

African Firms in Global Value Chains: What Can We Learn from Firm-Level Data in Cameroon and Côte d'Ivoire?

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African Firms in Global Value Chains: What Can We Learn from Firm-Level Data in Cameroon and Côte d'Ivoire?

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List of abbreviations and acronyms

AfCFTA	African Continental Free Trade Area
ASEAN	Association of Southeast Asian Nations
CEMAC	Central African Economic and Monetary Community
COMESA	Common Market for Eastern and Southern Africa
DSF	Déclarations Statistiques et Fiscales
EAC	East African Community
EDD	Export Dynamics Database
EU	European Union
FDI	Foreign Direct Investment
GVCs	Global Value Chains
INS	National Institute of Statistics
LPM	Linear Probability Model
MERCOSUR	Southern Common Market (Mercado Común del Sur)
OECD	Organization for Economic Co-operation and Development
RoW	Rest of the World
RTAs	Regional Trade Agreements
SADC	Southern African Development Community
USD	United States Dollar
WAEMU	West African Economic and Monetary Union
WBES	World Bank Enterprise Surveys
WDI	World Development Indicators
WDR	World Development Report
WGI	Worldwide Governance Indicators

Abstract

This scoping paper exploits information from a unique data set constructed by merging firm census and custom data sets from Cameroon and Côte d'Ivoire to analyse the characteristics of firms that participate in global value chains (GVCs) in sub-Saharan Africa. These “GVC firms” are defined as firms that both export and import, with positive production and labour. The paper provides a detailed review of the state of firms' participation in GVCs in Africa and its consequences on trade, employment, and growth. The evidence in Cameroon and Côte d'Ivoire suggests that, in line with literature on firm heterogeneity and trade, firms engaged in GVCs are larger, more productive, and live longer than one-way-traders or domestic firms. Surprisingly, however, there are more GVC firms than pure exporters, a sign of the challenges faced by firms in those countries if they want to sell abroad. The probability of moving into a GVC is higher for exporters than for importers, showing that exporting is a stepping-stone for firms to join a GVC.

Key words: *Global value chains; Firms and trade.*

JEL classification code: *F14.*

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1. Introduction

For developing countries, joining global value chains is a way to accelerate economic development. Firms engaged in a GVC do not need to perform the whole range of tasks required to produce a final product; rather they specialize in the production of simpler parts and tasks, allowing them to exploit their comparative advantage. Such fragmentation of production makes it possible for firms in developing countries, even small ones, to enter foreign markets at lower cost. GVCs rely on foreign sourcing, which takes the form, not only of cheaper and better-quality inputs, but also of more efficient technologies and management practices, as well as access to credit and capital.

Governments need to adapt to this new way of trade. In a GVC world, imports are key for exports. Indeed, countries that have transitioned from commodity-based to manufacturing-based GVCs have seen their imports of intermediate inputs increase: they needed more inputs to feed their expanding export portfolio. Low tariff rates, especially for inputs, are required for GVC and are shown to be correlated with faster development (World Bank, 2020). Moreover, GVCs are structured by private firms' decisions. Of particular importance is the “lead firm”, which stands at the end of the supply chain, caters to consumers' demand and is responsible for organizing the allocation of tasks along the chain across countries. These two features of GVCs, the reliance on imports and on private firms, might conflict governments' objectives and trade strategies. Indeed, many African governments are aiming at deepening industrialization by raising domestic transformation and import substitution. Many of them are also accustomed to a top-down decision-making process, and put large state-owned enterprises in charge of implementing the policies.

Against this background, much is still not known about GVC firms in African countries. This lack of knowledge stems partly from the limited access to disaggregated data on firms and their customs transactions. While these data exist in the countries—as they are collected for administrative purpose, mostly for tax collection—they are seldom available for analysis and research.

This scoping paper, therefore, aims at giving a flavour of the type of questions that could be answered if such detailed data were available in African countries. We focus on two countries, Cameroon and Côte d'Ivoire, for which we have matched firms' and customs data for many years. We explore three broad questions: (i) Which African firms participate in global value chains, and what are their characteristics? (ii) Is the involvement in a GVC sustained over time? (iii) Do we see a shift of GVCs

out of traditional destinations (such as the EU) and towards new destinations (such as emerging countries, including other African countries)? The latter question is of relevance in the context of the African Continental Free Trade Agreement (AfCFTA).

We claim that a micro perspective centred on firms can bring useful stylized facts to African policy makers and help them design more efficient trade and industrialization policies that would allow their countries to reap the benefits of participation in GVCs. One crucial issue regarding African exporters is their low rate of survival (Cadot et al., 2013). In this context, an important question is whether GVC firms manage to survive and stay in a GVC for long. We set out to explore the firms' dynamics and see if participation in a GVC is permanent or temporary, with firms switching back and forth between involvements into a GVC and being a pure exporter, or a pure importer, or not trading abroad at all. In other words, we draw a mobility matrix between different types of involvement into trade, for the same firm, over the years. We also draw another mobility matrix specific to GVC firms and document if GVC firms change their main export destination over time. We interpret the latter criteria as a proxy for the nationality of the lead firm in a GVC. We find out if African firms move between Africa-oriented, OECD-oriented, and Rest of the World oriented GVCs.

Four overarching messages emerge from this analysis. First, GVC firms are rare, but not as rare as pure exporters. In Cameroon, 2% of firms participate in a GVC and in Côte d'Ivoire, 17% of manufacturing firms, while only (respectively) 1% and 2% are pure exporters. Second, GVC firms are larger and more productive than other types of firms. Despite their relatively small numbers, GVC firms represent more than 90% of exports in both countries. Third, GVC firms have greater survival rate, and, in both countries, they are diversifying their export markets. In Côte d'Ivoire, they have oriented away from African countries towards the OECD; while in Cameroon, they are (slightly) moving away from OECD countries. Finally, the probability of transition into a GVC is much higher for pure exporters than for pure importers, suggesting that exporting allows firms to enter imported input markets.

The remainder of this paper is structured as follows. In section 2, we survey briefly what we know on firms in GVCs; Section 3 presents the data and discusses how we can identify GVC firms. Section 4 then compares the characteristics of GVC firms to other firms; while Section 5 examines their survival and mobility into and out GVCs, as well as between their main destinations. Section 6 concludes the study.

2. GVC firms: What do we know?

GVCs, the new face of trade

The fragmentation of production in a value chain across many countries lowers the cost of accessing foreign markets for domestic firms, allowing theoretically more of them to participate in international trade. De Melo and Twum (2020) define GVC participation as the share (over gross exports) of a country's exports that makes use of value-added imported from another country (backward linkage) or is exported to another for further processing (forward linkage). A list of GVC's measurement indicators based on value-added accounting is further given in Borin and Mancini (2019), with extensions to the bilateral and sectoral dimensions. Such macroeconomic indicators rely on global input-output matrix which faces two limitations: the matching between input-output production tables and customs data is difficult; as a result, the level of sectoral disaggregation of global input-output matrix (by sectors and countries) is often not detailed enough for GVC flows.

Microeconomic indicators of GVCs are based on firm-level data such as the World Bank Enterprise Surveys (WBES), or less frequently, firms' census which are available in specific countries and customs data—some of them available in the Export Dynamics Database (EDD). WBES are repeated cross-sections of a sample of firms, while the EDD follows exporting firms over time but does not include information on their imports. Microeconomic indicators are limited by the difficulty of tracing firm-to-firm transactions across countries. DAVIS and Zaki (2020) compare four definitions of GVC firms based on WBES. The first definition, the broadest one, designates a firm as a GVC firm if it is simultaneously exporting and importing. The second and the third definitions add respectively to the first one, having an international certification, a sign of quality that is sometimes required to join a GVC; or having some share of capital owned by a foreign firm. The last, and most restrictive definition, combines the four criteria. In this paper, we will focus on the first definition.

