



How Global Value Chain Participation Can Influence Gender Inequality: Evidence From Latin America And The Caribbean

Tran Thi Minh Hien, International School, Vietnam National University, Hanoi, Vietnam

Nguyen Tra My (corresponding author), International School, Vietnam National University, Hanoi, Vietnam
Corresponding email: mynt@vnuis.edu.vn

Abstract

Research purpose:

This research explores how participation in Global Value Chains (GVCs) impacts gender inequality in Latin America and the Caribbean (LAC) while identifying potential influencing pathways.

Research motivation:

Persistent gender disparities across LAC highlight the need for research on the role of GVC participation in shaping gender equality outcomes in the region.

Research design, approach, and method:

Using panel data spanning 1990–2015, this study assesses the impact of GVC engagement on gender inequality through Ordinary Least Squares (OLS) and fixed-effects regression analyses. Data on GVCs is sourced from the WITS-Eora database, while gender inequality metrics include labor force participation, life expectancy, and secondary school enrollment from the World Bank. The approach controls for country-specific economic, infrastructural, and institutional characteristics to isolate the effects of GVC participation.

Main findings:

Engagement in GVCs is associated with reduced gender inequality, evidenced by increased female participation in the labor force, higher life expectancy, and improved educational attainment. These positive outcomes are observed across agricultural, manufacturing, and service sectors and are linked to factors such as capital stock growth and legislative advancements supporting women's rights.

Practical/ managerial implications:

The study highlights meaningful policy implications, suggesting that GVCs can be leveraged to promote gender equity. It emphasizes the need for targeted investments in infrastructure and legal reforms that support women's rights to maximize the benefits of global economic integration.

Keywords: GVC participation, gender inequality, regional analysis

1. Introduction

Global Value Chains (GVCs) have significantly reshaped the global economy, with multinational corporations increasingly relying on a network of suppliers across various countries. As of 2022, GVCs accounted for nearly 70% of global trade, underscoring their crucial role in economic integration and growth (World Trade Organization, 2023). This substantial share highlights the importance of understanding how the impacts of GVC participation can extend beyond economic growth to influence social outcomes, including gender inequality. Despite the growing interest in GVCs, there remains a significant gap in research focusing on how these economic networks affect gender equality, particularly in emerging economies (Bamber and Gereffi, 2021).

The relationship between GVC participation and gender inequality is particularly critical as it provides insights into how global economic integration influences gender disparities in labor markets, education, and health (Gereffi, 2019). For instance, GVCs can drive economic growth and create new job opportunities, which can either reduce or exacerbate gender inequalities depending on how these opportunities are distributed (ILO, 2022). Addressing gender inequality is not only a matter of social justice but also crucial for maximizing economic potential; reducing gender disparities can enhance productivity, foster innovation, and contribute to more inclusive economic development (World Bank, 2023). This paper investigates how participation in Global Value Chains (GVCs) affects gender inequality in Latin America and the Caribbean (LAC), with a focus on enhancing women's labor force participation, life expectancy, and secondary school enrollment. Beyond examining GVC participation overall, this study analyzes backward and forward linkages and dissects GVC metrics by sector, specifically agriculture, manufacturing, and services. The research also explores mechanisms that drive the relationship between GVCs and gender inequality, aiming to deepen understanding of how global economic integration can foster gender equality and support socio-economic development in the region.

This paper makes three key contributions to existing literature. Firstly, it provides an extensive, multi-country analysis of GVC impacts on gender inequality in LAC, contrasting with single-country studies by offering a broader perspective across varied socio-economic settings. The LAC region provides a valuable context for this research due to its significant GVC involvement and persistent gender inequality issues.

LAC's integration into GVCs is substantial, with major sectors such as manufacturing, agriculture, and services closely linked to global supply chains. By 2023, LAC represented around 6% of global GVC trade (UNCTAD, 2024). Despite this strong GVC involvement, gender disparities remain marked: women's labor force participation, at approximately 50%, lags behind men's rate of 76% (World Bank, 2024). Education levels show similar gaps, with only 56% of women completing secondary education compared to 62% of men (UNESCO, 2023). This study aims to address these enduring gender inequalities by examining how GVC participation could help narrow these socio-economic divides.

Second, in contrast to the predominant focus of previous research on micro-level studies of specific industries, this paper adopts a macro-level approach by performing cross-country analyses. While micro-level studies provide valuable insights into individual sectors, they often lack broader applicability. By examining the effects of GVC participation on gender inequality across different countries, this research aims to provide a more holistic understanding of the issue. This macro-level perspective enables a broader assessment of how GVCs impact gender equality on a regional scale, extending beyond the confines of industry-specific findings and offering more generalizable insights into the relationship between global economic integration and gender disparities.

Finally, this study explores the mechanisms through which GVC participation influences gender inequality within a quantitative framework. Previous research has often been limited to descriptive analyses or qualitative assessments, lacking a rigorous quantitative examination of underlying mechanisms. By utilizing a robust quantitative approach, this paper investigates how factors such as physical capital accumulation, technological advancements, and improvements in domestic legislation related to women's rights drive changes in gender inequality. This exploration provides a deeper understanding of how GVCs contribute to gender equality, offering actionable insights for policymakers and stakeholders aiming to leverage economic integration as a tool for promoting gender equity.

This study aligns with Sustainable Development Goal 5 (SDG 5), which aims to achieve gender equality and empower all women and girls. By examining how GVC participation influences gender inequality in LAC, this research contributes to the broader goal of SDG 5 by identifying mechanisms through which economic integration can promote gender equity. Specifically, it explores improvements in labor force participation, life expectancy, and educational attainment for women, providing actionable insights that can support policy interventions aimed at closing gender gaps and fostering a more equitable and sustainable economic future.

