POSITIONING IN REGIONAL VALUE CHAINS: WHAT EFFECTS ON INCOME AND GENDER INEQUALITIES IN WEST AFRICA?

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Abstract: Integration into regional value chains (RVCs) has become a major issue for West African countries where income disparities and gender inequalities persist. This paper analyses the effect of positioning in RVCs on income and gender inequalities using panel data from West African countries from 2000 to 2021 and the Driscoll and Kraay estimator. The results show that the impact of CVRs on inequality depends on the level of local product processing. Countries limited to low value-added segments experience greater income concentration, while those that have developed a more integrated industry benefit from a better redistribution of gains. In terms of gender, women are mainly employed in precarious, low-paid jobs, with limited access to finance and productive infrastructure. The article recommends capacity-building for SMEs and introducing inclusive policies favoring women's access to productive resources and economic opportunities. Finally, a more balanced distribution of benefits between regions is essential to ensure inclusive and sustainable growth.

Keywords: Value chains, Inequalities, Gender, West Africa

JEL Classifications: F15, I24, O19, O55

1.   INTRODUCTION

Gender equality and women's empowerment are essential factors for enhancing economic growth, alleviating poverty, and achieving the Sustainable Development Goals (SDGs) (Cuberes and Teignier, 2014; Karoui and Feki, 2018). The World Bank defines gender equality as a development goal in its own right and also highlights the economic benefits that can be obtained by ensuring equality for the female population. The inclusion and participation of all groups in society in public decision-making help to ensure that public policies and services address the specific needs and realities of women and men from diverse backgrounds (OECD, 2020).

In recent decades, there has been a significant convergence in the labor market outcomes for women and men. Nevertheless, working-age women continue to perform less favorably than men in many respects (OECD, 2023). This gender inequality is evident in the sectors of activity in sub-Saharan Africa. In this part of Africa, gender disparities persist despite progress in certain sectors of activity. According to World Bank data, women represent a slightly higher proportion than men in agricultural employment (46% compared with 44% in 2022) and in services (43% compared with 38%). However, this apparent progress masks a low female presence in the industrial sector, where men will occupy 16% of jobs in 2022, compared with just 9% for women. In addition to gender inequalities, income inequalities represent major obstacles for development experts, international organizations, researchers, and political decision-makers striving to resolve them (Khanday & Tarique, 2023; Sethi *et al.*, 2021).

Widening economic disparities not only affect individual and collective well-being but also dampen long-term growth prospects, perpetuating a vicious circle of economic insecurity (Kim & Rhee, 2022; Piketty & Yang, 2022). In addition, rising inequality frequently fuels socio-political tensions, encourages opportunistic practices such as rent-seeking, fosters corruption, and erodes trust in institutions (Goni, 2011; Stiglitz, 2013). In particular, Rancière and Kumhof (2010) argue that income disparities were a determining factor in the Great Depression of the 1930s and the financial crisis of 2007. Correcting these imbalances, therefore, appears to be imperative if we are to ensure equitable and sustainable economic growth (Berg *et al.*, 2018) while limiting the vulnerability to poverty of a large section of the population (Mallick *et al.*, 2020). These findings have led researchers to take a closer look at the determinants of gender

inequality (Domínguez-Villalobos and Brown-Grossman, 2010; Juhn *et al.*, 2013; Besedeš *et al.*, 2021) and income inequality (Ametoglo *et al.*, 2018; Adams *et al.*, 2008; Anyanwu *et al.*, 2016; Beckfield, 2009).

Value chains are production networks with a series of activities (segments) carried out by entities (countries) located at several points in space, which are necessary to deliver finished goods or services to final consumers (Porter 1990; Ilahi *et al.*, 2019). African countries are particularly vulnerable because of their high dependence on commodities (Baita and Wonyra, 2023). The continent's heavy dependence on raw materials could hamper the development of agricultural value chains (UNCTAD, 2022). The value chain concept has emerged as a central framework in development approaches and is now a key lever for the transition to sustainable food systems (Food and Agriculture Fund of the United Nations, 2014a). Comparative analyses have amply demonstrated that the promotion of gender and income equality and the dynamics of economic growth can be mutually reinforcing, while imbalances often generate additional costs and inefficiencies (World Bank, 2001; World Bank *et al.*, 2009).

Work on gender in global value chains focuses on women's labour-intensive and low-paid work (income inequality) in production, an issue that is prevalent in all sectors. This can have a positive or negative impact on women's economic and social emancipation. Barrientos (2019) points out that the inclusion of women in global value chains is an opportunity for developing countries and emerging economies. This inclusion can empower women economically. When countries can improve their position in value chains, women can enjoy not only greater economic benefits but also employment opportunities (Barrientos, 2019)

Existing studies on value chain participation in West Africa have not sufficiently explored the interaction between gender and income inequalities. For example, Fontana (2013) analyses how women are integrated into global value chains but without particular attention to the impact on their incomes. Similarly, Okah Efogo *et al.* (2022) focus on foreign direct investment and its link to value chains without taking into account gender-based income disparities. Baita and Wonyra (2023) explore the overall effect of gender in the development of GVCs in Africa without specifically addressing income inequality. Alhassan *et al.* (2021) focus on the roles of African institutions in regional participation in value chains but omit the aspect of gender inequalities.

Wolszczak-Derlacz and Parteka (2018), on the other hand, study the effects of offshoring on wages without addressing gender disparities. By addressing these shortcomings, this article offers a more integrated analysis, simultaneously addressing the effects of value chains on gender and income inequalities.

This study analyses the effect of regional value chains on income and gender inequalities in West Africa. Based on the Heckcher-Ohlin Samuelson (HOS) theory, this paper assesses the effect of West African countries' participation in value chains on income and gender inequality. Panel data from West African countries covering the period 2000-2021 are used in this paper. The estimation technique of Driscoll & Kraay (1998) is used to estimate our econometric model. The results show that the impact of CVRs on inequality depends on the level of local product processing. Countries limited to low value-added segments experience greater income concentration, while those that have developed a more integrated industry benefit from a better redistribution of gains. In terms of gender, women are mainly employed in precarious, low-paid jobs with limited access to finance and productive infrastructure.

The rest of the article is organized as follows: Section 2 presents the review of the thematic literature; Section 3 discusses the methodological approach; Section 4 presents the results and discussions; and the final section is devoted to the conclusion.

2.   LITERATURE REVIEW

2.1. The value chain and gender inequality

The work of Bataka (2024) empirically investigates the effects of participation in global value chains (GVCs) on gender inequality in sub-Saharan Africa (SSA) from 1990 to 2015. The results show that participation in GVCs is beneficial in reducing gender inequalities in SSA. The study also highlights the role of women's education in the relationship between participation in CVMs and gender inequalities. The dynamics of increasing participation in CVMs driven by the positions held by qualified women can lead to an increase in their salaries (Staritz and Reis 2013; Bamber and Staritz 2016). Women's access to these specific nodes of CVM participation further increases the feminization of employment, wage improvements, and women's position in CVM participation and other representations of society, particularly in political representations. These induced effects would lead to a reduction in

gender inequalities (Bataka, 2024). Villalobos and Grossman (2010) analyze the effects of export orientation and other characteristics representing the industrial bases of restructuring on gender pay inequalities for the period 2001-2005. The results show a negative effect of export orientation on men's and women's wages and the gender wage ratio, meaning that women lose out in both absolute and relative terms.
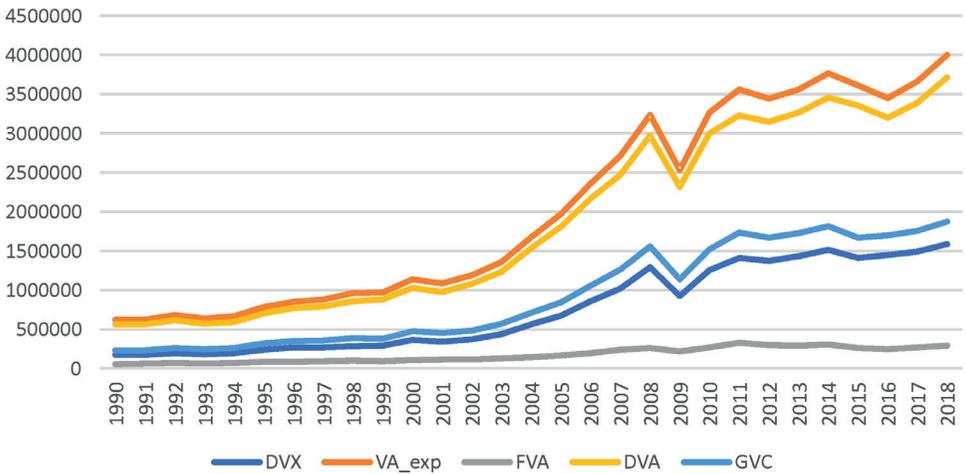
2.2. Value chain and income inequality