The 2020 World Development Report (WDR) highlights that GVCs can deepen economic growth, create better jobs, and reduce poverty. GVCs can also reduce the gender gap on wages and jobs although women are often working in lower value-added segments of GVCs.

Also, the gains from GVCs are not equally shared between countries and firms. Regions such as North America, Western Europe, and East Asia are more integrated

into GVCs and with higher value-added, compared to other regions such as Africa, Central Asia, and Latin America that are involved in commodity-based GVCs with fewer linkages.

While the economic benefit of participation in GVCs is well documented, there are growing concerns around the environmental impacts on the international fragmentation of production (Wiedmann & Lenzen, 2018). GVCs can contribute to the harmful effects on the environment as their development can lead to higher carbon gas emission associated with trade and pollution by plastics waste. GVCs are also often associated with the overexploitation of natural resources. Last, because GVC firms agglomerate in urban centres to access inputs, infrastructure and services, their expansion may contribute to reinforcing spatial inequality within a country.

What determines a firm's participation in a GVC? According to World Bank (2020), the fundamental drivers are: (i) factor endowments (such as labour, natural resources, and availability of foreign capital), (ii) market size (of the country itself and its hinterland); (iii) geography (sea, land, and air connections); and (iv) institutional quality. Firms, in general, are facing constraints in integrating a GVC such as the number of procedures for international trade or taxes (Dovis & Zaki, 2020). Higher tariffs in a sector reduce the probability to enter into GVC, especially for small firms. Thus, trade liberalization policies are a powerful force for GVC integration and among them, deep trade agreements which harmonize the regulatory environment across a member countries and streamline border procedures. This point is emphasized by Regolo (2017) who shows that new products are exported to relatively accessible markets in comparison to traditional products. Such markets are characterized by geographic and cultural proximity. Thus, participation in a GVC can explain the emergence of new trade flows that can deepen regional trade agreements (RTAs).

The literature shows that few firms engage in international trade (Bernard & Jensen 1997; Van Biesebroeck & Mensah 2019). Export concentration is very high (Easterly & Reshef, 2014) and in the hands of a small number of firms. Two-way traders (firms that both export and import) account on average for about 15% of all trading firms in a given country while capturing almost 80% of its total trade (Dovis & Zaki, 2020; World Bank, 2020). Such firms are large economy-wide—the superstars, the top 1% of the firm distribution (Freund & Pierola, 2015), or at least dominant at the level of their sector (Gaubert & Itskhoki, 2021; Jaud et al. 2021). These firms are so significant that their idiosyncratic shocks might shape the country's comparative advantage. A large literature shows that firms engaged in international trade and investment pay higher wages and offer better working conditions than otherwise similar firms in the host economy (Brambilla et al., 2012). Moreover, foreign companies' presence has positive effects on the productivity and performance of domestic firms, through spillovers of knowledge and technology (Javorcik et al., 2018).

The dynamics of entry and survival of firms on international markets is shaped by selection that favours firms that have improved their fundamentals by investing, hiring or improving the quality of their products (Alvarez & Lopez, 2005; Iacovone & Javorcik, 2012). Selection among firms is even more challenging

in the case of African firms because they have a low survival rate in their first years of exports (Cadot et al., 2013). Recent papers show the determinants of the survival of exporting firms. Edwards et al. (2018), Chacha and Edwards (2018), and Türkcan et al. (2022) use customs data to study trade margins and export survival of firms, mostly in Kenya. Chacha and Edwards (2018) study firms' decision to sell in a foreign market and show that it is negatively impacted by fragility in the destination country (and more by business-related fragility than political-related ones), measured by macroeconomic data from the Worldwide Governance Indicators (WGI).

Edwards et al. (2018) combine customs data and firm-level data on income tax to explain how importing intermediate inputs can influence firm exports in the manufacturing industry. They find that firms that are both exporters and importers have higher productivity and employ more labour compared to other firms. They show that imports increase exports, especially when they come from developed countries. Türkcan et al. (2022) analyse the impact of tariffs on exports sales, margins, and survival of firms in Kenya using customs data over the period 2006–2018. They show that an increase in tariffs leads to a reduction of exports sales at the intensive margin while leaving the extensive margin unaffected. Using a duration model, they also show that a 1% increase in tariffs reduces export survival rate by 2.7%. This result highlights the importance of tariff reduction in trade agreements in order to help firms enter and survive in GVCs.

In their research of the determinants of success upon entry into the export market in four African countries (Malawi, Mali, Senegal, and Tanzania), Cadot et al. (2013) show the existence of cross-firm externalities using firm-level data. An exporting firm benefits from clustering, the fact that other firms of the same origin sell similar products to the same destination: such experience helps the firm access credit (as banks can guess the chance of success if they lend to her), solving the problem of asymmetric information. Using firm-level data in Ghana, Mohammed (2018) finds that the probability to survive is explained positively by firm's characteristics such as age, size, and export intensity. The fact that a firm exports a final product decreases this probability. A final product has to compete with similar goods produced by developed countries with higher quality. Moreover, developed countries also have high quality standards that can limit imports from low-income countries. Zhu et al. (2019) show that GVC firms are more likely to survive longer in exporting, the more so if they improve product quality, have asset-specific investment, and exhibit product diversity.

Firms also learn by exporting (Clerides et al., 1998). In their meta-analysis, Martins and Yang (2009) show that developing countries have more chances than developed countries to improve their productivity by exporting, and especially at the beginning. However, de Loecker and Van Biesebroeck (2018) show that, in assessing the impact of trade on firms' performance, one needs to incorporate the change in market power and the degree of competition induced by trade liberalization.

African GVCs

African countries tend to enter at the very beginning of the supply chain. A high share of their exports serves as inputs for other countries' exports (forward linkages), reflecting the still-predominant role of agriculture and natural resources in their economy. De Melo and Twum (2020, 2021) show that participation in regional agreements is increasing, despite still lagging behind comparator groups such as ASEAN or MERCOSUR. Integration is rising in the EAC, SADC, and COMESA. However, despite the rising number of Regional Economic Communities, African countries have participated mostly in non-regional value chains. De Melo and Twum (2020) highlight three obstacles to the development of regional value chains in Africa: (i) high tariffs on intermediate inputs, (ii) the non-harmonization of rules of origins, and (iii) expensive and unreliable digital connectivity.

In studying the drivers of Ugandan firms into the export market, Niringiye and Tuyiragize (2010) show that firms that are in GVCs are characterized by their high level of capital to labour ratio, their size, their ownership (often Asian), and their line of business (agro-industry and chemistry). For Yameogo and Jammeh (2019), the main factor that can help sub-Saharan African countries' participation in GVCs (forward and backward) is skilled labour. They also highlight the importance of initial human capital endowment on GVC participation at the global level. They show that countries endowed with capital have more chances to benefit from the integration of foreign value-added in their manufacturing exports. Similarly, countries with a net inflow of migrants can better integrate GVCs.