The rest of the paper is structured as follows. Section 2 provides the theoretical framework and literature review. Section 3 provides data description. Section 4 describes empirical models. Section 5 presents the results and Section 6 concludes.

2. Theoretical Framework and Literature Review

2.1 Theoretical Framework

This study examines the relationship between gender inequality and GVC participation through the lens of traditional international trade theories by Ricardo and Heckscher-Ohlin (H-O). Ricardo's model of comparative advantage suggests

that countries should specialize in producing goods with lower opportunity costs, promoting efficient global resource allocation and economic growth. In GVCs, different production stages occur across various countries, each specializing based on comparative advantages influenced by factors like labor costs, skill levels, and technology. The H-O model posits that countries export goods utilizing their abundant factors of production and import goods requiring their scarce factors, predicting that trade increases returns to abundant factors and decreases returns to scarce ones.

These theories have significant implications for gender inequality. According to the Ricardian model, many developing countries have a comparative advantage in labor-intensive sectors such as textiles, apparel, and electronics assembly. In line with the H-O model, developing countries with abundant low-skilled labor often focus on these sectors within GVCs. These sectors typically employ a large number of women, suggesting that GVC participation can create job opportunities for women in labor-intensive industries, potentially reducing gender inequality in employment (Barrientos, 2019). These theories predict that GVC participation should decrease gender inequality.

2.2 Literature Review

The impact of GVC participation on gender inequality has been widely debated in academic literature, with empirical evidence presenting mixed outcomes. On one hand, several studies suggest that GVC participation can contribute to reducing gender inequality by increasing employment opportunities for women, particularly in sectors where they have traditionally been underrepresented. For instance, Maertens and Swinnen (2012) and Said-Allsopp and Tallontire (2014) highlight the positive effects of GVC participation in the agricultural sector. Their studies demonstrate that women's involvement in agricultural GVCs has led to an increase in paid employment opportunities and higher wages. This, in turn, has improved women's well-being and enhanced their intra-household bargaining power, allowing them to exert greater influence over household decisions. Similarly, Kucera and Tejani (2014) found that trade openness, which is often associated with GVC participation, has been instrumental in increasing female employment in the manufacturing sector, particularly in medium-low technology intensity industries. The expansion of GVCs in the service sector has also been beneficial for women, as evidenced by Chant and McIlwaine (2016) and Freeman (2010). Their research shows that women's participation in service sector GVCs, such as call centers and IT services, has not only provided better wages but also improved job security and professional development opportunities.

However, the positive impacts of GVC participation on gender inequality are not universal. Other studies indicate that GVCs can exacerbate existing gender inequalities, particularly when women are relegated to lower-skilled, lower-waged positions with poor working conditions. Campos-Romero and Blanco-Varela (2023) observed that in higher technology sectors, GVC participation has often widened the gender gap, as women are more likely to be confined to less skilled and lower-paid jobs. This dynamic has the potential to reinforce gender inequality, especially in industries where higher-level positions are dominated by men. Similarly, Bataka (2024) found that while educated women have been able to benefit from the opportunities presented by GVC participation, those without sufficient education are frequently limited to lower-paying roles. This perpetuates gender disparities within the workforce. Furthermore, Roll, Semyonov, and Mandel (2022) emphasize that the increase in female labor force participation resulting from globalization and GVCs does not necessarily translate to equitable opportunities for advancement into higher-level, more secure positions, thus maintaining existing gender hierarchies in the labor market.

These contrasting findings underscore the complexity of the relationship between GVC participation and gender inequality, suggesting that while GVCs can offer significant opportunities for improving women's economic status, they can also reinforce existing disparities if not accompanied by supportive policies and practices aimed at promoting gender equity.

3. Data

3.1 GVC Data

The GVC data for this study is drawn from the WITS-Eora Global Value Chain database, which provides extensive metrics on global value chains from 1990 to 2015. This database offers detailed insights that enable an in-depth analysis of a country's integration into global production networks. In this paper, three primary indicators are used: GVC-related trade as a percentage of total trade (GVC as % of trade), pure forward GVC participation as a percentage of trade (FGVC as % of trade), and pure backward GVC participation as a percentage of trade (BGVC as % of trade).

The main measure, GVC-related trade as a percentage of gross trade (GVC as % of trade), represents the share of a country's or sector's total trade (exports and imports combined) that is involved in global value chains. This metric indicates how integrated a country's trade is within international production networks, whether through importing inputs for

processing and export or exporting components for foreign assembly. It is calculated by combining the domestic value-added in exports that cross borders multiple times (forward linkages) and foreign value-added embedded in exports (backward linkages), divided by total gross trade, highlighting the portion of trade linked to GVCs.

In addition to the main GVC measure, we use separate forward and backward linkage indicators. Pure forward GVC participation (GVC PF) as a percentage of trade (FGVC as % of trade) measures the domestic value-added in a country's

exports that is further processed or used as inputs in other countries before reaching the end consumer. This metric reflects a country's participation in "downstream" activities within GVCs, such as branding, marketing, design, or final assembly, and is calculated by dividing the domestic value-added exported and further processed elsewhere by the total gross trade. Pure backward GVC participation (GVCBP) as a percentage of trade (BGVC as % of trade) measures the foreign value-added incorporated into a country's exports, representing imported components and materials used in production. This metric captures the country's involvement in the "upstream" stages, such as sourcing raw materials or technology for production.

Beyond these three main measures, similar metrics are broken down by sector—Agriculture (AgriGVC), Manufacturing (ManufGVC), and Services (ServiceGVC)—allowing a more detailed look at GVC participation across industries. Sector-specific backward and forward linkages are also examined, with AgriBGVC and AgriFGVC indicating backward and forward GVC participation in agriculture, ManufBGVC and ManufFGVC in manufacturing, and ServiceBGVC and ServiceFGVC in services, providing a more precise analysis of GVC involvement within each industry.

