

## Foreign Direct Investments, Financial Development, and Global Value Chains in Sub-Saharan Africa

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### Abstract

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This article analyzes the effects of financial development and Foreign Direct Investment (FDI) on participation in Global Value Chains (GVCs) on the one hand, and examines the specific effects on different components of the Global Value Chains on the other hand, for 34 Sub-Saharan African countries. Using a GMM modeling approach on data from UNCTAD (Eora) and the World Bank (WDI) covering the period 1996-2018, we estimate these different relationships. Our results indicate a negative and significant effect of FDI on Global Value Chains and their components. Financial development, on the other hand, shows a positive and significant effect. These findings suggest that FDI tends to deteriorate participation in value chains due to the lack of technology and knowledge transfer contained in FDI. For financial development, our results indicate that an increase in loans to households, accompanied by a rise in the money supply, represents a major asset for participation in the value chain.

**Keywords:** Financial Development, Foreign Direct Investment, Value Chain, GMM.

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### Introduction

The Global Value Chains (GVC) refers to the process of value-added creation and its cross-border distribution. It encompasses various processes, ranging from the acquisition of raw materials to the delivery of finished products to consumers. A GVC includes activities such as ideation, design, marketing, and after-sales services. The concept of the Global Value Chains refers to the international division of production into activities and tasks performed across different countries. It can be considered as a large-scale extension of the international division of labor originally proposed by Adam Smith. A GVC can be broken down into several components: indirect value-added, domestic value-added, foreign value-added, and export value-added.

Participation in the Global Value Chains reflects a country or region's contribution to the creation and diffusion of global value-added (wealth). Early studies on value chains led to the development of the "smile curve" in the 1990s, which graphically represents the creation of value-added at various stages of the production process. This curve shows that value-added creation is not evenly distributed along the value chain: high value-added activities are concentrated at the upstream stages of production (research and development, design) and at the downstream stages (marketing and distribution of products).

The issue of low participation in the Global Value Chains by developing countries is a major concern for policymakers and researchers in Africa. This concern arises because African countries are among the world's largest exporters of raw materials, yet remain some of the poorest nations on the planet. This phenomenon can be attributed to exports of low value-added products. To address this gap, Sub-Saharan African countries attract Foreign Direct Investment (FDI), which involves an investor from one country (the home country) acquiring assets in another country (the host country). FDI can take three forms: capital participation (mergers, acquisitions, establishment of

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new facilities), reinvestment of profits from an overseas subsidiary, or short- or long-term loans between the parent company and its subsidiary.

Discussions on Global Value Chains and Foreign Direct Investment are grounded in endogenous growth theories. Empirical studies on value chains draw on the work of Rodrik (2018), who argues that value chains are mechanisms for the diffusion of new technologies from developed to developing countries. In this regard, De Marchi & al. (2018) analyze participation in Global Value Chains as a key alternative for promoting innovation and knowledge transfer. This view is shared by Reddy & al. (2020). These knowledge transfers lead to the introduction of new products and processes (Gereffi & al., 2005), with the consequence of improving firms' productivity. Therefore, acquiring new knowledge requires both financial resources and the capacity of governments to attract foreign investments to their countries. This second priority is addressed by Okah & al. (2021), who examine the relationship between Foreign Direct Investment and participation in the Global Value Chains. Their findings show that FDI positively influences the participation of developing countries in the GVC.

While these studies identify key determinants of participation in the GVC, they struggle to precisely define the effect of financial development on participation in the Global Value Chains. Financial development remains, according to studies by Levine & al. (1998; 2000) and Pinshi & Kabeya (2020), a driver of economic growth. This assertion is based on the fact that the acquisition of production factors requires substantial financial availability. Financial development is therefore seen as a legitimate indicator for accessing technologies and attracting FDI.