Participation in CVM trade is positively associated with productivity and per capita income growth for upper-middle- and high-income countries, while the positive effects are not significant for low-income countries (Ignatenko *et al.*, 2019). Inomata (2017) describes the gains from CVM participation from a development perspective. Although, in general, the literature indicates that CVM participation is associated with income and productivity growth, the redistributive effects of CVM integration are heterogeneous and complex (Kaplinsky 2000). Dollar (2017) shows that the benefits of CVM trade have been unevenly distributed across participants. For example, in the US, high-skilled labor and multinationals have reaped most of the productivity gains from CVM participation, while in China, average workers have benefited most. In particular, for the ICT sector in the US, more jobs have become available for high-skilled workers with rising earnings, while almost no change in earnings has been observed for low-skilled workers over the past 15 years (Dollar, 2017).

Previous studies have extensively explored the link between globalization in terms of trade and female employment and the redistribution of income between social classes. Despite the importance of participation in CVMs, existing work on the impact of CVM-driven international trade and gender and income inequalities is sparse. Our study on inequalities in West Africa contributes to a growing body of literature on the socio-economic impacts of CVMs in developing countries.

2.3. Stylised facts on participation in value chains and income and gender inequalities

The graph below illustrates West Africa's participation in global value chains (GVCs). Analysis of the graph reveals that four of the five indicators follow a similar trend, marked by a gradual increase until 2008, followed by a decline in 2009, probably due to the global financial crisis, and then a recovery in 2010. By

contrast, foreign value added incorporated into exports (FVA) shows a different dynamic and remains at a relatively low level. This indicator measures the share of foreign inputs incorporated into the region's exports. Its weakness in West Africa reflects a low dependence on imports in the production of exported goods, which may limit the region's integration into global value chains. All the indicators show a clear acceleration after the 2000s, probably due to the gradual opening up of the region's economies to international trade and foreign investment.

Figure 1: West African participation in CVMs

Source: Authors, based on the UNCTAD-Eora Global Value Chain Database (2024)

Value chains in West Africa are closely linked to income inequalities and gender issues. Analysis of the Gender Inequality Index (GII) in West Africa reveals significant disparities between member countries, with a high regional average of 0.579, reflecting strong gender inequality. Cape Verde (0.325) has the best performance, while Nigeria (0.677) is among the most unequal countries. These disparities can be explained by differences in women's access to education, reproductive health, employment, and political participation.

Over the last two decades, West Africa has seen remarkable economic growth, accompanied in several countries by a significant reduction in poverty. However, this dynamic has not benefited the entire population equally. Analysis of the data in the table above shows a reduction in income inequality in most ECOWAS countries between 2018 and 2021. All the countries for which data is available recorded a fall in their Gini index, indicating a better distribution

of wealth. The sharpest falls were seen in Burkina Faso (-5.6 points), Togo (-4.6 points) and Niger (-4.4 points), which can be attributed to more inclusive economic policies and improved access to social services.

Table 1: Gender inequality index for ECOWAS countries

Country	Gender inequality index	
	Index	Rank
Cape Verde	0,325	75
Senegal	0,505	129
Ghana	0,512	130
Burkina Faso	0,577	146
Togo	0,578	147
Gambia	0,585	149
Mali	0,607	153
Niger	0,609	154
Ivory Coast	0,612	156
Sierra Leone	0,613	157
Guinea-Bissau	0,631	159
Benin	0,649	160
Liberia	0,656	161
Nigeria	0,677	165

Source: Authors based on UNDP data (2024)

Table 2: The GINI index for West African countries

Country	*Years*	
	2018	2021
Benin	37,9	34,4
Burkina Faso	43	37,4
Cabo Verde		
Ivory Coast	37,2	35,3
Gambia		
Ghana		
Guinea-Bissau	34,8	33,4
Liberia		
Mali	36	35,7
Nigeria	35,1	
Niger	37,3	32,9
Senegal	38,3	36,2
Sierra Leone	35,7	
Togo	42,5	37,9

Source: Authors, based on WDI data (2024)

3.   METHODOLOGICAL APPROACH

The model used in this article draws on the theoretical work of Becker (1957) and the HOS model. Each of these theoretical approaches shows the impact of income and gender inequalities on the labour market in international trade. In light of these two theories, we assume an increase in competition with trade (Becker, 1957), as well as an increase in the employment of female labour and its price (wages) in developing countries (HOS theorem). Following the logic of these theories, we can predict a reduction in income and gender inequalities in the labour market in developing countries as a result of international trade.

The economic literature theoretically predicts that international trade widens the wage gap between different income groups. Blanchard and Willmann (2016), Costinot and Vogel (2010), Helpman *et al* (2010a, b), Helpman *et al* (2016), Manasse and Turrini (2001), Sampson (2014) and Yeaple (2005), among others, show in their respective models that international trade in goods widens the wage gap within countries.

Building on the work of these authors, this paper explores the interactions between country participation in regional value chains and inequality within the region's economies while controlling for the other main economic, technological, and institutional determinants of income disparities. In particular, this paper introduces the gender aspect of the relationship between country participation in regional value chains and income inequality.

Formally, we estimate the following regression equation:

$$GINI_{it} = \beta_0 + \beta_1 CVR_{it} + \beta_2 IDE_{it} + \beta_3 X_{it} + \gamma_t + \mu_{it}$$

Where $Gini_{i,t}$ is the Gini index for household market income and represents our measure of income inequality in country i at period t. It is used in logarithmic terms to attenuate heteroscedasticity and increase the efficiency of the fixed effects estimator. It is used in logarithmic terms to attenuate heteroscedasticity and increase the efficiency of the fixed effects estimator. It is used in logarithmic terms to attenuate heteroscedasticity and increase the efficiency of the fixed effects estimator. The $CVR_{i,t}$ variable includes different indices of participation in regional value chains and positioning of economies based on input-output tables, while the $FDI_{i,t}$ variables represent FDI-based indicators that reflect the involvement and positioning of countries in global value chains from a functional point of view.

The term $X_{i,t}$ comprises a set of variables that control for the main determinants of income distribution identified in the literature, which mainly relate to countries' economic, technological, and institutional characteristics. The terms γ_i and δ_t represent country and time-fixed effects, which respectively account for unobserved, time-invariant country-specific characteristics (e.g., geographical location) and year-specific events that may impact both the dependent and explanatory variables. Finally, β_0 represents the constant, and $\varepsilon_{i,t}$ is the error term.

In this article, we use the Gini index to measure income inequality within West African countries. This widely adopted indicator has two important advantages. First, it is a comprehensive measure of income inequality within economies, as its evolution takes into account changes in the functional distribution of income and wage inequality. Given that previous theoretical contributions have shown that participation in global value chains and the positioning of economies can affect income inequality, we believe that this indicator is the most appropriate to provide a comprehensive assessment of the distributional consequences of countries' participation in global value chains (Solt, 2020).