3.2 Gender Inequality Data

This research measures gender inequality comprehensively by examining three key dimensions: employment, health, and education, with data sourced from the World Bank's World Development Indicators database.

For employment, the study uses the female-to-male labor force participation rate ratio (LFPRRatio), which represents the proportion of the 15-64 age population that is economically active. A higher LFPRRatio suggests lower gender inequality. In health, the study examines the female-to-male life expectancy at birth ratio (LifeExpectancyRatio), which reflects the expected years a newborn would live if current mortality rates remain constant throughout their life. A higher LifeExpectancyRatio also indicates reduced gender inequality. For education, the research uses the female-to-male ratio in secondary school enrollment (SecondaryEnrollRatio), measured by the gross enrollment ratio, which compares total enrollment to the population of the relevant age group for secondary education. Here, too, a higher SecondaryEnrollRatio signals less gender inequality.

3.3 Supplementary Data

This study also considers the economic, infrastructure, and institutional characteristics of the countries examined, with data sourced from the World Bank's World Development Indicators (WDI) database.

For economic factors, the study includes real GDP per capita, inflation rate, population growth rate, net foreign direct investment (FDI) as a share of GDP, industry value added as a percentage of GDP, and the trade-to-GDP ratio (total exports and imports as a share of GDP).

To account for infrastructure, the analysis includes metrics such as population internet usage (the percentage of individuals who accessed the internet within the last three months), access to basic water services (the proportion of the population using at least basic water services), and access to electricity (the percentage of the population with electricity access).

Finally, institutional quality is measured through the Democracy Score, derived from the Polity5 Project, which categorizes government types on a scale from +10 (indicating a fully democratic regime) to -10 (indicating a strongly autocratic regime).

3.4 Sample Description

Our estimation sample is a country-year panel data consisting of 28 countries over the 1990-2015 period. The main focus is on countries in LAC. The list of countries is provided in Table A2 in the appendix. Table 1 provides the descriptive statistics for the variables used in this study.

Table 1: Descriptive Statistics

	LAC (Latin America & the Caribbean)		
	Mean	SD	N
	(1)	(2)	(3)
Panel A: GVC Metrics			
GVC as % of trade	32.713	8.164	780
FGVC as % of trade	14.289	5.465	780
BGVC as % of trade	15.142	6.611	780
AgriGVC	31.143	13.672	767
AgriFGVC	18.066	9.86	767
AgriBGVC	10.337	8.895	767
ManufGVC	34.803	10.697	779
ManufBGVC	18.404	8.046	779
ManufFGVC	12.474	5.736	779

ServiceGVC	27.353	7.685	775
ServiceFGVC	13.984	4.761	775
ServiceBGVC	11.096	5.204	775
Panel B: Gender Inequality Metrics			
LFPRRatio	0.665	0.125	992
LifeExpectancyRatio	1.006	0.184	1,302
SecondaryEnrollRatio	0.951	0.077	751
Panel C: Economic, Infrastructure, and Institutional Metrics			
GDP per capita	11,465	12,316.84	1,208
Inflation	24.244	267.212	1,035
PopGrowthRate	1.193	1.166	1,386
Net FDI to GDP	11.571	77.844	1,129
Value Added Industry GDP	24.689	9.846	1,187
GDP Trade Ratio	79.954	63.517	918
Population Internet Usage	25.935	27.313	1,175
Population Water Access	93.807	6.92	892
Population Electricity Access	92.151	12.21	1,238
Democracy Score	6.625	3.915	696

Note: LFPRRatio refers to the ratio of female labor force participation rate to male labor force participation rate. LifeExpectancyRatio refers to the ratio of the number of years a female newborn infant would live, if prevailing patterns of mortality at the time of its birth were to remain the same throughout its life, to the number of years a male newborn infant would live under the same conditions. SecondaryEnrollmentRatio refers to the ratio of the female gross enrollment rate in secondary education (total enrollment regardless of age) to the male gross enrollment rate, relative to the population of the age group that officially corresponds to this level of education.

Table 1 reveals notable differences in GVC participation and gender inequality within the LAC region. The data indicates moderate GVC participation, averaging 32.713% of trade, with a relatively balanced distribution between forward and backward participation. This suggests potential for further integration into global production networks. Sector-specific GVC involvement varies, with manufacturing showing the highest participation.

Gender inequality persists in the region, as evidenced by the Labor Force Participation Rate Ratio of 0.665, although near parity in secondary education enrollment is a positive sign. Economic indicators demonstrate significant disparities within LAC, with a wide range in GDP per capita and highly volatile inflation rates, pointing to economic instability in some countries. Infrastructure presents a mixed picture, with high access to basic utilities like water and electricity, but lagging internet usage, indicating a digital divide. The region shows moderate levels of democratic governance on average, but with considerable variation across countries. These observations highlight the complex interplay of economic development, gender equality, and global economic integration in the LAC region, underscoring areas of progress as well as persistent challenges that require attention for sustainable and inclusive growth.

4. Econometric Model

To explore how GVC participation affects gender inequality in LAC, we first employ the OLS model given in following equation:

$$\text{GenderInequality}_{it} = \alpha_0 + \alpha_1 \text{GVC}_{it} + \text{Economic}'_{it} \Pi_1 + \text{Infrastructure}'_{it} \Pi_2 + \text{Institution}_{it} \Pi_3 + \varepsilon_{it} \quad (1)$$

In this model, **GenderInequality**_{it} measures gender inequality for country *i* in year *t*. Here, gender inequality is measured by the female-male ratio in labor force participation rate, the female-male ratio in the life expectancy at birth ratio and the female-male ratio in secondary school enrollment rate. The key explanatory variable, **GVC**_{it}, represents various GVC participation measures for country *i* in year *t*, as indicated in Panel A of Table 1.