In this article, we empirically analyze the effects of financial development and FDI on participation in the Global Value Chains within an African context. The necessity of this study arises on two levels. First, there is a noticeable disparity in the level of financial development in Sub-Saharan African (SSA) countries compared to other regions. Indeed, according to the World Bank report (2023), the amount of money in circulation as a percentage of GDP is 40.4% in Sub-Saharan Africa, 83.4% in the Middle East and North Africa, 77.1% in South Asia, 70.8% in Latin America and the Caribbean, 100.4% in North America, and 215.1% in East Asia and the Pacific. Second, it is evident that companies in Sub-Saharan Africa typically operate in the primary sector, with their activities and FDI focused on the extraction and export of raw materials.

The issue addressed in this article concerns the low participation index in Global Value Chains in SSA countries, despite attracting FDI. The article explores whether financial development improves the effect of FDI on SSA countries' participation in the GVC, and also examines its impact on the components of the GVC. The objectives are twofold: first, to determine the effect of financial development and FDI on the GVC, and second, to assess their impact on the components of the GVC. The methodology applies a growth model to maintain consistency with the theoretical literature.

The structure of the article is as follows: after a literature review (Section 2), we present the methodology (Section 3), followed by the results and their interpretation (Section 4), and we conclude (Section 5).

## **2. Literature Review**

### **2.1. Endogenous Growth as the Foundation of Global Value Chains**

The term "endogenous growth theories" refers to the analytical framework developed in the mid-1980s, centered around two foundational papers by P. Romer (1986): *Increasing Returns and Long-Run Growth*, *Journal of Political Economy*, Vol. 94, No.5, pp. 1002-1037, and R. Lucas (1988): *On the Mechanics of Economic Development*, *Journal of Monetary Economics*, Vol. 22, No.1, pp.3-42. While maintaining a neoclassical analytical framework, endogenous growth theories respond to the limitations of the Solow model, which attributes most of growth to exogenous technological progress and concludes that economies will necessarily converge. The new growth theories aim to demonstrate that growth is a self-sustaining phenomenon driven by the behavior of economic agents who accumulate physical capital, technology, human capital, and public capital.

Romer's (1986) model renewed the analysis of investment as a factor in growth based on externalities between firms. By investing in new equipment, a firm not only increases its own production but also enhances that of other firms, whether competitors or not. Investment in new technologies thus becomes the starting point for new learning through practice: improving existing equipment, engineering work (organizing existing techniques), increasing worker skills, etc. However, the firm that generates this knowledge does not fully appropriate it. Consequently, this knowledge inevitably diffuses to other firms.

Research and development investments have a dual effect: they lead to new goods and services protected by patents, which generate revenue for the innovators, and they also produce ideas that serve as a foundation for subsequent innovations and positive externalities. These ideas are, in fact, public goods, open-access resources that allow firms other than the original innovator to advance technology. The accumulation of new knowledge, stemming from existing knowledge and research, drives technological progress, and thus productivity.

## **2.2. Financial Development and Participation in Global Value Chains**

The relationship between financial development and countries' participation in value chains has been the subject of several studies. Indeed, in a panel covering 36 African countries from 2000 to 2018, Okah & al. (2020) examine the contribution of financial development to the participation of African countries in Global Value Chains (GVCs). Their results reveal that financial development increases African countries' participation in GVCs. However, some dimensions of financial development have no positive effect. Moreover, regional characteristics are crucial in understanding the relationship between financial development and export value-added. Similarly, Xu & al. (2024) conduct a study on a sample of 32 countries over the period from 1995 to 2018. Using a general equilibrium model, they assert that financial development promotes product quality by increasing investment intensity in research and development, which ultimately positively impacts the Global Value Chains. The non-linear nature of this relationship is not overlooked. This is presented by Zeng & al. (2022), who perform a study on a sample of 92 countries. They observe that the effect is positive but becomes negative beyond a certain threshold. For them, the development of a financial system should be managed to benefit the national economy; otherwise, the benefits would be directed abroad via foreign direct investment (FDI). Due to the direct or indirect nature of financial development, Shaoqing (2013) proposes to analyze the effect of financial system development on GVCs by approximating the latter to trade value chains. His results first indicate a negative effect of indirect financing on the division of labor, negatively affecting participation in GVCs. Secondly, a positive effect of direct finance on the international division of labor leads to an improvement in the division of labor.

