28)	(-4.22)
D.fdi	-0.0282***	-0.0472***	-0.00844	
	(-3.74)	(-4.73)	(-1.24)	
D. role of law	-0.0495*	0.0219	-0.0258	
	(-2.15)	(0.88)	(-1.25)	
LD. role of law		0.0705***		
		(3.80)		
D. humancapital	-0.540**	-0.385		
	(-3.03)	(-1.92)		
LD. humancapital		0.691**		
		(3.03)		
LD.tarifapl	-0.00487*			
	(-2.01)			
D.importinputtextiles		-0.000111*	-0.000331***	-0.0000687
		(-2.23)	(-5.95)	(-1.45)
D.labor		-0.0478	-0.0675**	
		(-1.50)	(-2.52)	
D.vamanufac		-0.270***		
		(-4.16)		
D.exchangerate			0.000422**	
			(2.58)	
D.agriva_constmilliardus			-0.0171	
			(-1.05)	
D.servicesva_constmilliardus				-0.0396**
				(-2.23)
_cons	-0.778***	-1.328***	-0.0118	-0.175**
	(-3.44)	(-4.16)	(-0.34)	(-2.40)
R-sq	0.953	0.982	0.972	0.885

t statistics in parentheses

* $p < 0.01$, ** $p < 0.05$, *** $p < 0.01$

6. Conclusion and Policy Implications

World trade is characterized by the fragmentation of the production process across the globe. The result is the emergence of value chains. Economists agree that this is an opportunity for the development of low-income economies. Yet the participation of these countries in so-called value chains is marginal. However, it is always possible to increase participation in global value chains if, for a given

economy, the key determinants are known. From this point of view, this research aims to identify the determinants of Togo's participation in global value chains. To achieve this objective, an econometric analysis of time series is performed. The econometric model is based on the ARDL (autoregressive distributed lag) model developed by Pesaran and Shin (1999).

The main findings are as follows: upgrading in the textile and clothing sector is a positive factor in GVC participation. Every improvement in the capital stock results in better country participation in GVCs, and the effect is more pronounced for the manufacturing and service sectors than for the agricultural and industrial sectors. Skilled labor favors Togo's participation in GVCs, but low-skilled labor does not. Better institutional quality is linked to greater participation in GVCs. They mitigate the risk of non-performance and, in turn, favor participation in GVCs.

When the banking system makes it easier for economic agents to access credit, this has the effect of increasing imports of intermediate goods to improve value-added exports.

In terms of economic policy implications, this research recommends accelerating industrialization in the textile and clothing sector, improving human capital in the sector, improving the quality of institutions, and attracting foreign direct investment.

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APPENDIX

APPENDIX 1. Descriptive statistics of model variables

Variable	Obs	Mean	Std. Dev.	Min	Max
IndiceFVA	31	.0652771	.0134807	.0273633	.0816588
IndiceDVA	31	.2797831	.0756319	.1461217	.4843175
UPGtextile	31	.2142317	.2416783	.0128526	.9516841
ImportTextile	31	138.8681	67.88042	50.65794	292.8757
Nbpartners	31	3.309677	1.203704	1.8	5
CapitalStock	31	32.78249	6.872105	26.74015	47.78248
Exchange rate	31	99.41118	9.117066	78.03813	123.3181
HumanCapital	31	1.706866	.092119	1.492104	1.798118
VAmufac	31	.1522118	.104789	.0503044	.3845432
TarifApl	31	13.95831	1.361078	11.577	15.72
Labor	31	2.304513	.5078657	1.508964	3.081904
FDI	31	.6817392	.5996071	.0474797	1.77157
VAagriculture	31	.8560329	.1670463	.584703	1.171878
VAservice	31	.7945024	.2914266	.3760315	1.393075