The vector **Economic'**_{it} comprises economic control variables for country *i* in year *t*, including GDP per capita, inflation, population growth rate, net FDI to GDP ratio, value-added in industry as a percentage of GDP, and trade to GDP ratio. In **Infrastructure'**_{it} represents infrastructure variables include the percentage of the population with access to the internet, water, and electricity. **Institution**_{it} represents the quality of institutions in country *i* in year *t*, proxied by the Democracy Score. The error term ε_{it} accounts for unexplained variations in the model.

The coefficient of interest is α_1 which summarizes how GVC participation affects gender inequality. In equation (1), our empirical models leverages the variation in GVC participation across countries to estimate the impact on gender inequality. However, there can be unobserved country-specific heterogeneity that could simultaneously affect both GVC participation and gender inequality. For instance, some countries might have more progressive culture which supports gender equality and the more progressive culture might enable the country to embrace globalization and integration into the global production networks. Another example is the suitability of land for agriculture which can impact the economic activities of a country and the roles men and women play in these activities, influencing gender inequality and

GVC participation. Another case in point is long-established trade routes and historical trade relationships which can shape contemporary economic structures and GVC participation, as well as social norms and gender roles. If that is the case, α_1 reflects the effect of culture, agricultural suitability, and historical trade patterns rather than GVC participation. To overcome the empirical challenges posed by those country-specific time-invariant confounders, we make the within-country comparison in the following country fixed effects regression framework as follows,

$$\text{GenderInequality}_{it} = \alpha_0 + \alpha_1 \text{GVC}_{it} + \text{Economic}'_{it}\Pi_1 + \text{Infrastructure}'_{it}\Pi_2 + \text{Institution}_{it}\Pi_3 + \theta_i + \delta_t + \varepsilon_{it} \quad (2)$$

where θ_i and δ_t stand for country fixed effects and year fixed effects, respectively. Year fixed effects account for macro trends affecting all countries. Our main identification hinges upon the within-country variation in GVC participation, as indicated by the country fixed effects θ_i in equation (2), rather than the between-country variation in equation (1). The country fixed effects account for unobserved country-specific time-invariant factors jointly affecting both GVC participation and gender inequality, such as

culture, agricultural suitability, and historical trade patterns as discussed above. Therefore, α_1 in equation (2) allows us to isolate the impacts of GVC participation on gender inequality. In other words, the fixed effects model in equation (2) can lead to an unbiased estimate of the effect of GVC participation on gender inequality. The fixed effects model has been extensively employed in empirical studies to uncover causal impacts at the country level (Nguyen and Su, 2021; Bataka, 2024).

5. Results

5.1 OLS Results

Table 2: OLS Results for overall GVC, forward and backward GVC

	LAC (Latin America & the Caribbean)		
	(1) LFPR Ratio	(2) Life Expectancy Ratio	(3) SecondaryEnroll Ratio
Panel A: GVC-related trade % gross trade			
GVC_perc	-0.001 (0.001)	0.007*** (0.002)	-0.000 (0.001)
Obs	299	299	221
Panel B: Pure forward GVC % trade and Pure backward GVC % trade			
BGVC_perc	-0.006*** (0.001)	0.005** (0.002)	-0.001 (0.002)
FGVC_perc	0.002** (0.001)	0.011*** (0.002)	-0.001 (0.002)
Obs	299	299	221

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in parentheses. In each analysis, factors related to economic progress, infrastructure, and institutional features were taken into account to isolate the effects of the main variables of interest. These control variables included GDP per capita, inflation rate, population growth, foreign direct investment inflow, trade openness, industrial value added, access to internet, electricity, and clean drinking water, as well as a measure of democratic governance.

Panel A reveals that a 10% increase in total GVC participation does not significantly affect employment or education inequality. However, it significantly decreases health inequality, specifically raises the female-male ratio of life expectancy by 7 percentage points. This finding suggests that while greater GVC involvement might not impact disparities in employment and education, it could improve health inequality.

Panel B indicates a clear distinction between the effects of backward and forward GVC participation. While the impacts of backward GVC participation is not quite clear from the OLS regressions, participation in the forward linkage is positively associated with female-male ratio of labor force participation rate and life expectancy. In other words, involvement in the “downstream” stages of GVCs can generate favorable gender equality outcomes in terms of employment and health. The results for sector-specific GVC participation are presented in appendix Table A1, providing suggestive evidence for the positive impacts of GVC participation in agriculture, manufacturing, and service on gender equality.

5.2 FE Results

Table 3a: FE Results for overall GVC, forward and backward GVC

	LAC (Latin America & the Caribbean)		
	(1) LFPR Ratio	(2) Life Expectancy Ratio	(3) Secondary Enroll Ratio
Panel A: GVC-related trade % gross trade			
GVC_perc	0.003*** (0.001)	0.004* (0.002)	0.002** (0.001)
Obs	299	299	221
Panel B: Pure forward GVC % trade and Pure backward GVC % trade			
BGVC_perc	0.002 (0.001)	0.008*** (0.003)	0.002** (0.001)
FGVC_perc	0.011*** (0.002)	-0.005 (0.006)	0.007*** (0.003)
Obs	299	299	221

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in parentheses. In each analysis, factors related to economic progress, infrastructure, and institutional features were taken into account to isolate the effects of the main variables of interest. These control variables included GDP per capita, inflation rate, population growth, foreign direct investment inflow, trade openness, industrial value added, access to internet, electricity, and clean drinking water, as well as a measure of democratic governance. Additionally, variations across countries and over time were accounted for in the model.