In the ECOWAS, regional and global exporters are larger, more productive, and pay higher wages than domestic firms. High trade costs limit the access of less productive firms to regional and global value chains (Von Uexkull, 2012), a finding that is in line with results highlighted by Bernard and Jensen (1995) on US firms and Isgut (2001) on Colombian manufacturing firms. Van Biesebroeck (2005) shows that trade liberalization can help African firms engaged in GVCs to raise their productivity because they benefit from economies of scale due to the larger export market. He also shows that credit constraints and the risk on the degree of contract enforcement can limit access of domestic firms to GVC.

Evidence from Ethiopia suggests that firms entering GVCs have lower mark-ups than one-way traders (importer only or exporter only) or domestic firms. In addition, Ethiopian firms that are more intensely integrated into a GVC have experienced larger reductions in their mark-ups (Choi et al., 2021). The cross-firm difference in mark-ups reflects the strong competition internationalized firms face and their lack of market power within the chain (Asprilla et al., 2019). This finding recoups a theoretical result obtained by Azam et al. (2001) that shows the possibility of an ambiguous or negative impact of increased competition on the probability for a firm to export and integrate a global value chain. The within-firm decrease in mark-ups over time is concerning, as it suggests that firms in low-income countries that join low value-added segments of GVCs have little opportunities to upgrade and capture more value-added and profits.

3. Data and definition of a GVC firm

This paper focuses on Cameroon and Côte d'Ivoire. Cameroon is the largest and most diversified economy in the Central African Economic and Monetary Community (CEMAC). Cameroon merchandise trade represented 25% of GDP in 2018, down from 40% in 2008 (World Development Indicators [WDI], 2020). This decrease has been driven by the sharp decline in crude oil prices since 2014/2015, crises in the Anglophone regions in the West and Boko Haram attacks in the North. Non-oil exports, which account for 54% of total export of goods, are mostly agriculture and food products (e.g., cocoa, coffee), wood products, gold, and aluminium. Cameroon's pattern of imports is consistent with a country involved in resource-based global value chains with a substantial share in capital goods, such as electrical machinery and transport equipment. In 2018, the share of raw materials in total exports was 58%.

Côte d'Ivoire is the largest economy of the West African Economic and Monetary Union (WAEMU), with one of the highest economic growths in the world, despite recent political and social crises. The country plays an important role in trade with its neighbours, in particular landlocked Mali and Burkina. Côte d'Ivoire's trade is dominated by agriculture: the country is the largest exporter of cocoa beans in the world (40%) and the second exporter of cashew (23%). Its imports are dominated by fuels and oils (19%) and machinery (10%)¹. Côte d'Ivoire mostly participates in agriculture and food GVCs, and its engagement is often limited to supplying specific products, such as cocoa and cashew nuts (World Bank, 2020). The lack of institutional quality and land and property rights in Côte d'Ivoire limit the growth of agri-processing GVCs (World Bank, 2020). According to the 2020 Doing Business Report, Côte d'Ivoire is ranked at the 110th position; for example, it takes more than 200 hours for customs export formalities for sea transport (which takes 13 hours in OECD countries).

Data

In this paper, we use customs transactions data which report exports and imports at the firm, product (HS-6 digit, with potentially about 5,000 products) and partner country; and firms' census which collects information on firms (sale, production, exports, labour, wages, sector, and location). Both data sets are available for Cameroon and Côte d'Ivoire, with different coverage of sectors and years. Figure 1 summarizes the matching procedure. Here a caveat is in order: a significant volume of trade is

conducted informally within the region and thus not reflected in official customs data (Nkendah et al., 2013). A significant share of extra-regional trade is also under-reported: this is the case, for example, of Cameroon's wood exports where there is a gap between direct exports reported by Cameroon and mirror exports (imports declared by Cameroon's partners).

Cameroon data

For Cameroon, we use customs transactions data from 2007 to 2017. Firms' information come from the *Recensement Général des Entreprises* of 2016, an exhaustive census of all economically active units in 2015 and the *Déclarations Statistiques et Fiscales* (DSF) for various years, mostly after 2011, based on reporting to fiscal authorities made by all private enterprises under the OHADA accounting scheme. After matching the firms' data with the customs transactions, we end up with 787,211 firm-year observations, corresponding to 5,607 firms that are present in both data sets, with an additional 39,410 firms that are found only in the firm census (domestic firms).

A potential worrying fact at first glance could be that 121,120 firms in the customs data are not found in the firms' census, even though 2,991 of them are exporting at least once in the period (the rest being importers). However, these firms are all exporting less than US\$1,000 in one year according to the customs data: they are likely to be individual entrepreneurs that can be left out in a study on GVC firms.

Alternatively, 147 firms are reported to be exporting in the firms' census but are not found in the customs data, out of which 30 firms have exports of more than US\$1,000. These firms are likely to sell in neighbouring countries through land borders, without reporting a customs declaration. We leave them out of the scope of the present paper, but it would be interesting to study them further.

Côte d'Ivoire data

In Côte d'Ivoire, we use two sources of data: manufacturing firms' census data and customs data. Firm-level data cover the universe of formal manufacturing firms in Côte d'Ivoire from 2013 to 2016, collected by the National Institute of Statistics (INS). We refer to each establishment as "firm" instead of "plant" as almost all the establishments have only one branch. The manufacturing census data contains information on firms' size, sales, exports, and productivity. The custom data is also collected by the INS from 2013 to 2016. For the purpose of this analysis, we focus on manufacturing firms in the custom data as well, which significantly reduces the number of observations, as all other sectors in the custom data are dropped from the sample.

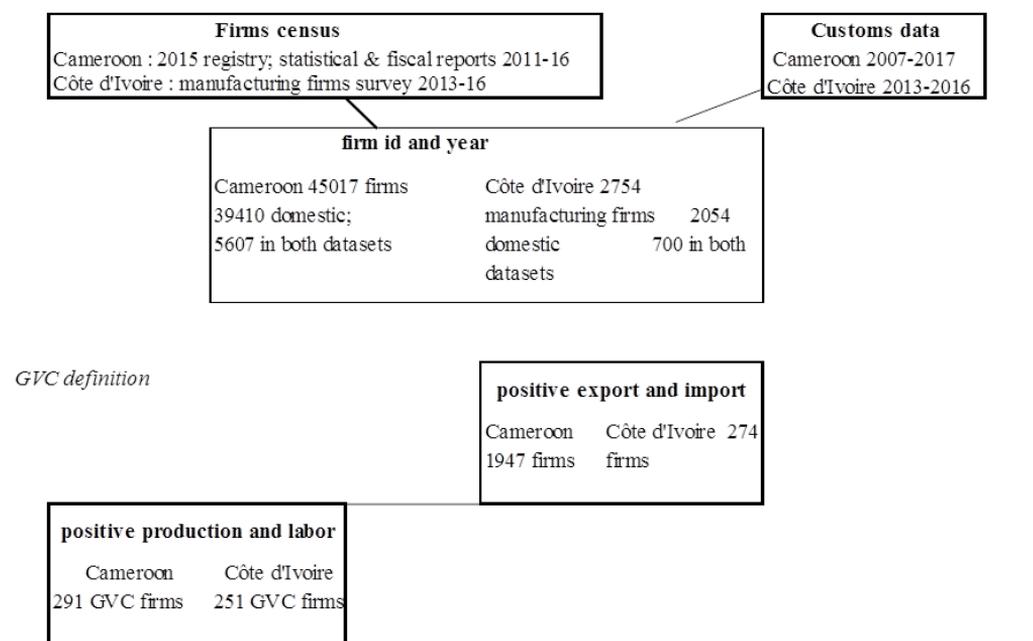
Using a unique identifier, we merge firms' census with the custom data and end up with 2,754 manufacturing firms, of which 2,054 are domestic, 381 are pure importers, 45 are pure exporters, and 274 are exporter-importers.