The second important advantage of the Gini index is that it is available for a wide range of high- and low-income countries and covers a remarkably long period, making it the most appropriate tool for our analysis.

Based on the empirical literature on global value chains, this article uses in the analysis of trade in value-added, the index of participation in global value chains, and the index of position in global value chains (Hummels *et al.*, 2014; Johnson and Noguera, 2012; Giammetti *et al.*, 2022; Arriola *et al.*, 2022).

he GVC position index captures the positioning of countries in global value chains at the "product level". This indicator, proposed for the first time by Koopman *et al* (2010), is designed to measure the relative extent of countries' upstream and downstream links in global value chains, with values being higher the further upstream countries are in global production chains.

We also monitor countries' overall participation in GVCs by including the GVC Participation Index. This indicator takes into account the backward and forward linkages of economies in global value chains.

Not all of these variables for trade in GVCs are expected to capture the value chain functions performed by economies (Timmer *et al.*, 2019;

Timmer *et al.*, 2021). Therefore, we combine these indicators with FDI data to approximate the functional profile of countries along GVCs.

Our empirical analysis takes account of several key country characteristics that affect their distribution patterns. First, we control for GDP per capita in both linear and squared terms. This is consistent with the seminal contribution of Kuznets (1955), who suggested that the evolution of income inequality within countries shows an inverted U-shaped relationship with countries' level of economic development.

Second, technological change is a well-known factor in income disparities, particularly because of the positive impact it can have on wage inequality in advanced countries (Autor *et al.*, 1999; Card and DiNardo, 2002; Acemoglu and Autor, 2011). Thus, we control for the internet penetration rate, which is an indicator of ICT available for a wide range of countries worldwide (Paglialunga *et al.*, 2022). Based on the work of Hartmann *et al.* (2017) and Van Reenen (2011), we include the secondary school enrolment rate. This variable represents a proxy for the overall level of skills possessed by the workforce, allowing us to further control for potential skill-biased effects on wage income dispersion.

Trade openness is included in this model as a measure of the level of integration of countries in the global economy. Trade openness detects the distinct impact of trade in CVMs from the effect on income inequality due to the overall involvement of economies in international trade flows (Constantinescu *et al.*, 2019).

Finally, we control for the percentage of the rural population with access to electricity. This control variable aims to capture access to basic services for the rural population, which can have significant potential to mitigate income disparities, particularly in developing countries (Castaneda *et al.*, 2018; Sarkodie and Adams, 2020).

The data for all these variables is taken from the World Bank's World Development Indicators (WDI) database.

Table 3 presents the descriptive statistics for all the variables included in our empirical analysis.

The empirical strategy adopted in this study consists of using the Driscoll & Kraay (1998) estimator based on the literature and the various specific tests carried out. This technique was motivated by the literature on panel model regression with special dependence, rather than the generalized method

Table 3: Summary of Variables Used

Variables	Variable description	Expected sign	Source
Income inequality (GINI)	Gini index based on market income	+/-	SWIID (2022)
Value added in agriculture.	Value added in the agricultural sector as a percentage of GDP.	+	WDI (2022)
Value added in industry.	Value added in the industrial sector as a percentage of GDP.	+	WDI (2022)
Commercial opening	Measures the level of integration of countries in the global economy	+	WDI (2022)
GDP per capita	Measures a country's level of economic development.	+	WDI (2022)
Internet penetration rate	The ICT indicator is a well-known factor in income disparities.	+	WDI (2022)
Male activity rate (male workforce)	Men's share of the total workforce.	+	ILO (2022)
Female activity rate (female workforce)	Share of women in the total workforce.	+	ILO (2022)
Global value chains	Value chain index by country.	+	UNCTAD (2022)
Foreign direct investment	Foreign direct investment inflows as a % of GDP.	+	WDI (2022)
Schooling for women	Gross primary school enrolment rate for women.	+	WDI (2022)
Access to electricity	It aims to improve access to basic services for the rural population.		WDI (2022)
Infrastructure	Transport infrastructure index.	+	AfDB (2022)
Education	It represents an approximation of the overall skill level of the workforce.	+	WDI (2022)

Source: Authors

of moments (GMM). GMM is the efficient instrument that overcomes endogeneity when the inertia effect of the dependent variable is likely to occur in regressions but does not take into account cross-sectional dependence (Blundell & Bond, 1998; Roodman, 2009). Indeed, the approach of Driscoll & Kraay (1998) is based on the semi-parametric estimation technique proposed by Hoechle (2007). This approach is adapted to the general form of cross-sectional dependence and allows the sequence of cross-sectional means to be corrected to obtain a robust covariance matrix estimator of the general forms of cross-sectional dependence (Driscoll & Kraay, 1998). On the other hand,

other approaches assume that dependence can arise from sources such as spillover effects through imitation and nearest or distant neighbours (common economic and social factors); this general form does not offer a rigorous estimate. However, to deal with its general forms, the approach of Hoechle (2007) also makes it possible to resolve the problems of heteroscedasticity and error autocorrelation. The approach highlights fixed effects and allows us to obtain robust standard deviations.

For a better consideration of the estimation technique appropriate to our study, several panel tests are performed. First, we performed the cross-sectional dependence (CD) test. The CD test shows that most of our variables are statistically significant at the 1% level, except the CVM and EDI position variables. The results associated with this CD test suggest rejection of the null hypothesis of spatial independence between individuals and over time (see Table A1 in the Appendix). This result shows that there may be unobserved common factors between the individuals included in our study. The common factor could be CVM through the adoption of the same production techniques by companies and trade. To diagnose cross-sectional dependence, the second-generation Dependence Augmented Dickey-Fuller (CADF) unit root test is imperative, principally that of Pesaran (2007). The CADF test postulates the presence of a unit root in our variables under the null hypothesis against the alternative hypothesis that there is no unit root in our variables. The results show that there is no unit root (stationary). However, the CADF statistics are below the 1%, 5%, and 10% thresholds in the majority of cases (see Table A2 in the Appendix). The estimation technique used to take account of cross-sectional dependency in our study is the most appropriate to avoid biased results.

4.   RESULTS AND DISCUSSION

4.1. Descriptive Statistics

Analysis of the descriptive statistics provides a better understanding of the distribution of the variables and identifies disparities between the countries studied. Firstly, the *position* variable, which measures the integration of countries in value chains, has a mean of 1.029 with a relatively low standard deviation of 0.126. Although most countries have levels of integration close to this mean, the extreme values show disparities between countries.

Although most countries have levels of integration close to this average, the extreme values show significant differences. Some countries are, therefore, well integrated into regional value chains, while others remain on the fringes. This heterogeneity could be linked to differences in industrial policies and commercial infrastructures.

About this economic integration, gender inequality shows an average of 0.624. This relatively high level reflects the persistent gaps between men and women in terms of access to economic resources and opportunities. However, the variation between 0.326 and 0.814 indicates that some countries have made progress in reducing gender inequalities while others continue to face strong discrimination. These disparities could be influenced by public policy, education, and women's participation in the labour market.

Gender inequality can also be related to income inequality, measured by the Gini index. This has a mean of 54.53 with a standard deviation of 7.061, suggesting that income distribution is highly unequal in several of the countries in the sample. The extreme values, ranging from 35.54 to 74.24, show that some countries have a very high concentration of wealth, while others have a more balanced distribution. These inequalities could be exacerbated by differences in access to education, infrastructure, and economic opportunities.