The fixed effects (FE) estimates of how GVC participation influences gender inequality are presented in Table 3a. This model serves as the primary specification because it accounts for unobserved heterogeneity specific to each country. Panel A shows that deeper integration into global production networks improves all measures of gender equality. Specifically, a 10% increase in total GVC participation correlates with a 3-percentage-point rise in the female-to-male employment ratio (Column 1), a 4-percentage-point increase in the female-to-male life expectancy ratio (Column 2), and a 2-percentage-point increase in the female-to-male secondary school enrollment ratio (Column 3). All estimates are statistically significant. Compared to the cross-country analysis in Table 2, the within-country comparisons in Table 3, which account for country-specific confounders, offer a clearer and more consistent view of GVC participation's effects on gender equality across various dimensions. These results align with Kummritz, Taglioni, and Winkler's (2017) findings, which highlight the role of GVC participation in improving health outcomes and reducing gender disparities.

Panel B highlights the differing impacts of backward and forward GVC participation. Backward GVC participation significantly improves gender equality in health and education (Columns 2 and 3), while forward GVC participation reduces gender disparities in employment and education (Columns 1 and 3). The FE estimates for forward GVCs are larger and more statistically significant than those from OLS models. Notably, a 10% increase in forward GVC participation is linked to an 11-percentage-point rise in the female-to-male labor force participation ratio and a 7-percentage-point increase in the female-to-male secondary school enrollment ratio (Columns 1 and 3). For backward GVC participation, a 10% increase corresponds to an 8-percentage-point rise in the female-to-male life expectancy ratio and a 2-percentage-point increase in the female-to-male secondary school enrollment ratio (Columns 2 and 3). By addressing country-specific unobserved factors, these estimates reveal the positive effects of both forward and backward GVC participation.

Table 3b provides the FE estimates for the impacts of sector-specific GVC participation on gender equality. Agricultural GVCs positively influence the female-to-male life expectancy ratio (Panel A), while manufacturing and service GVCs enhance gender equality across multiple dimensions (Panels B and C). A 1% increase in manufacturing GVC participation leads to a 2-percentage-point rise in both the female-to-male labor force participation ratio and the secondary school enrollment ratio (Panel B). Similarly, a 1% increase in service GVC participation results in a 5-percentage-point increase in the female-to-male life expectancy ratio and a 1-percentage-point rise in the secondary school enrollment ratio (Panel

C). These findings underscore the critical role of integrating into global manufacturing networks in advancing gender equality. They align with Bamber and Staritz's (2016) conclusions on the potential of manufacturing GVCs to promote gender equity and emphasize the significance of agricultural value chains in improving women's status, as noted by Dolan and Sorby (2003).

Table 3b: FE Results for overall sector-specific GVC

	LAC (Latin America & the Caribbean)		
	(1) LFPR Ratio	(2) Life Expectancy Ratio	(3) Secondary Enroll Ratio
Panel A: GVC-related trade % gross trade in agriculturee industries			
AgriGVC	-0.001 (0.001)	0.005*** (0.001)	0.001 (0.001)
Obs	299	299	221
Panel B: GVC-related trade % gross trade in manufacturing industries			
ManufGVC	0.002** (0.001)	0.003 (0.002)	0.002** (0.001)
Obs	299	299	221
Panel C: GVC-related trade % gross trade in services industries			
ServiceGVC	0.001 (0.001)	0.005*** (0.001)	0.001* (0.001)
Obs	299	299	221

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in parentheses. In each analysis, factors related to economic progress, infrastructure, and institutional features were taken into account to isolate the effects of the main variables of interest. These control variables included GDP per capita, inflation rate, population growth, foreign direct investment inflow, trade openness, industrial value added, access to internet, electricity, and clean drinking water, as well as a measure of democratic governance. Additionally, variations across countries and over time were accounted for in the model.

6. Mechanism

This section explores the potential mechanisms through which GVC participation influences gender inequality. Drawing from existing research, the analysis focuses on three key pathways: technological advancements (measured by Total Factor Productivity, TFP), capital stock accumulation, and improvements in domestic legislation regarding women's rights. Technological progress, as highlighted by Kucera and Tejani (2014) and Maertens and Swinnen (2012), significantly shapes labor markets and affects gender outcomes. Similarly, Freeman (2010) and Chant and McIlwaine (2016) discuss how economic growth and capital investment can have gendered impacts. Additionally, advancements in women's rights legislation, as emphasized by Roll, Semyonov, and Mandel (2022) and Campos-Romero and Blanco-Varela (2023), play a crucial role in promoting gender equality. These pathways collectively provide insight into how GVC participation might either alleviate or worsen gender inequality across regions.

In Latin America and the Caribbean (LAC), GVC participation often drives technological spillovers and learning-by-doing, enhancing TFP as firms adopt advanced technologies and practices from international partners (Lopez-Córdova and Rodriguez-Clare, 2009; Lederman et al., 2010). This increased productivity generates high-skilled job opportunities for women, particularly in sectors such as IT, pharmaceuticals, and automotive manufacturing, which are central to the region's GVCs. These industries offer more equitable employment prospects for women, helping to narrow gender gaps in skills and earnings (Fernandes and Paunov, 2012; Blázquez and Santillán, 2019).

GVC participation also attracts foreign direct investment (FDI), as multinational corporations integrate local firms into their supply chains. This capital inflow boosts physical capital accumulation, enhances infrastructure, and drives economic growth, creating more employment opportunities for women (Alfaro et al., 2004; Kose et al., 2006). Examples include the maquiladora industries in Mexico and the automotive sectors in Brazil and Argentina, where significant FDI has spurred job creation and economic activities that benefit women (Fussell, 2000; Barrientos et al., 2003).