## **2.3. Foreign Direct Investment and Participation in Global Value Chains**

The relationship between foreign direct investment (FDI) and participation in the Global Value Chains remains an important area of research for institutions and economists. Several studies have been conducted by institutions such as the World Bank and by researchers like Aitken & Harrison (1999), Lu & al. (2017), and Martínez & al. (2019). For years, governments have been convinced that FDI creates jobs, boosts productivity, and increases wages (World Bank, 2020). At the same time, existing literature reveals the effects of FDI on participation in Global Value Chains. In this context, Okah & al. (2022), using a dynamic panel model and data from 43 developing countries over the period 2010-2019, show that FDI has a positive and significant effect on the participation of developing countries in GVCs. Contributing to this debate, Huy & Quang (2022) explore the link between FDI and other factors of participation in GVCs in Vietnam over the period 2000-2019. Their results also show that incoming FDI has a positive impact on the country's participation in GVCs, both in the short and long term. For these authors, the economic size and market development of Vietnam and its trade partners are the main determinants of Vietnam's participation in Global Value Chains. On the other hand, Adarov & Stehrer (2021) conduct a study for a sample of European countries covering the period from 2000 to 2014. They empirically assess the impact of FDI as well as the dynamics and structure of capital on the formation of Global Value Chains (GVCs) at the national and sectoral levels. These authors claim that FDI and capital accumulation have a strong impact on participation in GVCs. For them, incoming FDI is particularly conducive to forming upstream links with GVCs, while outgoing FDI facilitates downstream participation in GVCs, particularly in high-tech manufacturing sectors. However, a particularly significant positive impact of FDI and capital accumulation on GVC integration is identified in the textile and apparel industry. Buelens & Tírpák (2017) also focus on how foreign direct investments shape countries' participation in Global Value Chains. To this end, they use a gravity model and find a positive association between the stock of bilateral FDI and bilateral trade as well as the import content of bilateral exports. Given that the stock of bilateral FDI affects both the volume and composition of trade flows, these authors conclude that foreign investors play an active role in shaping the export structure of host economies and their participation in international production networks. Li & al. (2019), using panel data from 2005 to 2016 for 63 countries and the Generalized Least Squares method, study the effects of FDI on the Global Value Chains. Their results show that foreign direct investment has a positive impact on participation in the Global Value Chains and on the export value added of the studied economies.

### 3. Data and Methodology

This study uses annual data from 34 Sub-Saharan African countries covering the period from 1996 to 2018. The choice of the sample and the study period is driven by the unavailability of data for certain countries. We use data from the World Bank, Worldwide Development Indicators (WDI), and UNCTAD.

Following Arellano & Bover (1995) and Blundell & Bond (1998), we have opted for a dynamic panel model using the System Generalized Method of Moments (sys-GMM) estimator in its two-step version due to its ability to capture the dynamic nature of the phenomena under study. This approach is applied in this paper.

The empirical form of our model is as follows:

$$LnCvg_{it} = \alpha_0 + \alpha_1 Ipc_{it} + \alpha_2 Fdi_{it} + \alpha_3 LnFtr_{it} + \alpha_4 Exp_{it} + \alpha_5 Devfin_{it} + \alpha_6 Bmo_{it} + \alpha_7 LnCvg_{it-1} + \gamma_{it} + \mu_{it}$$

With  $i=1,\dots,34$  et  $t=1,\dots, 23$ . Where  $i$  and  $t$  represent respectively the country and time, with these variables defined in Table 1.