Yet, each year, about 100 firms are exporting according to customs while they do not report exporting in the firms' census. Alternatively, about 20 firms that report exporting in the firms' census are not found in the customs data of the same year. These firms could export in neighbouring countries without reporting to customs authorities. They might also sell abroad through intermediaries such as freight forwarders.

There are even more discrepancies on the import side: 97 firms declare in the firms' census that they import some inputs while they are not according to customs data; and about 400 firms are importing according to customs data while not buying foreign inputs according to the firms' census. The import gap between the two data sources is coming from the fact that firms' census report imported *inputs*, while customs transactions collect any type of imports, be they intermediate or final products.

In the following, we define the trade status of firms based solely on information available in customs, because the latter report the destination country which we will use below in order to determine the type of GVCs.

Figure 1: Firms census and customs data matching and the definition of GVC firms



Who are the GVC firms?

How can we identify GVC firms? In this paper, we take advantage of our matched data set and define a firm as being active in a GVC if she is both exporting and importing in the same year according to customs data while showing a positive production value in the firms' census.² Being a two-way trader (both exporting and importing) is indeed associated with GVC participation (World Bank, 2020). Notice

that we take here any type of imports in the customs data. We could have been more selective and only taken into account imported *inputs*, such as equipment goods. However, a firm might also use a final product (such as a cardboard box or a bottle) as an input.

When we match customs data with firm surveys, we see that some two-way traders according to customs data have no positive production in that year according to the firms' census. In Côte d'Ivoire, this is the case of 127 GVC firms (54 pure exporters and 173 pure importers). In Cameroon, 610 GVC firms (147 pure exporters and 5,255 pure importers) are concerned.³ Indeed, there are two categories of two-way traders: i) firms which are active in production and truly involved in a GVC, and ii) wholesalers who are trading back and forth.⁴ Once we apply the filter of positive production and employment, we find 251 GVC firms in Côte d'Ivoire and 291 GVC firms in Cameroon. The bottom half of Figure 1 summarizes the definition of GVC firms in the two countries. Table 1 and Table 2 present the two samples. The unit of observation is a firm-year. There are 4,321 firm-year observations in the Côte d'Ivoire sample and 46,256 observations in the Cameroon sample, out of which GVC firms are 16.8% in Côte d'Ivoire, a figure similar to the estimation of DAVIS and ZAKI (2020) based on WBES, and only 1.9% in Cameroon. The difference between the two countries comes from the difference in sector coverage. While in Côte d'Ivoire, we consider only manufacturing formal firms, Cameroonian data consider the universe of firms registered in the country in any sector. Indeed, the share of GVC firms is higher in manufacturing industries in Cameroon, and similar to Côte d'Ivoire (Figure 2). GVC firms are very rare (less than 2%) in commerce and other services sectors, which account for, respectively, 29% and 63% of registered firms in Cameroon.

Table 1: Côte d'Ivoire, sample characteristics (2013-2016)

	GVC Firms			Non-GVC (exporter or importer)			Domestic Firms		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
Sale ('000 US\$)	726	43,847	186,941	740	2,215	10,686	2,855	291.4	1,557
Skilled Labour	726	78.39	115.8	740	12.7	23.48	2,855	4.653	14.73
Unskilled Labour	726	270.6	688.9	740	26.71	81.71	2,855	6.501	19.03
Labour	726	348.9	763.6	740	39.42	90.58	2,855	11.15	25.25
Asset ('000 US\$)	726	11,811	49,839	740	582	2,400	2,855	76.42	483.4
Investment ('000 US\$)	726	2,638	10,930	740	192.2	760.3	2,855	17.78	152.9
Export ('000 US\$)	726	18,180	133,532	740	133.2	2,389	2,855	0	0
Import ('000 US\$)	726	11,797	51,091	740	598.4	5,496	2,855	0	0
Wage p.c. ('000 US\$)	726	8.117	10.94	740	5.003	8.461	2,855	2.505	4.39
Small firm (labour <10)	726	0.0482	0.214	740	0.382	0.486	2,855	0.739	0.439

Note: Unit is a firm-year observation.

Source: Manufacturing firms' census and customs data.

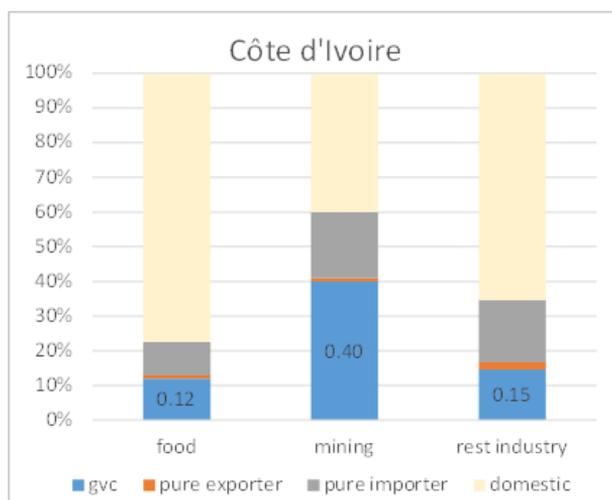
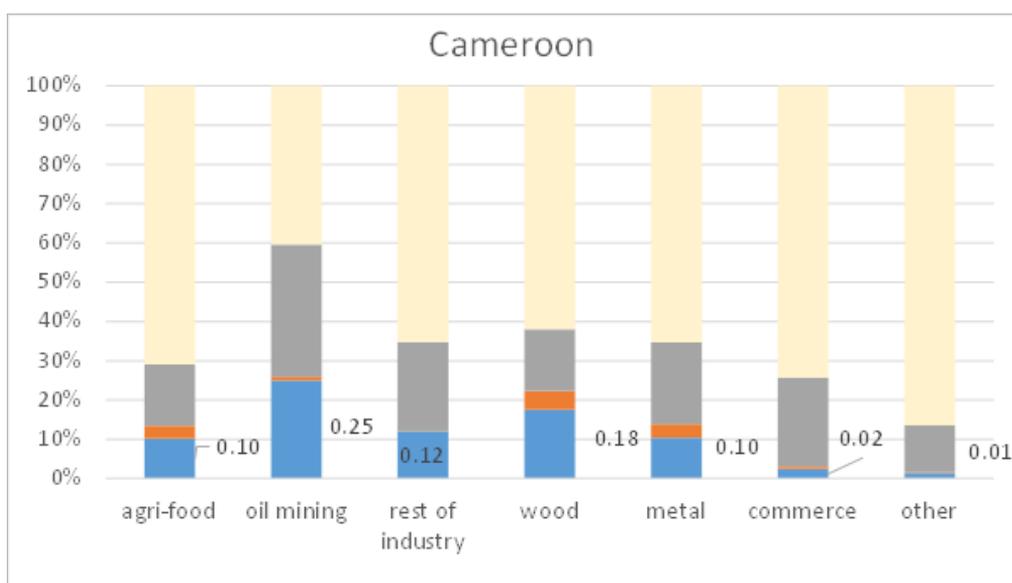
Table 2: Cameroon, sample characteristics (2011-2016)

	GVC Firms			Non-GVC (exporter or importer.)			Domestic Firms		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
Sale ('000\$)	863	45,604	171,163	5,197	3,217	23,333	39,476	469.3	29,186
Labor	863	310.9	1,167	5,197	1,272	89,139	39,476	6.784	60.41
Export ('000\$)	863	6,606	22,906	208	1,451	3,484			
Import ('000\$)	863	10,519	38,269	4,989	601.2	4,143			

Note: Unit is a firm-year observation.