Table 4: Descriptive Statistics for Variables

VARIABLES	N	Average	Standard deviation	Minimum	Maximum
Position	223	1.029	0.126	0.805	1.546
GII	230	0.624	0.0701	0.326	0.814
Gini index	294	54.53	7.061	35.54	74.24
GDP per capita	308	3,151	1,644	1,191	9,112
ICT	305	11.37	14.70	0.0177	71.38
IDE	294	4.746	10.50	-2.545	103.3
Commercial opening	264	56.75	18.03	22.97	117.8
Infrastructure	238	7.338	6.162	1.212	28.43
FVA	247	1.249e+07	4.697e+07	0	2.600e+08
DVA	247	2.392e+08	6.439e+08	0	3.200e+09
DVX	247	9.396e+07	2.771e+08	0	1.400e+09
Agricultural added value	303	29.52	13.90	4.410	79.04
Industrial added value	303	18.81	5.997	3.243	34.09
Access to electricity	299	38.03	22.88	1.300	95.50
Help for trade	280	76.27	85.90	0.0240	391.8

Source: Authors

4.2. Results of the Econometric Estimates

The econometric results presented in Table 5 show the link between income inequality and the explanatory variables, in particular integration into regional value chains, economic structure and various development indicators.

Analysis of the results shows that greater integration into regional value chains is associated with an increase in income inequality in West Africa. This result is in line with theoretical expectations and the existing literature on international trade and inequality. Indeed, Antràs *et al.* (2019) have shown that integration into value chains, particularly in high-value-added segments, can increase income disparities by favouring certain sectors or economic groups at the expense of others. In the context of developing economies, this integration often benefits the most competitive firms and skilled workers, thus accentuating income disparities between skilled and unskilled workers.

The coefficient of squared GDP per capita is positive and significant in all model specifications, indicating a non-linear effect of economic growth on inequality. In other words, beyond a certain threshold, economic growth tends to increase income inequality. This result is consistent with the hypothesis of Kuznets (1955), which suggests an inverted-U curve between growth and inequality.

The 'Internet' variable has a negative and significant coefficient in all specifications, suggesting that improved Internet access reduces income inequality. In the context of West African countries, the positive effects observed here may be linked to greater digital inclusion and increased opportunities for the self-employed and small businesses that use the internet to access new markets.

The results also show that access to electricity has a negative and significant effect on income inequality, indicating that improving access to energy helps to reduce income disparities. This finding is consistent with the work of Calderón and Servén (2010), who show that infrastructure plays a key role in reducing inequality by facilitating access to economic opportunities, particularly for rural and marginalized populations.

Finally, the results show that the value added by industry has a negative and significant effect on inequality. This indicates that industrialization contributes to reducing income gaps, which is consistent with the literature on structural transformation and inequality reduction (Rodrik, 2016). In contrast, the value added to agriculture is not significant, suggesting that the agricultural sector,

as currently structured, does not play a key role in reducing inequality. This finding may be linked to low agricultural productivity or a concentration of income on certain large-scale farms, which has been documented in several recent studies (McMillan *et al.*, 2014).

Table 5: Results of Econometric Estimates for Income Inequality

Variables	Gini	Gini	Gini	Gini	Gini	Gini
Position	0.216***					
	(0.065)					
GDP per capita	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP per capita 2	0.083***	0.093**	0.111**	0.122***	0.132***	0.161***
	(0.019)	(0.036)	(0.039)	(0.039)	(0.029)	(0.021)
Internet	-0.011**	-0.016**	-0.021***	-0.022***	-0.030***	-0.034***
	(0.005)	(0.007)	(0.006)	(0.006)	(0.007)	(0.007)
IDE	0.004	-0.005	-0.007	-0.003	-0.009*	-0.008*
	(0.004)	(0.005)	(0.007)	(0.006)	(0.005)	(0.004)
Commercial opening	-0.027*	-0.031	-0.026	-0.036*	-0.027	-0.022
	(0.013)	(0.020)	(0.018)	(0.019)	(0.017)	(0.016)
Electricity	-0.148***	-0.156***	-0.153***	-0.155***	-0.082***	-0.080***
	(0.031)	(0.042)	(0.037)	(0.039)	(0.028)	(0.027)
Infrastructure	-0.038	-0.106**	-0.081*	-0.065*	-0.108***	-0.103***
	(0.023)	(0.038)	(0.038)	(0.035)	(0.034)	(0.032)
Help for trade	0.002	0.004	0.009	0.009	0.013**	0.010*
	(0.004)	(0.006)	(0.006)	(0.006)	(0.005)	(0.005)
FVA		0.000***				
		(0.000)				
DVX			0.013			
			(0.008)			
DVA				0.010		
				(0.015)		
Added value Agri					-0.020	
					(0.022)	
Value added Ind						-0.035*
						(0.019)
Constant	3.206***	3.427***	3.062***	2.876***	2.574***	2.127***
	(0.214)	(0.517)	(0.555)	(0.523)	(0.481)	(0.382)
Comments	128	148	123	123	184	184
F-Stat	127711.54	46328.72	4092.64	82003.28	1021.22	6829.02
Fisher-Prob	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pays-FE	YES	YES	YES	YES	YES	YES

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The results shed light on the determinants of income inequality, highlighting in particular the role of integration into value chains, infrastructure, and trade openness. However, beyond overall economic disparities, a central issue remains that of gender inequalities. The following section therefore looks at how these same dynamics specifically influence gender gaps, taking into account the interactions between regional integration, access to resources, and women's economic empowerment.

4.3. Gender inequalities and regional value chains

This section analyses the determinants of gender inequalities and their interaction with participation in regional value chains. Several significant variables shed light on the relationship between economic integration and gender inequality, as well as on the role of infrastructure, trade and foreign direct investment.

As before, the 'Position' variable is significant in columns (1) and (2). In the first specification, it has a positive effect, indicating that better integration into regional value chains is associated with an increase in gender inequality. One possible explanation for these ambivalent results lies in the quality of integration into regional value chains. The literature shows that participation in global value chains can either accentuate or attenuate gender inequalities, depending on the type of jobs and sectors involved. Tejani and Milberg (2016) have shown that if value chains are dominated by male-intensive industries (mining, heavy industry), integration tends to exacerbate gender inequalities. On the other hand, if they involve sectors that favour female employment (textiles, agri-food, services), they can reduce these inequalities.

The effect becomes even more complex when we introduce the "Position*GII" interaction, which is positive and highly significant. This means that the effect of integrating West African countries into value chains depends on the initial level of gender inequality. In countries where gender inequalities are already high, greater integration could, on the contrary, reinforce these inequalities, which is in line with the conclusions of Seguino (2000) on the role of liberalization in the segmentation of the labour market according to gender.

FDI has a positive and significant effect in columns (1) and (3). This suggests that foreign investment promotes the reduction of gender inequalities,

probably by creating more inclusive employment opportunities. These results are consistent with the work of Kucera and Tejani (2014), who show that FDI, particularly in manufacturing sectors, increases women's participation in the labour market. However, some authors such as Braunstein (2012) warn that this effect may be conditional on the nature of the jobs created: if FDI concentrates on sectors with low added value and precarious working conditions, it may perpetuate forms of economic segregation instead of reducing inequalities.

The "Aid for Trade" variable is negative and significant in all specifications. This indicates that Aid for Trade contributes to reducing gender inequality. This result is consistent with the work of Busse and Nunnenkamp (2009), who show that Aid for Trade programs can improve the integration of women into exporting sectors, provided that these programs also target training and access to productive resources. However, it has also been documented that Aid for Trade can sometimes be captured by large exporting companies, benefiting men more than women if the latter are under-represented in export production chains (Van Staveren, 2020).