**Table 1: Summary of the Variables Used**

Variables	Description of Variables	Expected Signs	Sources
Cvg	Index of participation in Global Value Chains for country $i$ : $Cvg = Vae + Vai$ .		UNCTAD-Eora
Vai	Indirect Value Added. This represents the domestic value added (of country $i$ ) incorporated into the exports of other countries.		UNCTAD-Eora
Vad	Domestic or National Value Added. This is the value added of country $i$ incorporated into its own exports.		UNCTAD-Eora
Vae	Foreign Value Added. This refers to the sum of value added from other countries incorporated into the exports of country $i$ .		UNCTAD-Eora
Vaexp	Value Added to Exports. This is the total value added incorporated into the exports of country $i$ . $Vaexp = Vad + Vae$ .		UNCTAD-Eora
Ipc	Consumer Price Index	-	WDI
FDI	Net Foreign Direct Investment (% of GDP)	+	WDI
Ftr	Labor Force Participation Rate, total (% of the population aged 15 to 64)	+	WDI
Exp	Exports of Goods and Services	+	WDI
Devfin	Domestic Credit to the Private Sector (% of GDP)	+	WDI
Bmo	Broad Money (M3 as a % of GDP)	+	WDI

Source: Authors.

The descriptive statistics of this study provide relevant information on the central tendency and dispersion characteristics of the variables used. Some general insights can be drawn from the reading of Table 2.

• The average  $Ipc$  (16.469) is barely supported by financial development indicators. Indeed, the volume of credit extended to private agents (with an average  $Devfin$  of 18.7% of GDP) remains low for wealth creation, forcing financed projects to generate “excessively” high internal returns to match inflation levels. Moreover, the broad money supply (average  $Bmo = 27.4\%$  of GDP) remains low, reflecting a restrictive monetary policy and a low inflation target. Unfortunately, the general price level remains relatively high. This suggests that while monetary policy is restrictive for credit, it does not provide the expected benefits in terms of controlling inflation.

Table 2: Descriptive statistics

Variables	Obs	Mean	std	Min	Max
Cvg	782	2100397.8	7824982.1	0	67532260
Vai	782	1522934.1	5488406.4	0	46053610
Vad	782	3458533.8	11548933	0	94407100
Vae	782	577463.74	2385440.2	0	21478650
Vaexp	782	4035997.7	13848971	0	1.159e+08
Ipc	782	16.469	52.169	-16.86	414.106
FDI	782	3.389	4.99	-10.038	40.167
Ftr	782	67.856	10.331	42.128	89.45
Exp	782	7.578e+09	1.779e+10	28631495	1.269e+11
Devfin	782	18.797	22.844	0.002	142.422
Bmo	782	27.403	18.889	2.857	151.549

Source: Authors, based on data from WDI and UNCTAD-EORA.

- The average level of FDI (3.39% of GDP) remains very low in terms of wealth creation.
- The labor force is moderately utilized (the percentage of people aged 15-64 in the workforce is 67.86%).
- The decomposition of the Global Value Chains (Cvg) into indirect value added (Vai), domestic value added (Vad), foreign value added (Vae), and value added to exports (Vaexp) reveals very high standard deviations between the minimum and maximum values. This should allow for an increase in foreign direct investment, made possible by financial development mechanisms. Thus, financial development could serve as a channel for the expansion of FDI and value creation in the countries under study.

Table 3 shows weak correlation coefficients for all variables except for the internal correlations of value added. These internal correlations in the context of this study do not pose a problem, as these variables appear endogenously in the different specifications. The VIF test is presented in the appendix.

Table 3: Correlation Matrix

Variables	(Cvg)	(Vai)	(Vad)	(Vae)	(Vaexp)	(Ipc)	( FDI )	( Ftr )	( Exp )	(Devfin)	(Bmo)
Cvg	1.000										
Vai	0.996*	1.000									
	(0.000)										
Vad	0.990*	0.997*	1.000								
	(0.000)	(0.000)									
Vae	0.985*	0.971*	0.957*	1.000							
	(0.000)	(0.000)	(0.000)								
Vaexp	0.995*	0.998*	0.999*	0.970*	1.000						
	(0.000)	(0.000)	(0.000)	(0.000)							
Ipc	-0.011	-0.010	-0.009	-0.010	-0.010	1.000					