Source: Firms' census and customs data.

Figure 2: Firms by trade status and sector



Notes: Distribution of firms by trade status (GVC firm, pure exporter, pure importer, domestic firm) by sector of activity (all years are pooled). The numbers are the share of GVC firms in the total number of firms of the sector.

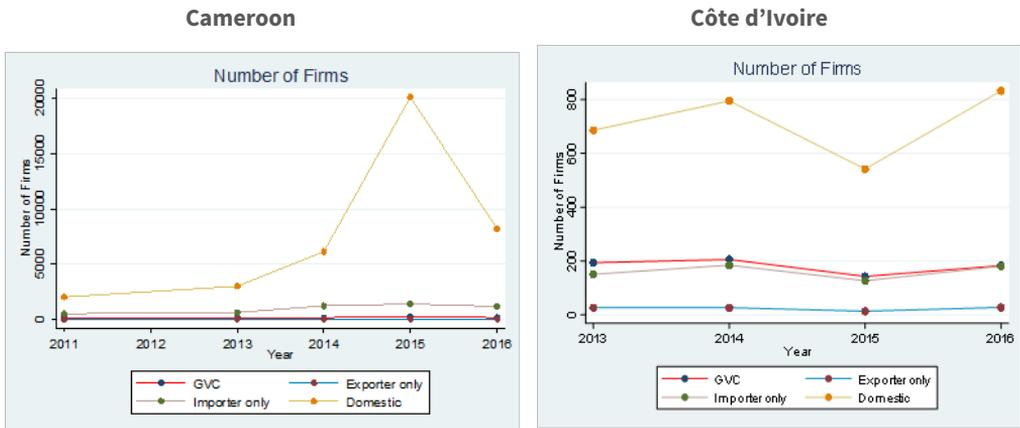
4. Characteristics of GVC firms in Côte d'Ivoire and Cameroon

Importance of GVC firms

In both countries, a small number of firms are active in exports or in GVCs, but there are more GVC firms than “pure exporters”. In Cameroon, 80% of firms in the sample are domestic and about 15% are pure importers while 2% are GVC firms and less than 1% are pure exporters. In Côte d'Ivoire, despite a higher number of firms engaged in trade (with 66% of firms in the manufacturing sector's sample being domestic), there are even more GVC firms than pure exporters compared to Cameroon (17% are GVC firms and 2% are pure exporters).⁵ The dominance of GVC in the total number of exporters does not change over time (no significant trend, even controlling for sectors or restricting to manufacturing industry).

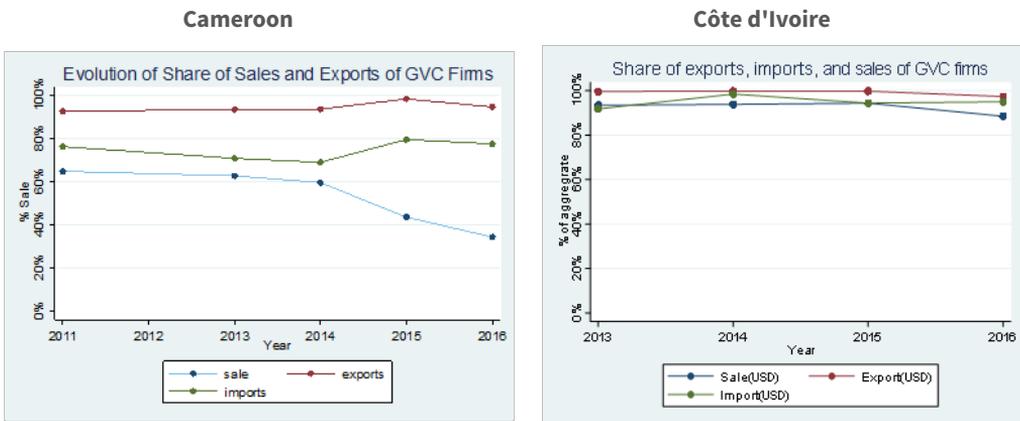
That the number of GVC firms is higher than the number of exporters in both countries is counter-intuitive: we would have expected, on the contrary, that GVC firms, being more “selected” would be fewer than pure exporters. Possible explanations are related to the specificity of firms in developing countries and to the specificity of GVC trade compared to non-GVC trade. In developing countries with weak domestic supply chains, firms need foreign inputs crucially. As a consequence, their primary involvement in trade is through importing inputs. Only once they have secured that requirement can they expand to exports, thus appearing as GVC firms more often than as pure exporters. This is in line with John Sutton's case studies on firms' narratives (enterprise maps) in African countries.⁶ The second explanation relates to the specificity of GVC trade: a firm in a GVC only needs to deliver one part or intermediate product to another member of the supply chain whereas a pure exporter must produce a finished product entirely on her own. Thus, it should be easier to be a GVC firm than a pure exporter. As a consequence, GVC firms hold the lion's share of exports and imports (Figure 3). However, their share in total sales tends to decrease over time, more markedly in Cameroon. In Côte d'Ivoire, the stability of the share of GVCs in aggregate flows (of sales, exports, and imports) hides a decline in values, mostly in 2015–2016, due to the slowdown in domestic economic growth (from 9.37% in 2014 to 7.18% in 2016).

Figure 3: Number of firms by type



Source: Authors' own calculations based on the merged custom and firm-level data.

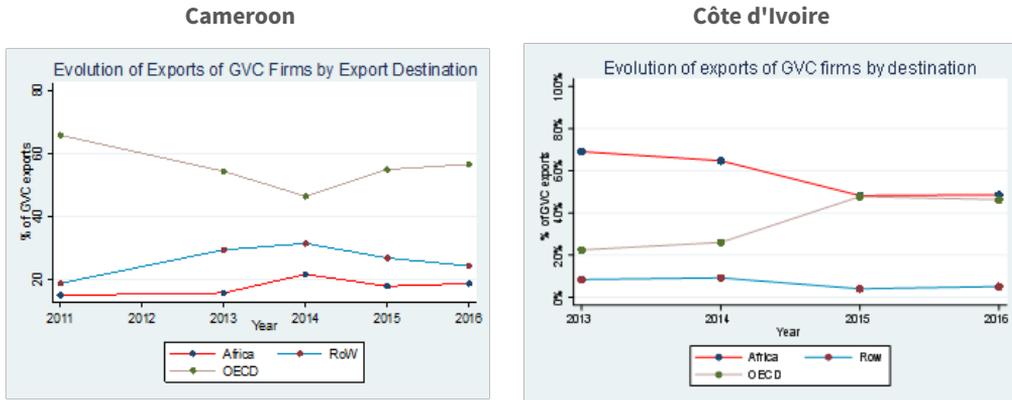
Figure 4: Share of GVC in total sales, exports, and imports



Source: Authors' own calculations based on the merged custom and firm-level data.

Figure 5 shows the main destination of GVC exports, summarized in three groupings: African countries, OECD countries, and the Rest of the World (RoW). We consider main destinations as proxies of the nationality of the “lead firm” in a GVC. In Cameroon, GVCs are mostly oriented towards the OECD but with a slight decrease over time while one-fifth are oriented towards African countries. In Côte d'Ivoire, in 2013, two-thirds of GVCs are oriented towards African countries, but they are caught up by the increasing number of OECD-oriented GVCs.