Table 6: Results of Econometric Estimates for Gender Inequality

Variables	*GII*	*GII*	*GII*
Position	0.131*	-0.638***	
	(0.067)	(0.016)	
Position*GII		1.028***	0.686***
		(0.013)	(0.049)
GDP per capita	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
GDP per capita 2	-0.021	0.002	0.004
	(0.014)	(0.002)	(0.004)
Internet	0.001	-0.001	0.005**
	(0.005)	(0.001)	(0.002)
IDE	0.005*	0.000	0.005***
	(0.003)	(0.000)	(0.001)
Comm. opening	-0.008	0.000	0.001
	(0.014)	(0.001)	(0.006)
Electricity	-0.047***	0.004**	-0.020**
	(0.015)	(0.002)	(0.007)
Infrastructure	0.023**	-0.001	-0.016***
	(0.011)	(0.001)	(0.005)
Help with comm.	-0.009***	-0.000**	-0.004***

Variables	GII	GII	GII
	(0.003)	(0.000)	(0.001)
Added value Agri			0.014
			(0.011)
Constant	1.046***	0.576***	0.204**
	(0.238)	(0.031)	(0.094)
Comments	108	108	108
F-Stat	37262.21	2548703.95	12447.90
Fisher-Prob	0.0000	0.0000	0.0000
Pays-FE	YES	YES	YES

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The results show that integration into regional value chains has a complex and conditional impact on gender inequalities. While it can help to reduce these inequalities, its effect is highly dependent on the initial level of inequality and the supporting policies put in place. Other factors, such as access to infrastructure, electricity, and the internet, play a key role in reducing gender inequalities, while FDI and aid for trade also appear to encourage greater inclusion of women in the economy. These results suggest that to maximize the benefits of economic integration in terms of gender equality, targeted policies need to be put in place, particularly in the areas of education, access to credit, and social protection.

4.4. Analysis of the robustness of the results

Tables A4 to A8 present the robustness results of the econometric estimates. These results are found using the fixed-effects method of moment quantile regression (MMQR) developed by Machado & Silva (2019). The latter, by specification, deals with endogeneity, more precisely, the reverse causality of repressors (positioning in CVMs, agriculture, and industrialization). Endogeneity could be possible in the differential effects of income inequality and gender inequality on positioning in CVMs, agriculture, and industrialization according to different quantiles. It also addresses the problems of heteroskedasticity and unobserved values in the regressions. The MMQR estimator differs from other standard estimators such as Canay (2011) and Koenker (2004) since the time-invariant country fixed effects vary at each different quantile of the conditional distribution of the dependent variable (income inequality and gender income

inequality). The empirical analysis is performed on five quantiles (Q10 is the 10th quantile, Q25 is the 25th quantile, Q50 is the 50th quantile, Q75 is the 75th quantile, and Q90 is the 90th quantile). The results of the robustness check reveal overall significance. The signs of the coefficients of our dependent and control variables remain unchanged in most quantiles compared with the initial results. However, slight differences are observed in the strength and significance of the coefficients, differences that are probably due to the specifications of each estimation technique.

5. CONCLUSION AND ECONOMIC POLICY IMPLICATIONS

This study takes place against a backdrop in which regional integration and trade facilitation are seen as levers for economic development in West Africa. The countries of the region are committed to strengthening their integration into regional value chains (RVCs) to maximize the benefits of intra-regional trade and reduce socio-economic inequalities. However, the distribution of the gains from this integration remains a central issue, particularly regarding income and gender inequalities. This research aimed to analyse the effect of TRCs on these dimensions and to identify the underlying mechanisms that might explain these dynamics.

The results show that integration into the CVRs has a contrasting impact on economic inequalities. While it can stimulate growth and generate employment opportunities, it does not benefit all sections of the population in the same way. Countries that restrict themselves to low value-added segments experience a concentration of income to the benefit of the dominant players in the TRCs, thereby exacerbating inequalities. Conversely, countries that invest in processing and diversifying their exports manage to spread the economic gains more evenly.

These results also highlight the structural inequalities that limit women's participation in CVRs. Women are often employed in low-paid, insecure jobs, particularly in low value-added sectors such as agriculture and textiles. Limited access to finance, productive infrastructure and technical training is a major obstacle to women moving up the value chain. Furthermore, persistent social norms and discrimination in access to productive resources accentuate these disparities.

The implications of these results for economic policy are manifold. Firstly, the governments of West African countries need to promote productive

diversification that will enable their economies to capture more value added. This requires investment in industrial infrastructure, innovation, and capacity-building for local businesses. Secondly, it is essential to facilitate SMEs' access to CVRs through financial support policies, simplification of administrative procedures, and improvement of logistics infrastructures.

In addition, reducing gender inequalities in the CVRs requires targeted measures, in particular increasing women's access to finance and technical training. Programmes to support female entrepreneurship and incentives to increase the representation of women in high value-added sectors are also essential. In addition, social protection and lifelong learning policies need to be put in place to support vulnerable workers, particularly those exposed to the increased competition brought about by regional integration.

Finally, spatial planning and infrastructure development in rural areas must be prioritized to avoid excessive concentration of economic benefits in urban centres. A better geographical distribution of economic opportunities would reduce spatial inequalities and ensure more inclusive growth.

References

Adams Jr, R. H., Cuecuecha, A., & Page, J. (2008). The impact of remittances on poverty and inequality in Ghana. *World Bank Policy Research Working Paper, (4732).*

Acemoglu, D., & Autor, D. (2011). Skills, tasks and technologies: Implications for employment and earnings. In O. Ashenfelter & D. Card (Eds.), *Handbook of Labor Economics, 4b* (pp. 1043-1171). Elsevier.

Alhassan, A., Zoaka, J. D., & Ringim, S. H. (2021). Africa as headwaiter at the dining table of global value chains: Do institutions matter for her participation? *African Development Review, 33*(3), 560-576.

Ametoglo, M. E. S., Guo, P., & Wonyra, K. O. (2018). Regional integration and income inequality in ECOWAS zone. *Journal of Economic Integration, 33*(3), 604-627.

Anyanwu, J. C., Erhijakpor, A. E., & Obi, E. (2016). Empirical analysis of the key drivers of income inequality in West Africa. *African Development Review, 28*(1), 18-38.

Antras, P., & Chor, D. (2019). On the measurement of upstreamness and downstreamness in global value chains. In L. Y. Ing & M. Yu (Eds.), *World Trade Evolution: Growth, Productivity and Employment* (pp. 126-194). Routledge.

Arriola, C., Cadestin, C., Kowalski, P., Guilhoto, J. J. M., Miroudot, S., & van Tongeren, F. (2023). Challenges to international trade and the global economy: Recovery from COVID-19 and Russia's war of aggression against Ukraine.

Autor, D. H., Katz, L. F., & Krueger, A. B. (1999). Computing inequality: Have computers changed the labor market? *The Quarterly Journal of Economics, 113*(4), 1169-1213.

Baita, K. E., & Wonyra, K. O. (2023). Global effect of gender in the development of global value chains in the African context. *African Development Review, 35*(4), 365-375.

Bamber, P., & Staritz, C. (2016). The gender dimensions of global value chains. International Center for Trade and Sustainable Development.

Barrientos, S. (2019). *Gender and Work in Global Value Chains: Capturing the Gains?* Cambridge University Press.

Bataka, H. (2024). Global value chains participation and gender inequalities in Sub-Saharan Africa: Importance of women education. *International Economics, 178*, 100483.

Beckfield, J. (2009). Remapping inequality in Europe: The net effect of regional integration on total income inequality in the European Union. *International Journal of Comparative Sociology, 50*(5-6), 486-509.

Becker, H., & Geer, B. (1957). Participant observation and interviewing: A comparison. *Human Organization, 16*(3), 28-32.

Berg, A., Ostry, J. D., Tsangarides, C. G., & Yakhshilikov, Y. (2018). Redistribution, inequality, and growth: New evidence. *Journal of Economic Growth, 23*, 259-305.

Besedeš, T., Lee, S. H., & Yang, T. (2021). Trade liberalization and gender gaps in local labor market outcomes: Dimensions of adjustment in the United States. *Journal of Economic Behavior & Organization, 183*, 574-588.

Blanchard, E., & Willmann, G. (2016). Trade, education, and the shrinking middle class. *Journal of International Economics, 99*, 263-278.

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics, 87*(1), 115-143.

Braunstein, E. (2012). Neoliberal development macroeconomics: A consideration of its gendered employment effects. *UNRISD Research Paper, No. 2012-1*.