	(0.763)	(0.781)	(0.794)	(0.780)	(0.790)						
FDI	-0.083*	-0.096*	-0.106*	-0.077*	-0.101*	0.016	1.000				
	(0.021)	(0.007)	(0.003)	(0.031)	(0.005)	(0.653)					
Ftr	-0.106*	-0.106*	-0.102*	-0.106*	-0.104*	0.058	-0.027	1.000			
	(0.003)	(0.003)	(0.004)	(0.003)	(0.004)	(0.105)	(0.444)				
Exp	0.890*	0.915*	0.929*	0.816*	0.915*	-0.007	-0.096*	-0.092*	1.000		
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.849)	(0.007)	(0.010)			
Devfin	0.688*	0.665*	0.662*	0.725*	0.677*	-0.051	-0.051	-0.175*	0.541*	1.000	
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.154)	(0.156)	(0.000)	(0.000)		
Bmo	0.145*	0.177*	0.193*	0.075*	0.174*	-0.026	-0.043	0.067	0.304*	-0.048	1.000
	(0.000)	(0.000)	(0.000)	(0.036)	(0.000)	(0.475)	(0.235)	(0.061)	(0.000)	(0.176)	

#### 4. Results

Table 4 presents the econometric results for specification 1 of our model (participation in Global Value Chains) as well as specifications 2 to 5, which relate to the components of the Global Value Chains. The primary explanatory variable is FDI, and the control variables include financial development, the consumer price index, the labor force, and exports.

Table 4: Results of the Econometric Estimations

	(1)	(2)	(3)	(4)	(5)
Variables	LnCvg	LnVad	LnVae	LnVai	LnVaexp
L.	1,002*** (0,000)	1,005*** (0,000)	1,003*** (0,000)	1,001*** (0,000)	1,001*** (0,000)
Ipc	-0,001* (0,07)	0,002 (0,72)	-0,002*** (0,001)	-0,00009 (0,81)	-0,0004 (0,54)
<b>FDI</b>	<b>-0,013***</b> <b>(0,004)</b>	<b>-0,014***</b> <b>(0,001)</b>	-0,001 (0,726)	<b>-0,009***</b> <b>(0,001)</b>	<b>-0,012***</b> <b>(0,000)</b>
LnFtr	-0,032 (0, 876)	0,132 (0,792)	0,591 (0,286)	-0,123 (0,808)	0,027 (0,951)
LnExp	0,027*** (0,002)	0,012 (0,224)	-0,007 (0,688)	0,002 (0,821)	0,013 (0,141)
<b>Devfin</b>	<b>0,002**</b> <b>(0,036)</b>	0,002 (0,109)	0,002 (0,12)	<b>0,002***</b> <b>(0,003)</b>	<b>0,002*</b> <b>(0,074)</b>
<b>Bmo</b>	<b>1,436***</b> <b>(0,000)</b>	<b>1,077***</b> <b>(0,000)</b>	<b>0,823***</b> <b>(0,000)</b>	<b>0,928***</b> <b>(0,000)</b>	<b>1,15***</b> <b>(0,000)</b>
Constant	-0,521 (0,558)	-0,873 (0,702)	-2,387 (0,36)	0,461 (0,843)	-0,437 (0,826)
Observations	748	748	748	748	748
Number of Countries	34	34	34	34	34

Number of Instruments	86	86	86	86	86
Test AR1 p-value	0,000	0,000	0,000	0,000	0,000
Test AR2 p-value	0,335	0,956	0,111	0,633	0,635
Test de Sargan p-value	0,000	0,000	0,000	0,000	0,000
Test de Hansen p-value	1,000	1,000	1,000	1,000	1,000
Diff-Hansen	1,000	1,000	1,000	1,000	1,000

**Note :** (1), (2), (3), (4) et (5) are the different specifications of the estimated model. The values in parentheses are the p-values. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

#### • Results Relating to Financial Development:

One of the indicators of financial development - credit granted to the private sector (Devfin) - significantly and positively explains Global Value Chains (Cvg), indirect value added (Vai), and value added to exports (Vaexp). This result has strong implications for economic policy.