Figure 5: Main destination of GVCs

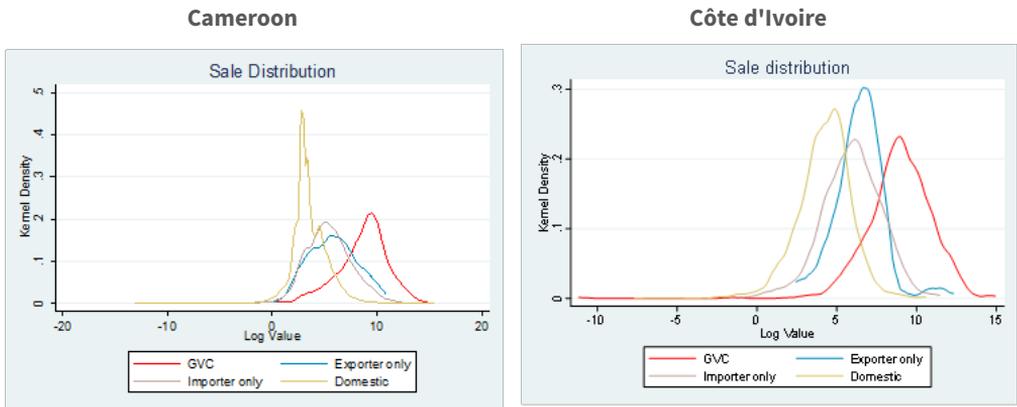


Source: Authors' own calculations based on the firm-level data set that is constructed by merging firm census and custom data.

GVC firms' characteristics and performance

GVC firms are larger than other firms, on average, with larger standard-errors—except total employment in Cameroon—meaning that GVC firms are also more diverse (Tables 1 and Table 2). Figure 6 and Figure 7 draw the whole distribution across firms and years of two variables: total sales (a proxy for size), and the ratio of sales over labour (a proxy for productivity). The figures compare the distribution of each variable for GVC firms, pure exporters, pure importers, and domestic firms. In Cameroon and Côte d'Ivoire, the curve of the distribution of sales of GVC firms is far to the right of the curves of other types of firms, meaning that GVC firms have larger turnover. Yet, there is a significant amount of overlap between GVC firms and exporters and even importers (Figure 6). This is due to the fact that GVC firms are very diverse and not restricted to very large firms. Indeed, it is precisely what we expected from GVCs: a way for smaller firms to access international markets by lowering the cost of entry. Regarding productivity (sales/labour), the curves are very similar for GVC and importing firms, and in Côte d'Ivoire, exporters seem even more similar to domestic firms than to GVC firms (Figure 7). Note that Figure 6 and Figure 7 are drawn at the firm-year level. If joining a GVC would enhance a firm's performance, part of the difference between the curves would be endogenous (in other words, the curves are likely to overstate the productivity premium associated with a GVC).

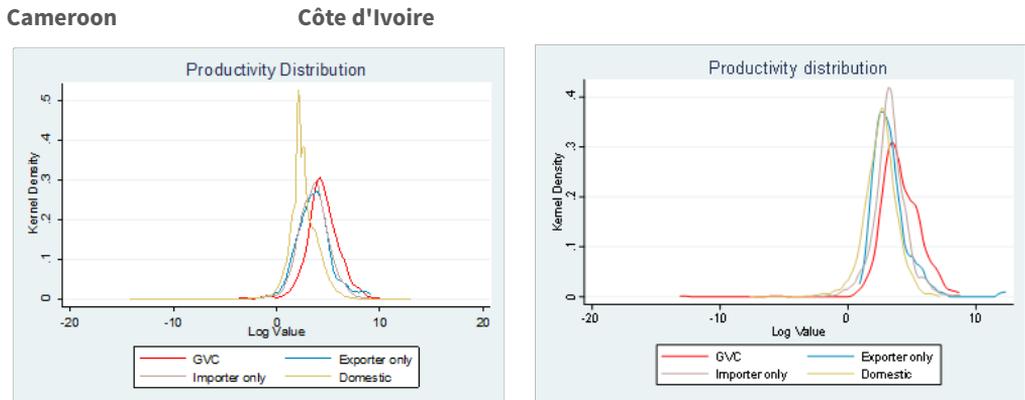
Figure 6: Sale distribution



Note: Values are in log terms.

Sources: Authors' own calculations based on the firm-level data set that is constructed by merging firm census and custom data.

Figure 7: Productivity (sale per labour)



Note: Values are in logarithms.

Source: Authors' own calculation based on the firm-level data set that is constructed by merging firm census and custom data.

5. Dynamics

Not only are GVC firms more productive than other types of firms, they also survive longer. Even in the short time span of our data set, GVC firms are active longer than (in decreasing order) pure exporters, pure importer, and domestic firms (Table 3).

Table 3: Number of years of activity

Cameroon	Côte d'Ivoire
mean #years (2011-16)	mean #years (2013-16)
gvc	3.39
importer-only	2.56
exporter-only	2.77
domestic	1.27
gvc	2.65
importer-only	2.27
exporter-only	2.46
domestic	2.03

Notes: Number of years of activity of firms, by trade status. The computation excludes the first year of the sample. Thus, the maximum number of years is five in Cameroon and three in Côte d'Ivoire.

Mobility between firms' trade status

Transition matrices

How do firms join a GVC? We seek a first answer based on longitudinal statistics. We look at whether a firm changes the type of her involvement in trade. We consider four types of trade status: (i) selling exclusively on the domestic market (a domestic firm), (ii) being a pure importer, (iii) being a pure exporter, or (iv) a GVC firm. We look at firms that are always active and exploit the largest time span available for each country's data set.

Table 4 shows the firms' transition between trade statuses in Côte d'Ivoire in 2013–2016. The number of firms that started out as domestic firms is the largest (162 firms) followed by GVC firms (111 firms) and these two groups are the most persistent: 89.5% of domestic firms and 86.5% of GVC firms keep the same trade status three years later. Thus, it seems that indeed, GVC firms are stable over time, almost as much as domestic firms. Surprisingly, the highest mobility is observed for firms which started out as “pure exporters”: only 41.7% of them are still the same three years later. This

high mobility could be explained by their relatively small number (12 firms), which hints at the difficulty of relying only on exports in Côte d'Ivoire. Pure exporters have a high probability to become GVC firms (25% of them do so, compared to 17.5% for pure importers, and less than 2% for domestic firms).

In Cameroon, over five years (2011–2016), the mobility between trade status is similar (Table 5). GVC status is stable in Cameroon (44% of initial GVC firms remain so), although less than in Côte d'Ivoire (also due to the longer time span). Pure exporters are rare, but their chances at becoming GVC firms are higher (26.7%) than for pure importers (5.4%) and domestic firms (0.6%).

In both countries, the probability of moving to a GVC status is higher for pure exporters than pure importers. Yet, as there are many more firms that import than export (because when domestic firms enter international trade, they start by importing), one-fifth (=13/65) of GVC firms in Cameroon in 2016 used to be “pure importers” five years before and this is also the case for 6% (=7/109) of manufacturing GVC firms in Côte d'Ivoire. Importing is also a fallback option if firms face difficulties in a GVC: 11.7% of GVC firms in Côte d'Ivoire and 23.9% of them in Cameroon are back to import a few years later.