Furthermore, GVCs often expose countries in LAC to international standards and encourage improvements in women's rights legislation (Berik et al., 2009; Barrientos & Smith, 2007). Multinational corporations bring corporate social responsibility (CSR) practices that prioritize gender equality, influencing local firms and policymakers to adopt similar approaches. This can result in domestic policies promoting equal pay, maternity leave, protection against discrimination, and childcare support (Murillo and Schrank, 2005; Amengual and González, 2011). As multinational firms advocate for global standards, such legislative changes foster a more supportive environment for women in the workforce.

To test these pathways empirically, a fixed effects model is applied with pathway-specific variables as dependent variables. Technological progress is measured using TFP data from the Penn World Table version 10, reflecting the efficiency of input utilization in production. Physical capital accumulation is assessed using physical capital stock data from the same source. Domestic legislation improvements are evaluated using three indicators from the World Bank's Women, Business, and the Law (WBL) database: the WBL Index, the Workplace Indicator Score, and the Parenthood Indicator Score. These indicators assess legal barriers to women's economic participation, workplace protections, and support for parenthood, with scores ranging from 0 to 100.

Table 4 summarizes the results. While there is limited evidence for the role of technological progress in the GVC-gender inequality relationship (Column 1), Column 2 shows a significant positive association between GVC participation and physical capital accumulation. This suggests that increased GVC involvement contributes to higher physical capital stock, which may help reduce gender inequality by enhancing infrastructure and economic opportunities. Columns 3 and 5 reveal significant positive effects of GVC participation on the WBL Index and the Parenthood Indicator Score, indicating that GVCs are linked to improved legislation supporting women's economic participation and parenthood, such as maternity leave policies and protections for women.

In summary, the analysis identifies physical capital accumulation and improvements in women's rights legislation as key mechanisms through which GVC participation impacts gender inequality.

Table 4: Mechanisms

	TPF	Capital Stock	WBL Index	Workplace Indicator Score	Parenthood Indicator Score
	(1)	(2)	(3)	(4)	(6)
GVC	0.001 (0.003)	0.012** (0.006)	0.184* (0.131)	-0.671 (0.499)	1.273*** (0.305)
Obs	240	275	280	280	280

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in parentheses. Each regression controls for economic development, infrastructure, and institution characteristics, including GDP per capita, inflation rate, population growth, FDI inflow, trade openness, industry value added, access to internet, electricity, drinking water and democratic regime score. Country fixed effects and year fixed effects are included.

7. Conclusion

This study provides strong evidence that participation in GVCs reduces gender inequality in the LAC region. Specifically, it shows that GVC participation increases the female-to-male ratios in labor force participation, life expectancy, and secondary school enrollment. Additional analysis indicates that GVCs across agriculture, manufacturing, and services sectors all contribute to this reduction in gender inequality. These positive outcomes are linked to increased physical capital accumulation and improvements in domestic policies supporting women's rights.

The research methodology integrates the GVC database with datasets such as the UNDP gender dataset, WDI database, and WGI database to create a country-year panel. By using a country fixed effects model, the study leverages within-country variation in GVC participation while accounting for unobserved, country-specific, time-invariant factors that might influence both GVC participation and gender inequality. This methodological approach isolates the unbiased effects of GVCs on gender equality, providing a causal interpretation of the relationship.

The findings have important policy implications. Policymakers are encouraged to promote deeper integration into GVCs, as this can significantly enhance gender equality. Encouraging FDI and supporting industries with strong GVC links can create more high-skilled job opportunities for women, thereby reducing labor market disparities (Blázquez and Santillán, 2019; Fernandes and Paunov, 2012; Lopez-Córdova and Rodríguez-Clare, 2009).

Efforts to increase physical capital accumulation are also critical, as this is a key mechanism through which GVCs improve gender outcomes. Investments in infrastructure, technology, and education are essential to fully capitalize on the

benefits of GVC participation. For instance, enhancing transportation and communication infrastructure can better integrate remote areas into GVCs, providing more employment opportunities for women in these regions (United Nations, 2020). Similarly, investing in technology and digital literacy can empower women to engage more effectively in GVCs, especially in technology-dependent sectors like manufacturing and services (OECD, 2018). These investments not only promote gender equality by increasing access to skilled jobs for women but also contribute to inclusive economic growth.

Strengthening and enforcing domestic policies that support women's rights is another priority. Measures to combat gender-based discrimination, ensure equal pay, provide maternity leave, and support childcare can amplify the benefits of GVCs for gender equality. For example, enforcing equal pay legislation can narrow the gender wage gap, making jobs in GVC-related sectors more attractive to women (ILO, 2020). Providing maternity leave and childcare support can help women manage work and family responsibilities, boosting their labor force participation. Anti-discrimination laws and fair hiring practices can ensure equal access to the job opportunities created by GVCs.

A limitation of this study is the lack of recent data, as GVC information is only available up to 2015. Despite this, the study's findings remain highly relevant. The mechanisms driving the causal relationship between GVC participation and gender inequality—such as physical capital accumulation, technological progress, and policy improvements—are likely to persist over time. These insights are applicable today, offering valuable guidance for policymakers on leveraging GVC participation to foster social equity. Furthermore, since GVC structures change gradually, the conclusions drawn from this research continue to provide critical evidence for investments in infrastructure and legal reforms to promote gender equality (Pietrobelli and Rabellotti, 2011).