It suggests the presence of risk in domestic value added (Vad) and foreign value added (Vae), with the effect of private sector credit (Devfin) being non-significant for these variables, while it is significant for export value added (Vaexp), where  $Vaexp = Vad + Vae$ . The significant and positive effect of Devfin on Vaexp indicates that a mechanism for diversifying export value added is a relevant solution to the aforementioned risks.

Similarly, the significant effect of private credit to the economy (Devfin) on Global Value Chains (Cvg) also indicates that a mechanism for diversifying the contribution to Global Value Chains is possible to reduce the level of risk on foreign value added.

This result calls for policy directions focused on foreign value added.

The other financial development indicator considered in this study - broad money supply (Bmo) - has positive effects on participation in Global Value Chains (Cvg) and all its components. This result encourages efforts aimed at expanding monetary policy.

#### • Results Related to FDI Flows:

Net FDI flows have a significant negative effect on participation in Global Value Chains (Cvg) and its components, with the exception of foreign value added (Vae). This counterintuitive relationship suggests the presence of a crowding-out effect on value added induced by FDI. As net FDI flows increase, value added diminishes. For value added to grow, net FDI flows must contract.

To understand the effect of FDI on participation in Global Value Chains and its components, we analyze various relationships involving FDI, the labor force (Ftr), and exports.

The effect of FDI on foreign value added (Vae) is non-significant. This reveals that FDI does not have a significant impact on the value added of foreign firms in the economies of the African countries involved in this study.

When FDI flows are significant, they are negative - particularly for participation in Global Value Chains (Cvg) and for export value added (Vaexp). This reinforces the idea that FDI flows have a crowding-out effect on value added. A more detailed examination of the effect of FDI on Global Value Chains (Cvg) and on export value added (Vaexp) shows that the significance of the effects of FDI on Cvg and Vaexp is achieved through a diversification mechanism. This mechanism implies significant risks for foreign value added.

The effect of the labor force (Ftr) on participation in Global Value Chains (Cvg) is non-significant, as well as on the components of Cvg. This indicates that the labor force is directed towards sectors that do not create value added.

The effect of exports (Exp) on participation in Global Value Chains (Cvg) is significant and positive but non-significant for the components of Cvg. It is a diversification mechanism that leads exports to contribute significantly to Global Value Chains. This diversification mechanism suggests the presence of risks related to foreign value added (Vae) and indirect value added (Vai).

## Conclusion

The aim of this study was to understand and analyze the effects of net FDI flows and financial development on participation in Global Value Chains, and to examine the specific effects on the various components of value creation. The main findings regarding financial development indicate that private credit to the economy has a positive relationship with value creation, provided there is a mechanism of diversification within the value creation process. This potential must be supported by an expansionary monetary policy. Regarding net FDI flows, the key results of this study suggest that FDI contributes to redirecting value creation mechanisms, notably the labor force, towards sectors that do not create value. This diversion of the labor force results in the crowding-out of high value-added activities (such as engineering, IT, and services) in favor of low- or no-value-added activities (such as mining and agriculture), which in turn reduces the level of value added.

Ultimately, we conclude that Sub-Saharan African countries should focus on attracting high value-added FDI, meaning FDI that leads to better knowledge transmission. Moreover, monetary authorities should work toward implementing an expansionary monetary policy while managing inflation, which could otherwise have negative effects on participation in Global Value Chains.

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## Appendix

**Table 5: VIF Test**

	VIF	1/VIF
Exp	4,801	0,208
Devfin	2,55	0,392
Bmo	1,267	0,789
Ftr	1,052	0,95
FDI	1,03	0,971
Ipc	1,009	0,991
Mean VIF	1,951	

Source: Authors.