Busse, M., & Nunnenkamp, P. (2009). Gender disparity in education and the international competition for foreign direct investment. *Feminist Economics, 15*(3), 61-90. https://doi.org/10.1080/13545700902964340

Calderón, C., & Servén, L. (2010). Infrastructure and economic development in Sub-Saharan Africa. *Journal of African Economies, 19*(suppl_1), i13-i87.

Canay, I. A. (2011). A simple approach to quantile regression for panel data. *The Econometrics Journal, 14*(3), 368-386. https://doi.org/10.1111/j.1368-423X.2011.00349

Card, D., & DiNardo, J. E. (2002). Skill-biased technological change and rising wage inequality: Some problems and puzzles. *Journal of Labor Economics, 20*(4), 733-783.

Castaneda, R. A., Doan, D. D. T., Newhouse, D. L., *et al.*. (2018). A new profile of the global poor. *World Development, 101*, 250-267.

Constantinescu, C., Mattoo, A., & Ruta, M. (2019). Does vertical specialisation increase productivity? *World Economy, 42*(8), 2385-2402.

Costinot, A., & Vogel, J. (2010). Matching and inequality in the world economy. *Journal of Political Economy, 118*(4), 747-786.

Cuberes, D., & Teignier, M. (2014). Gender inequality and economic growth: A critical review. *Journal of International Development, 26*(2), 260-276.

Dollar, D. R., Inomata, S., Degain, C., Meng, B., Wang, Z., Ahmad, N., ... & Kidder, M. (2017). *Global value chain development report 2017: Measuring and analysing the impact of GVCs on economic development.*

Domínguez-Villalobos, L., & Brown-Grossman, F. (2010). Trade liberalization and gender wage inequality in Mexico. *Feminist Economics, 16*(4), 53-79.

Driscoll, J. C., & Kraay, A. C. (1998). Consistent covariance matrix estimation with spatially dependent panel data. *Review of Economics and Statistics, 80*(4), 549-560.

FAO. (2014a). *Developing sustainable food value chains: Guiding principles*. Food and Agriculture Organization of the United Nations.

Fontana, M. (2013). Gender in economy-wide modelling: Looking back, looking forward. In *New Frontiers in feminist political economy* (pp. 154-174). Routledge.

Giammetti, R., Papi, L., Teobaldelli, D., & Ticchi, D. (2022). The network effect of deglobalisation on European regions. *Cambridge Journal of Regions, Economy and Society, 15*(2), 207-235.

Goni, E., López, J. H., & Servén, L. (2011). Fiscal redistribution and income inequality in Latin America. *World Development, 39*(9), 1558-1569.

Hartmann, D., Guevara, M. R., Jara-Figueroa, C., Aristaran, M., & Hidalgo, C. A. (2017). Linking economic complexity, institutions, and income inequality. *World Development, 93*, 75-93.

Helpman, E., & Itskhoki, O. (2010). Labour market rigidities, trade and unemployment. *The Review of Economic Studies, 77*(3), 1100-1137.

Helpman, E., Itskhoki, O., Muendler, M. A., & Redding, S. J. (2016). Trade and inequality: From theory to estimation. *The Review of Economic Studies, 84*(1), 357-405.

Hoechle, D. (2007). Robust standard errors for panel regressions with cross-sectional dependence. *The Stata Journal, 7*(3), 281-312.

Hummels, D., Jørgensen, R., Munch, J., & Xiang, C. (2014). The wage effects of offshoring: Evidence from Danish matched worker-firm data. *American Economic Review, 104*(6), 1597-1629.

Ignatenko, A. (2019). Buyer size, price discrimination, and quality differentiation in international trade. *Mimeo*.

Ilahi, M. N., Khachatryan, M. A., Lindquist, W., Nguyen, M. N., Raei, M. F., & Rahman, J. (2019). Lifting growth in the Western Balkans: The role of global value chains and services exports. *International Monetary Fund*.

Inomata, S. (2017). Impact of new technologies on the organization of global value chains (1): Dynamic transformations within global value chain typology. *IDE Discussion Paper, 682*.

Johnson, R. C., & Noguera, G. (2012). Accounting for intermediates: Production sharing and trade in value added. *Journal of International Economics, 86*(2), 224-236.

Juhn, C., Ujhelyi, G., & Villegas-Sanchez, C. (2013). Trade liberalization and gender inequality. *American Economic Review, 103*(3), 269-273.

Karoui, K., & Feki, R. (2018). The effect of gender inequality on economic development: Case of African countries. *Journal of the Knowledge Economy, 9*, 294-300.

Kaplinsky, R. (2000). Globalisation and unequalisation: What can be learned from value chain analysis? *Journal of Development Studies, 37*(2), 117-146.

Khanday, I. N., & Tarique, M. (2023). Does income inequality respond asymmetrically to financial development? Evidence from India using asymmetric cointegration and causality tests. *The Journal of Economic Asymmetries*, *28*, e00341.

Kim, H., & Rhee, D. E. (2022). The effects of asset prices on income inequality: Redistribution policy does matter. *Economic Modelling, 113*, 105899.

Koenker, R. (2004). Quantile regression for longitudinal data. *Journal of Multivariate Analysis, 91*(1), 74-89. https://doi.org/10.1016/j.jmva.2004.05.006

Koopman, R., Powers, W., Wang, Z., & Wei, S. J. (2010). Give credit where credit is due: Tracing value added in global production chains (No. 16426). *National Bureau of Economic Research*.

Kucera, D., & Tejani, S. (2014). Feminization, defeminization, and structural change in manufacturing. *World Development, 64*, 569-582. https://doi.org/10.1016/j.worlddev.2014.06.028

Kumhof, M., & Rancière, R. (2010). Leveraging inequality: Long periods of unequal incomes spur borrowing from the rich, increasing the risk of major economic crises. *Finance & Development, 47*(4), 28-32.

Kuznets, S. (1955). International differences in capital formation and financing. In *Capital formation and economic growth* (pp. 19-111). Princeton University Press.

Machado, J. A. F., & Silva, J. S. (2019). Quantiles via moments. *Journal of Econometrics, 213*(1), 145-173. https://doi.org/10.1016/j.jeconom.2019.04.009

Mallick, H., Mahalik, M. K., & Padhan, H. (2020). Does globalization exacerbate income inequality in the two largest emerging economies? The role of FDI and remittances inflows. *International Review of Economics, 67*(4), 443-480.

Manasse, P., & Turrini, A. (2001). Trade, wages, and 'superstars'. *Journal of International Economics, 54*(1), 97-117.

McMillan, M., Rodrik, D., & Verduzco-Gallo, Í. (2014). Globalization, structural change, and productivity growth, with an update on Africa. *World Development, 63*, 11-32.

OECD. (2020). *Gender equality in public decision-making: A review of the evidence*. OECD Publishing. https://doi.org/10.1787/6a24b253-fr

OECD. (2023). *Working together for gender equality (abridged version): Which priorities?* OECD Publishing. https://doi.org/10.1787/6a24b253-fr

Okah Efogo, F., Wonyra, K. O., & Osabuohien, E. (2022). Foreign direct investment and participation of developing countries in global value chains: Lessons from the last decade. *International Review of Applied Economics, 36*(2), 264-284.

Paglialunga, E., Coveri, A., & Zanfei, A. (2022). Climate change and within-country inequality: New evidence from a global perspective. *World Development, 159*, 106030.

Pesaran, M. H. (2007). A simple panel unit root test in the presence of cross-section dependence. *Journal of Applied Econometrics, 22*(2), 265-312.

Piketty, T., & Yang, L. (2022). Income and wealth inequality in Hong Kong, 1981-2020: The rise of Pluto-communism? *The World Bank Economic Review, 36*(4), 803-834.

Porter, M. E. (1990). New global strategies for competitive advantage. *Planning Review, 18*(3), 4-14.