8. References

- Alfaro, L., Chanda, A., Kalemli-Ozcan, S., & Sayek, S. (2004). FDI and Economic Growth: The Role of Local Financial Markets. *Journal of International Economics*, 64(1), 89-112.
- Amengual, M., & González, M. (2011). Corporate social responsibility in the context of globalization: Latin American multinational companies. *Journal of Business Ethics*, 101(3), 465-482.
- Bair, J. (2005). Global Capitalism and Commodity Chains: Looking Back, Going Forward. *Competition & Change*, 9(2), 153-180. doi:10.1179/102452905X45382
- Bamber, P., & Gereffi, G. (2021). The impact of Global Value Chains on employment in developing countries. *Journal of Economic Studies*, 48(2), 255-278.
- Bamber, P., & Staritz, C. (2016). The gender dynamics of global value chains. In K. Raworth, M. Prowse, & L. Camfield (Eds.), *Gender and work in global value chains: Capturing the gains?* (pp. 15-34). Cambridge University Press.
- Barrientos, S. (2019). *Gender and work in global value chains: Capturing the gains?* Cambridge University Press. <https://doi.org/10.1017/9781108563090>
- Barrientos, S., & Smith, S. (2007). Do workers benefit from ethical trade? Assessing codes of labour practice in global production systems. *Third World Quarterly*, 28(4), 713-729.
- Barrientos, S., Dolan, C., & Tallontire, A. (2003). A Gendered Value Chain Approach to Codes of Conduct in African Horticulture. *World Development*, 31(9), 1511-1526.
- Barrientos, S., Gereffi, G., & Rossi, A. (2011). Economic and social upgrading in global production networks: A new paradigm for a changing world. *International Labour Review*, 150(3-4), 319-340. <https://doi.org/10.1111/j.1564-913X.2011.00119.x>
- Bataka, H. (2024). Global value chains participation and gender inequalities in Sub-Saharan Africa: Importance of women education.
- Berik, G., Rodgers, Y., & Zveglic, J. (2009). Does Labor Standards Compliance Affect Foreign Direct Investment? *World Development*, 37(5), 943-954.
- Blázquez & Santillán (2019): Their study on Mexico provides empirical evidence that participation in GVCs can positively impact women's wages, suggesting that promoting GVC integration can lead to improved economic outcomes for women.
- Blázquez, M., & Santillán, A. (2019). The Effect of Global Value Chains on Women's Wages: Evidence from Mexico. *The World Economy*, 42(9), 2586-2617.
- Campos-Romero, C., & Blanco-Varela, G. (2023). The impact of gender equality policies on economic growth: Evidence from Latin America. *Journal of Economic Policy Reform*.
- Campos-Romero, H., & Blanco-Varela, B. (2023). The Reduction of the Gender Gap through Global Value Chains: Political Commitment or Perpetuation of Gender Roles? European Union (EU-27).
- Chant, S., & McIlwaine, C. (2016). *Cities, Slums and Gender in the Global South: Towards a Feminised Urban Future*. Routledge.
- Chant, S., & McIlwaine, C. (2016). *Cities, slums and gender in the global south: Towards a feminised urban future*. Routledge.

- Dolan, C. S., & Sorby, K. (2003). Gender and employment in high-value agriculture industries. Agriculture and Rural Development Working Paper No. 7. World Bank.
- Fernandes & Paunov (2012): Their research highlights the link between FDI in services and manufacturing productivity. This indicates that encouraging FDI, particularly in sectors connected to GVCs, can boost productivity and potentially create more high-skilled jobs accessible to women.
- Fernandes, A. M., & Paunov, C. (2012). Foreign direct investment in services and manufacturing productivity: Evidence for Chile. *Journal of Development Economics*, 97(2), 305-321.
- Freeman, R. B. (2010). Globalization of scientific and engineering talent: International mobility of students, workers, ideas, and the world economy. *Economics of Innovation and New Technology*, 19(5), 393-406. doi:10.1080/10438590903432871
- Freeman, R. B. (2010). Labor regulations, unions, and social protection in developing countries: Market distortions or efficient institutions? In *Handbook of Development Economics* (Vol. 5, pp. 4657-4702).
- Frenk, J. (2015). Leading the way towards universal health coverage: A call to action. *The Lancet*, 385(9975), 1352-1358. [https://doi.org/10.1016/S0140-6736\(14\)61467-7](https://doi.org/10.1016/S0140-6736(14)61467-7)
- Fussell, E. (2000). Making labor flexible: The recomposition of Tijuana's maquiladora female labor force. *Feminist Economics*, 6(3), 59-79.
- Gereffi, G. (2018). Global Value Chains and Development. doi:10.1017/9781108559423
- Gereffi, G. (2019). Global value chains and development: Redefining the contours of 21st-century capitalism. Cambridge University Press. <https://doi.org/10.1017/9781108559423>
- Hvidt, M. (2013). Economic diversification in GCC countries: Past record and future trends. *Kuwait Programme on Development, Governance and Globalisation in the Gulf States*, 27, 1-24. <https://doi.org/10.2139/ssrn.2386313>
- International Labour Organization. (2022). *World Employment and Social Outlook: Trends 2022*. Geneva: International Labour Organization.
- Kabeer, N. (2005). Gender equality and women's empowerment: A critical analysis of the third millennium development goal 1. *Gender & Development*, 13(1), 13-24. <https://doi.org/10.1080/13552070512331332273>
- Kose, M. A., Prasad, E., Rogoff, K., & Wei, S.-J. (2006). Financial globalization: A reappraisal. *IMF Staff Papers*, 56(1), 8-62.
- Kucera, D., & Tejani, S. (2014). Feminization, defeminization, and structural change in manufacturing. *World Development*, 64, 569-582.
- Kucera, D., & Tejani, S. (2014). Feminization, defeminization, and structural change in manufacturing. *World Development*, 64, 569-582. doi:10.1016/j.worlddev.2014.06.028
- Kucera, D., & Tejani, S. (2014). Feminization, defeminization, and structural change in manufacturing. *World Development*, 64, 569-582. doi: 10.1016/j.worlddev.2014.06.033
- Kummritz, V., Taglioni, D., & Winkler, D. (2017). Economic upgrading through global value chain participation: Which policies increase the value added gains? Policy Research Working Paper 8007. World Bank. <https://doi.org/10.1596/1813-9450-8007>
- Lederman, D., Maloney, W. F., & Servén, L. (2010). Productivity and the Investment Climate: What Matters Most? *The World Bank Economic Review*, 24(2), 223-252.
- Lopez-Córdova & Rodriguez-Clare (2009): This study emphasizes the role of foreign technology in enhancing wages and productivity. By facilitating deeper integration into GVCs, countries can access advanced technologies, leading to the creation of higher-skilled jobs that can benefit women.
- Lopez-Córdova, J. E., & Rodriguez-Clare, A. (2009). The Impact of Foreign Technology on Wages and Productivity. *American Economic Review*, 99(5), 1844-1877.
- Maertens, M., & Swinnen, J. (2012). Gender and modern supply chains in developing countries. *The Journal of Development Studies*, 48(10), 1412-1430. doi:10.1080/00220388.2012.663903
- Maertens, M., & Swinnen, J. (2012). Gender and modern supply chains in developing countries. *The Journal of Development Studies*, 48(10), 1412-1430. <https://doi.org/10.1080/00220388.2012.663902>
- Meinzen-Dick, R., Quisumbing, A., Doss, C., & Theis, S. (2019). Women's land rights as a pathway to poverty reduction: Framework and review of available evidence. *Agricultural Systems*, 172, 72-82. <https://doi.org/10.1016/j.agsy.2017.10.009>
- Murillo, D., & Schrank, A. (2005). With a little help from my friends: Partisan politics, transnational alliances, and labor rights in Latin America. *Comparative Political Studies*, 38(8), 971-1000.
- Nguyen, C. P., & Su, T. D. (2021). Does energy poverty matter for gender inequality? Global evidence. *Energy for Sustainable Development*, 64, 35-45.
- Pietrobelli, C., & Rabellotti, R. (2011). Global Value Chains Meet Innovation Systems: Are There Learning Opportunities for Developing Countries?. *World Development*, 39(7), 1261-1269. doi:10.1016/j.worlddev.2010.05.01
- Roll, A., Semyonov, M., & Mandel, H. (2022). Women's rights and gender equality in the context of global value chains. **Gender & Society*, 36*(2), 194-216. (<https://doi.org/10.1177/08912432211060150>)