In this paper, we focus on firms that are active continuously and do not study the case of entry and exit. However, many GVC firms are the result of FDIs and are created directly as exporter-importer. We give a first glimpse of this phenomenon in Cameroon and Côte d'Ivoire, by introducing the possibility that a firm is not active in a given year. In order to be sure that a firm is counted only once, we take the case of a fixed window of calendar years in both countries, from 2013 to 2016. The transition matrices in Table A1 (in the appendix) show that 1% of firms that entered after 2013 in Cameroon (and 0.5% in Côte d'Ivoire) are GVC firms in 2016. The odds are tiny but because of the sheer number of new firms (7,856 in Cameroon and 653 in the manufacturing sector in Côte d'Ivoire), they are not negligible. In fact, if we look the other way around, out of the 170 Cameroonian GVC firms in 2016, 72 were already in GVC three years before but a similar number (77) are new. In Côte d'Ivoire, out of the 183 manufacturing GVC firms of 2016, 121 were already GVCs three years before and 40 are new (Table A1 in the appendix). Thus, direct entry into GVCs and their determinants deserve further study.

Table 4: Transition matrix across trade status, Côte d'Ivoire (2013-2016)

	Trade Status (t)				
	Domestic	Pure importers	Pure exporters	GVC firms	Total
Trade Status (t-3)					
<i>Number of firms</i>					
Domestic	145	12	2	3	162
Pure importers	12	20	1	7	40
Pure exporters	3	1	5	3	12
GVC firms	2	13	0	96	111
Total	162	46	8	109	325
<i>Percentage values</i>					
Domestic	89.5	7.4	1.2	1.9	100
Pure importers	30.0	50.0	2.5	17.5	100
Pure exporters	25.0	8.3	41.7	25.0	100
GVC firms	1.8	11.7	0.0	86.5	100
Total	49.85	14.15	2.46	33.54	100

Notes: The upper part of the table shows the number of firms by trade status in 2013 (in rows) and in 2016 (columns). The lower part shows the corresponding percentage values. The sample is restricted to firms that are present in both years. There were 111 GVC firms in 2013 and 109 in 2016, out of the firms which were active in both years. It can be seen that 96 firms which were GVC firms in 2013 (86.5% of GVC firms in the initial year) are still so in 2016, 13 (or 11.7% of the initial GVC firms) have become pure importers in 2016.

Table 5: Transition matrix across trade status, Cameroon (2011-2016)

	Trade Status (t)				
	Non-traders	Importers-only	Exporters-only	GVCs	Total
Trade Status (t-5)					
<i>Number of firms</i>					
Non-traders	607	67	1	4	679
Importers-only	87	139	2	13	241
Exporters-only	6	0	5	4	15
GVCs	8	17	2	44	71
Total	708	223	10	65	1 006
<i>Percentage values</i>					
Non-traders	89.4	9.9	0.1	0.6	100
Importers-only	36.1	57.7	0.8	5.4	100
Exporters-only	40.0	0.0	33.3	26.7	100
GVCs	11.3	23.9	2.8	62.0	100
Total	70.4	22.2	1.0	6.5	100

Notes: There were 65 GVC firms in 2011 and 71 in 2016, out of the firms which were active in both years. It can be seen that 44 firms which were GVC firms in 2011 (62% of GVC firms in the initial year) are still so in 2016, 17 of them (or 23.9% of the initial GVC firms) have become pure importers in 2016.

Econometric analysis

Estimation strategy

We now pool together the data of the two countries and estimate the probability of becoming a GVC firm knowing the firm's trade status at baseline. We consider the same time frame for the two countries and restrict to the period 2013–2016. We regress, with a Linear Probability Model (LPM), the probability of being a GVC firm in 2016 based on trade status in 2013:

$$Y_i = T_i\beta + X_i\theta_i + \delta_i + \gamma_c + \varepsilon_i \quad (1)$$

Where: Y_i is the firm-level outcome of interest, a dummy variable indicating whether firm i is engaged in a global value chain in 2016. T_i is the firm trade status in 2013, our key explanatory variable: a set of dummy variables indicating whether a firm is pure importer, pure exporter, or a two-way trader in 2013. The (omitted) reference group is the domestic firms. The coefficient of interest, β , measures the additional probability of becoming/staying a GVC firm in $year_t$ (2016) for firms that were either pure importers, pure exporters or GVC firms in $year_{t-3}$ (2013), relative to the case of domestic firms. Industry (δ_i) and country fixed effects (γ_c) stand, respectively, for industry time invariant characteristics (for seven sectors: food, wood, mining, metals, rest of industry, commerce, rest of the economy), and for country's business environment or policy shocks. We also control for firms' characteristics, X_i , such as size (labour and sale) and the level of wages, all in 2013. The error term, ε_i , is clustered at country and industry level, so as to take into account the correlation across firms within each country and industry.

The sample used for the estimation includes 1,223 and 325 unique firms for Cameroon and Côte d'Ivoire, both present in 2013 and 2016. We neglect the case of firms that enter directly as GVC firms. Ideally, Equation 1 could be estimated in a panel that would include all observations between the initial and final year, so as to investigate whether a change of trade status is permanent or fluctuates annually, controlling for firms' unobservable characteristics with a fixed effect. We leave this question for further study and compare here the initial and final year of a three years window. In addition, we estimate a probit and logit and run the model for each country separately (see Table A2 in the appendix).

Results

Baseline regression results are reported in Table 6. In column (1), no other variables are controlled for. In column (2), firms' characteristics—labour, sale, and wages—are included; and in column (3), industry and country fixed effects are added to the rest. Our preferred specification, column (3), confirms the main finding from the transition matrices in Table 4 and Table 5. The probability of moving into a GVC is higher for

pure exporters than pure importers. Being a pure exporter in the baseline year (2013) increases a firm's probability of moving to GVC status three years later by 20% relative to domestic firms. On the other hand, being a pure importer increases the chance of moving to a GVC status three years later by only 4% compared to a domestic firm. Our main findings are robust to alternative specifications (see Table A2 in the appendix). Using both a probit and logit model, we find that the probability of moving to GVC status is higher for pure exporters. The result holds when we run the specification for each country separately, with the same ranking, although the coefficients are not statistically significant for Côte d'Ivoire alone, perhaps due to the small size of the sample.

Table 6: Transition to a GVC firm depending on initial trade status: Estimation

	To GVC (2016)	To GVC (2016)	To GVC (2016)
	(1)	(2)	(3)
Trade Status (2013)			
GVC	0.823***	0.738***	0.699***
	(0.0284)	(0.0372)	(0.0401)
Pure exporters	0.282***	0.240**	0.200**
	(0.0987)	(0.0964)	(0.0986)
Pure Importers	0.0767***	0.0487***	0.0396**
	(0.0188)	(0.0171)	(0.0159)
Observations	1,548	1,518	1,518
Control	No	Yes	Yes
Industry FE	No	No	Yes
Country FE	No	No	Yes
Prob>F	0.0000	0.0000	0.0000

Note: Linear probability model. The dependent variable is a dummy for being a GVC firm in 2016. The reference group for the trade status in 2013 is domestic firms. Control variables include (log) sales, labour, and wages. Robust standard errors are in parentheses (clustered at the country-industry level). *** p<0.01, ** p<0.05, * p<0.1

Mobility between GVCs

We now focus on continuing GVC firms.⁷ We distinguish between three types of GVCs defined with respect to the main destination of their exports. We define as (i) “African GVC”, a firm whose exports are exclusively sold in another African country; (ii) “OECD GVC”, a firm whose main exports' destinations are in the OECD; and (iii) “RoW GVC”, a firm whose main exports are neither in an African country nor in the OECD.