Rodrik, D. (2016). Premature deindustrialization. *Journal of Economic Growth, 21*, 1-33.

Roodman, D. (2009). How to do xtabond2: An introduction to difference and system GMM in Stata. *The stata journal*, *9*(1), 86-136.

Sampson, T. (2014). Selection into trade and wage inequality. *American Economic Journal: Microeconomics, 6*(3), 157-202.

Sarkodie, S. A., & Adams, S. (2020). Electricity access and income inequality in South Africa: Evidence from Bayesian and NARDL analyses. *Energy Strategy Reviews, 29*, 100480.

Seguino, S. (2000). Gender inequality and economic growth: A cross-country analysis. *World Development, 28*(7), 1211-1230. https://doi.org/10.1016/S0305-750X(00)00018-8

Sethi, P., Bhattacharjee, S., Chakrabarti, D., & Tiwari, C. (2021). The impact of globalization and financial development on India's income inequality. *Journal of Policy Modeling, 43*(3), 639-656.

SOLT, E. (2021). The role of the fiscal and monetary policies during the Covid-19 crisis in countries with high and lower income. *Balkan & Near Eastern Journal of Social Sciences (BNEJSS), 7*(3).

Staritz, C., & Reis, J. G. (2013). *Global value chains, economic upgrading, and gender: Case studies of the horticulture, tourism, and call center industries*. World Bank International Trade Department, Gender Development Unit.

Stiglitz, J. E. (2013). *A neoclassical analysis of the economics of natural resources*. SSRN.

Tejani, S., & Milberg, W. (2016). Global defeminization? Industrial upgrading and manufacturing employment in developing countries. *Feminist Economics, 22*(2), 24-54. https://doi.org/10.1080/13545701.2015.1120737

Timmer, M. P., Los, B., Stehrer, R., & de Vries, G. J. (2021). Supply chain fragmentation and the global trade elasticity: A new accounting framework. *IMF Economic Review, 69*(4), 656.

Timmer, M. P., Miroudot, S., & de Vries, G. J. (2019). Functional specialisation in trade. *Journal of Economic Geography, 19*(1), 1-30.

UNCTAD. (2022). *Trade and development report 2022: Development prospects in a fractured world – Global disorder and regional responses*. United Nations.

Van Reenen, J. (2011). Wage inequality, technology and trade: 21st century evidence. *Labour Economics, 18*(6), 730-741.

Van Staveren, I. (2020). *Gender and trade: A political economy perspective.* Routledge.

Villalobos, L., & Grossman, F. (2010). Trade liberalization and gender wage inequality in Mexico. *Feminist Economics*, *16*(4), 53-79.

Wolszczak-Derlacz, J., & Parteka, A. (2018). The effects of offshoring to low-wage countries on domestic wages: A worldwide industrial analysis. *Empirica, 45*(1), 129-163.

World Bank. (2024). *World Development Indicators* [Data set]. https://databank. worldbank.org/source/world-development-indicators

World Bank. (2009). *World Development Report 2009: Reshaping Economic Geography*. World Bank.

World Bank. (2001). *World Development Report 2000/2001: Attacking Poverty*. Oxford University Press.

Yeaple, S. R. (2005). A simple model of firm heterogeneity, international trade, and wages. *Journal of International Economics, 65*(1), 1-20.

APPENDICES

Table A1: Cross-sectional dependency test

Variables	CD-statistics	p-value	Correlation
Gini (Log)	3.80	0.000	0.087
gii	8.31	0.000	0.216
position	-1.53	0.125	-0.046
lfva	28.36	0.000	0.877
ldva	27.44	0.000	0.849
ldvx	28.81	0.000	0.891
lgdppercap~a	25.53	0.000	0.573
lgdp2	25.54	0.000	0.573
linternet	41.97	0.000	0.948
lide	-1.31	0.191	-0.040
ltradeopen~s	2.64	0.008	0.087
lelectricity	25.59	0.000	0.816
linfrastru~s	2.34	0.019	0.075
Laid_for_t~e	9.96	0.000	0.237
lagri_fore~y	2.07	0.039	0.048
lindustry	2.50	0.013	0.059

Table A2: unit root test

Variables	Statistics CADF	p-value
Gini (log)	2.134	0.984
gii	2.221	0.987
position	-2.825	0.002
fva (log)	-3.831	0.000
ldva	-2.890	0.002
ldvx	-5.263	0.000
lgdppercap~a	-3.630	0.000
lgdp2	-3.630	0.000
linternet	-2.937	0.002
lide	-4.438	0.000
ltradeopen~s	-5.197	0.000
lelectricity	-8.207	0.000
linfrastru~s	-3.521	0.000
Laid_for_t~e	-7.131	0.000
lagri_fore~y	-6.760	0.000
lindustry	-5.192	0.000

Table A3: Correlation matrix

Correlation matrix 1

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) lgini	1.000												
(2) position	-0.130*	1.000											
(3) lfva	-0.775***	0.126*	1.000										
(4) ldva	-0.370***	-0.006	0.812***	1.000									
(5) ldvx	-0.447***	0.081	0.852***	0.924***	1.000								
(6) lgdppercapita	-0.145**	-0.186***	0.510***	0.523***	0.488***	1.000							
(7) lgdp2	-0.145**	-0.186***	0.510***	0.523***	0.488***	1.000***	1.000						
(8) linternet	-0.181***	-0.256***	0.286***	0.256***	0.230***	0.548***	0.548***	1.000					
(9) lide	-0.083	0.311***	-0.004	-0.369***	-0.307***	0.027	0.027	0.199***	1.000				
(10) ltradeopenness	0.029	0.023	0.319***	0.175**	0.150*	0.642***	0.642***	0.416***	0.326***	1.000			
(11) lelectricity	-0.148**	-0.200***	0.431***	0.447***	0.374***	0.795***	0.795***	0.603***	0.037	0.645***	1.000		
(12) linfrastructu~s	0.408***	-0.198**	-0.150*	0.023	0.085	0.622***	0.622***	0.319***	-0.042	0.485***	0.433***	1.000	
(13) Laid_for_trade	-0.201***	-0.436***	0.183***	0.335***	0.259***	0.178***	0.178***	0.235***	0.005	0.224***	0.101*	-0.121*	1.000

*** p<0.01, ** p<0.05, * p<0.1

Correlation matrix 2

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) gii	1.000										
(2) position	0.204***	1.000									
(3) lagri_forestry	0.700***	0.413***	1.000								
(4) lgdppercapita	-0.564***	-0.186***	-0.724***	1.000							
(5) lgdp2	-0.564***	-0.186***	-0.724***	1.000***	1.000						
(6) linternet	-0.521***	-0.256***	-0.478***	0.548***	0.548***	1.000					
(7) lide	-0.174**	0.311***	0.050	0.027	0.027	0.199***	1.000				
(8) ltradeopenness	-0.598***	0.023	-0.579***	0.642***	0.642***	0.416***	0.326***	1.000			
(9) lelectricity	-0.542***	-0.200***	-0.681***	0.795***	0.795***	0.603***	0.037	0.645***	1.000		
(10) linfrastructu~s	-0.597***	-0.198**	-0.649***	0.622***	0.622***	0.319***	-0.042	0.485***	0.433***	1.000	
(11) Laid_for_trade	-0.071	-0.436***	-0.183***	0.178***	0.178***	0.235***	0.005	0.224***	0.101*	-0.121*	1.000

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A4: Quantile Regressions of Value Chains on Income Inequality