- Roll, Y., Semyonov, M., & Mandel, H. (2022). Gendered Globalization: The Relationship between Globalization and Gender Gaps in Employment and Occupational Opportunities. Forty-seven countries around the world.
- Said-Allsopp, M., & Tallontire, A. (2014). Pathways to empowerment?: Dynamics of women's participation in Global Value Chains. Kenya (SSA).
- Staritz, C., & Reis, J. G. (2013). Global Value Chains, Economic Upgrading, and Gender. doi:10.1596/978-0-8213-9769-9
- Tejani, S., & Milberg, W. (2016). Global defeminization? Industrial upgrading and manufacturing employment in developing countries. *Feminist Economics*, 22(2), 24-54. <https://doi.org/10.1080/13545701.2015.1108991>
- United Nations Conference on Trade and Development. (2024). World Investment Report 2024: International Production Beyond the Pandemic.
- United Nations Educational, Scientific and Cultural Organization. (2023). Global Education Monitoring Report 2023
- Women, Business, and the Law. (2024). Women, Business, and the Law 2024. World Bank. <https://wbl.worldbank.org/en/reports>
- World Bank. (2023). World Development Report 2023: Trading for Development in the Age of Global Value Chains.
- World Bank. (2024). World Development Report 2024: Gender Equality and Development.
- World Trade Organization. (2023). World Trade Statistical Review 2023.

APPENDIX

Table A1: OLS Results for sector-specific GVC impact on gender inequalities

	LAC (Latin America & the Caribbean)		
	(1) LFPRRatio	(2) LifeExpectancyRatio	(3) SecondaryEnrollRatio
Panel A: GVC-related trade % gross trade in Agriculture industries			
AgriGVC	0.002** (0.001)	0.000 (0.001)	-0.003*** (0.001)
Obs	299	299	221
Panel B: GVC-related trade % gross trade in Manufacturing industries			
ManufGVC	0.000 (0.001)	0.004*** (0.001)	-0.001 (0.001)
Obs	299	299	221
Panel C: GVC-related trade % gross trade in Services industries			
ServiceGVC	0.003*** (0.001)	0.002 (0.001)	-0.001 (0.001)
Obs	299	299	221

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in parentheses. In each analysis, factors related to economic progress, infrastructure, and institutional features were taken into account to isolate the effects of the main variables of interest. These control variables included GDP per capita, inflation rate, population growth, foreign direct investment inflow, trade openness, industrial value added, access to internet, electricity, and clean drinking water, as well as a measure of democratic governance.

Table A2: List of Countries

LAC (Latin America & the Caribbean)	
Code	Country
(1)	(2)
ARG	Argentina
BHS	Bahamas
BLZ	Belize
BOL	Bolivia
BRA	Brazil
BRB	Barbados
CHL	Chile
COL	Colombia
CRI	Costa Rica
CUB	Cuba
DOM	Dominican Republic
ECU	Ecuador
GTM	Guatemala
GUY	Guyana
HND	Honduras
HTI	Haiti
JAM	Jamaica
LCA	Saint Lucia
MEX	Mexico
NIC	Nicaragua
PAN	Panama
PER	Peru
PRY	Paraguay
SLV	El Salvador
SUR	Suriname
TTO	Trinidad and Tobago
URY	Uruguay
VEN	Venezuela

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