In Côte d'Ivoire, GVC firms are either oriented towards African countries or towards OECD countries. Few of them have countries in the Rest of the World as their main destinations. One-third of GVC firms initially oriented towards African countries access

OECD countries three years later; while one-fifth of GVC firms oriented towards the OECD have African countries as their main destination three years later (Table 6).

In Cameroon, there is less mobility across the three countries groupings (Table 7). GVC firms oriented towards African countries and those oriented towards OECD countries are segmented. Only 3% of African-oriented GVC firms in 2011 switched their main destination to the OECD region in 2016. There is more mobility from RoW-oriented GVC firms to OECD countries, but they are very few to start with.

The difference in the mobility matrix between the two countries needs to be explored further. It may come from different sectoral specialization or different trade policies in the two countries, or different macroeconomic environments. The diversity shows that there is no pre-determined evolution between the types of destination markets.

Table 7: Transition matrix of GVC firms across export markets: Côte d'Ivoire (2013-2016)

	Export Destination (t)			
	Africa	Rest of the World	OECD	Total
Export destination (t-3)				
<i>Number of firms</i>				
Africa	21	0	9	30
Rest of the World	3	0	1	4
OECD Countries	11	1	42	54
Total	35	1	52	88
Percentage values				
Africa	70.0	0.0	30.0	100
Rest of the World	75.0	0.0	25.0	100
OECD Countries	20.4	1.9	77.8	100
Total	39.77	1.14	59.09	100

Note: The upper part of the table shows the number of GVC firms by main export destination in 2013 (in rows) and in 2016 (columns). The lower part shows the corresponding percentage values.

Table 8: Transition matrix of GVC firms across export markets: Cameroon

		Export destination (t)			
		Africa	Rest of the World	OECD	Total
Export destination (t-5)					
<i>Number of firms</i>					
Africa		31	0	1	32
Rest of the World		0	1	2	3
OECD Countries		0	0	9	9
Total		31	1	12	44
<i>Percentage values</i>					
Africa		96.9	0.0	3.1	100
Rest of the World		0.0	33.3	66.7	100
OECD Countries		0.0	0.0	100.0	100
Total		70.5	2.3	27.3	100

Note: The upper part of the table shows the number of GVC firms by main export destination in 2011 (in rows) and in 2016 (columns). The lower part shows the corresponding percentage values.

6. Conclusion

In this paper, we examine GVC firms in Cameroon and Côte d'Ivoire based on a novel data set that results from the matching of firm census and customs transactions at the firm-level. Our study complements existing work on GVC firms in African countries; it aims at covering the entire universe of firms and follows them over many years, allowing the studying their evolution. We show that GVC firms are in small numbers, but more frequent than pure exporters in the two countries we study. GVC firms are larger and more efficient, on average, than other firms, but they are also more diverse. As a result, the distribution of GVC firms overlaps with those of exporters and importers for characteristics such as size and those of importers for productivity. We also find that GVC firms' survival rate is higher than other firms. On mobility, we find no clear pattern on the evolution of GVCs main destination: while there is some mobility in Côte d'Ivoire, between GVCs oriented towards African countries and those oriented towards OECD countries, there is more segmentation and inertia in Cameroon. As for mobility between trade statuses, it is easier to enter a GVC when the firm is initially an exporter rather than an importer. This hints to different degree of access to trade through importing and exporting, that deserves further scrutiny.

Notes

1. Statistics computed are for 2020 and data used come from <https://www.trademap.org/Index.aspx>
2. Our definition differs from another one which would consider as participating in a GVC firms which are multinational. In the firms' surveys, these firms can be identified as firms with a foreign ownership. Actually, defining GVC firms through the multinational dimension of their activity makes sense for the leading firm in a GVC, the one which organizes the value chain, but less so for a firm which receives orders from the lead firm and just takes part in the chain, often with domestic capital. Indeed, foreign ownership (which we know only for Côte d'Ivoire firms) does not completely match with our definition of a GVC firm as a two-way trader with positive production.
3. The number of firms active in customs with no domestic production is higher in the Cameroonian data because they encompass all sectors, while Côte d'Ivoire firms' data are only on the manufacturing sector.
4. Another way to control for pure traders would have been to drop firms with many different products exported (for example, more than 25).
5. The difference between the two countries might come from the fact that Côte d'Ivoire's sample is specific to the manufacturing sector.
6. <https://personal.lse.ac.uk/sutton/>
7. As seen in the previous sub-section, GVC firms can also transition to a non-GVC status (and either exit, become domestic, pure importer, or pure exporter).

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Appendix

Table A1: Transition matrices into a GVC with firms' entry and exit: 2013-2016

(a) Cameroon

	Trade Status (2016)					Total
	Not active	Non-traders	Importers-only	Exporters-only	GVCs	
<i>Number of firms</i>						
Not active		6903	843	33	77	7856
Non-traders	1711	1186	120	4	2	3023
Importers-only	320	109	197	1	15	642
Exporters-only	19	3	0	6	4	32
GVCs	49	1	17	3	72	142
Total	2099	8202	1177	47	170	11695
<i>Percentage values</i>						
Not active		87.9	10.7	0.4	1.0	100
Non-traders	56.6	39.2	4.0	0.1	0.1	100
Importers-only	49.8	17.0	30.7	0.2	2.3	100
Exporters-only	59.4	9.4	0.0	18.8	12.5	100
GVCs	34.5	0.7	12.0	2.1	50.7	100
Total	17.9	70.1	10.1	0.4	1.5	100

continued next page

Table A1 Continued

Côte d'Ivoire

	Trade Status (2016)					Total
	Not active	Non-traders	Importers-only	Exporters-only	GVCs	
Trade Status (2013)						
<i>Number of firms</i>						
Not active		522	82	9	40	653
Non-traders	367	282	25	7	5	686
Importers-only	67	19	50	1	14	151
Exporters-only	8	4	3	9	3	27
GVCs	45	5	21	2	121	194
Total	487	832	181	28	183	1711
<i>Percentage values</i>						
Not active		79.9	12.6	1.4	6.1	100
Non-traders	41.1	41.1	3.6	1.0	0.7	100
Importers-only	12.6	12.6	33.1	0.7	9.3	100
Exporters-only	14.8	14.8	11.1	33.3	11.1	100
GVCs	2.6	2.6	10.8	1.0	62.4	100
Total	48.6	48.6	10.6	1.6	10.7	100

Table A2: Effect of trade status in 2013 on the probability of transitioning to a GVC firm in 2016

	To GVC (2016)	To GVC (2016)	To GVC (2016)	To GVC (2016)
	(Logit)	(Probit)	(CAM)	(CI)
Trade Status (2013)				
GVC	4.644*** (0.744)	2.376*** (0.300)	0.669*** (0.0621)	0.572*** (0.0799)
Pure exporters	2.755*** (0.852)	1.325*** (0.424)	0.265* (0.156)	0.105 (0.121)
Pure Importers	2.039*** (0.627)	0.800*** (0.245)	0.0353** (0.0144)	0.0390 (0.0574)
Observations	1,548	1,518	1,223	325
Control	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Prob>chi2/F	0.0000	0.0000	0.0000	0.0000

Notes: The dependent variable is a dummy equal to 1 if GVC firm in 2016. The comparison group is domestic firms. Control variables include (log) sales, labour, and wages. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1



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