Quantiles	*Q10*[th]	*Q25*[th]	*Q50*[th]	*Q75*[th]	*Q90*[th]
Variables	gini	gini	gini	gini	gini
position	0.382	0.277	0.194	0.146	0.091
	(0.352)	(0.207)	(0.260)	(0.344)	(0.459)
lgdppercapita	0.368***	0.241***	0.141**	0.082	0.015
	(0.071)	(0.043)	(0.059)	(0.080)	(0.107)
o.lgdp2	0.000	0.000	0.000	0.000	0.000
	(0.102)	(0.059)	(0.075)	(0.099)	(0.132)
linternet	-0.045	-0.024	-0.007	0.003	0.014
	(0.029)	(0.018)	(0.021)	(0.028)	(0.037)
lide	0.008	0.005	0.003	0.002	0.001
	(0.018)	(0.010)	(0.013)	(0.017)	(0.023)
ltradeopenness	-0.051	-0.036	-0.023	-0.016	-0.008
	(0.054)	(0.031)	(0.039)	(0.052)	(0.070)
lelectricity	-0.082	-0.123**	-0.156**	-0.175*	-0.197
	(0.092)	(0.055)	(0.068)	(0.090)	(0.120)
linfrastructures	-0.104	-0.062	-0.029	-0.010	0.012
	(0.076)	(0.046)	(0.056)	(0.074)	(0.099)
Laid_for_trade	0.013	0.006	0.000	-0.003	-0.007
	(0.012)	(0.007)	(0.009)	(0.012)	(0.016)
Comments	128	128	128	128	128

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A5: Quantile Regressions of Agricultural Value Added on Income Inequality

Quantiles	*Q10*[th]	*Q25*[th]	*Q50*[th]	*Q75*[th]	*Q90*[th]
Variables	gini	gini	gini	gini	gini
lagri_forestry	-0.062	-0.044	-0.020	0.002	0.014
	(0.057)	(0.041)	(0.026)	(0.029)	(0.037)
lgdppercapita	0.315***	0.293***	0.264***	0.238***	0.223***
	(0.008)	(0.005)	(0.004)	(0.003)	(0.005)
o.lgdp2	0.000	0.000	0.000	0.000	0.000
	(0.079)	(0.057)	(0.036)	(0.040)	(0.052)
linternet	-0.046**	-0.039***	-0.030***	-0.022**	-0.017
	(0.021)	(0.015)	(0.010)	(0.011)	(0.014)
lide	-0.012	-0.011	-0.009	-0.007	-0.006
	(0.012)	(0.009)	(0.006)	(0.006)	(0.008)
ltradeopenness	-0.053	-0.042	-0.027	-0.014	-0.006

Quantiles	Q10[th]	Q25[th]	Q50[th]	Q75[th]	Q90[th]
	(0.054)	(0.039)	(0.025)	(0.028)	(0.036)
lelectricity	-0.046	-0.061	-0.082***	-0.101***	-0.111***
	(0.053)	(0.038)	(0.024)	(0.027)	(0.034)
linfrastructures	-0.152	-0.133*	-0.108**	-0.085*	-0.072
	(0.099)	(0.071)	(0.045)	(0.050)	(0.065)
Laid_for_trade	0.018	0.016*	0.013**	0.010*	0.009
	(0.012)	(0.008)	(0.005)	(0.006)	(0.008)
Comments	184	184	184	184	184

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A6: Quantile regressions of industrial value added on income inequality

Quantiles	Q10[th]	Q25[th]	Q50[th]	Q75[th]	Q90[th]
Variables	gini	gini	gini	gini	gini
lindustry	-0.017	-0.025	-0.035*	-0.044*	-0.051
	(0.042)	(0.029)	(0.021)	(0.025)	(0.033)
lgdppercapita	0.369***	0.348***	0.322***	0.298***	0.282***
	(0.006)	(0.004)	(0.003)	(0.003)	(0.005)
o.lgdp2	0.000	0.000	0.000	0.000	0.000
	(0.067)	(0.047)	(0.033)	(0.040)	(0.053)
linternet	-0.049***	-0.042***	-0.034***	-0.026**	-0.021
	(0.018)	(0.012)	(0.009)	(0.011)	(0.014)
lide	-0.012	-0.010	-0.008	-0.006	-0.004
	(0.010)	(0.007)	(0.005)	(0.006)	(0.008)
ltradeopenness	-0.036	-0.030	-0.022	-0.015	-0.010
	(0.043)	(0.030)	(0.021)	(0.026)	(0.034)
lelectricity	-0.037	-0.056*	-0.080***	-0.102***	-0.117***
	(0.042)	(0.030)	(0.021)	(0.025)	(0.034)
linfrastructures	-0.137	-0.121**	-0.103**	-0.086*	-0.074
	(0.085)	(0.060)	(0.042)	(0.051)	(0.068)
Laid_for_trade	0.014	0.012*	0.010*	0.007	0.006
	(0.010)	(0.007)	(0.005)	(0.006)	(0.008)
Comments	184	184	184	184	184

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A7: Quantile regressions of value chains on gender inequality

Quantiles	Q10[th]	Q25[th]	Q50[th]	Q75[th]	Q90[th]
Variables	gii	gii	gii	gii	gii
position	0.090	0.108	0.134*	0.156	0.174
	(0.154)	(0.109)	(0.081)	(0.113)	(0.161)
lgdppercapita	-0.065***	-0.055***	-0.041***	-0.029***	-0.019***
	(0.003)	(0.002)	(0.002)	(0.002)	(0.004)
o.lgdp2	0.000	0.000	0.000	0.000	0.000
	(0.028)	(0.020)	(0.014)	(0.020)	(0.029)
linternet	0.004	0.002	0.001	-0.001	-0.002
	(0.010)	(0.007)	(0.005)	(0.007)	(0.010)
lide	-0.001	0.002	0.005*	0.009**	0.011**
	(0.005)	(0.004)	(0.003)	(0.004)	(0.006)
ltradeopenness	-0.002	-0.004	-0.008	-0.011	-0.014
	(0.018)	(0.013)	(0.010)	(0.013)	(0.019)
lelectricity	-0.047	-0.047**	-0.047***	-0.047**	-0.047
	(0.029)	(0.021)	(0.015)	(0.021)	(0.030)
linfrastructures	0.031	0.027	0.022*	0.018	0.014
	(0.023)	(0.017)	(0.012)	(0.017)	(0.024)
Laid_for_trade	-0.005	-0.007	-0.009***	-0.011**	-0.013**
	(0.006)	(0.004)	(0.003)	(0.004)	(0.006)
Comments	108	108	108	108	108

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A8: Regressions by quantiles of agricultural value added on inequalities of

Quantiles	Q10th	Q25 th	Q50 th	Q75 th	Q90 th
Variables	gii	gii	gii	gii	gii
lagri_forestry	0.010	0.011	0.014	0.017	0.020
	(0.015)	(0.013)	(0.009)	(0.014)	(0.021)
Inter_position_gii	0.667***	0.672***	0.684***	0.698***	0.711***
	(0.079)	(0.069)	(0.052)	(0.075)	(0.114)
lgdppercapita	0.006***	0.006***	0.008***	0.010***	0.012***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)
o.lgdp2	0.000	0.000	0.000	0.000	0.000
	(0.014)	(0.012)	(0.009)	(0.013)	(0.019)
linternet	0.004	0.005	0.005*	0.006	0.007
	(0.004)	(0.004)	(0.003)	(0.004)	(0.006)
lide	0.002	0.003	0.004**	0.006**	0.007*
	(0.003)	(0.002)	(0.002)	(0.003)	(0.004)
ltradeopenness	0.009	0.007	0.002	-0.004	-0.010
	(0.008)	(0.007)	(0.005)	(0.008)	(0.012)
lelectricity	-0.008	-0.011	-0.019	-0.027	-0.035
	(0.018)	(0.015)	(0.011)	(0.017)	(0.025)
linfrastructures	-0.017*	-0.017**	-0.016**	-0.015	-0.014
	(0.010)	(0.009)	(0.006)	(0.009)	(0.014)
Laid_for_trade	-0.005*	-0.005**	-0.004**	-0.004	-0.004
	(0.003)	(0.002)	(0.002)	(0.003)	(0.004)
Comments	108	108	108	108	108

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1