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Global Value Chains (GVCs) and Social Upgrading: The Role of Country's Absorptive Capacity: The Euro-Mediterranean Case

SYLVANA WAFIK¹ and ASMAA EZZAT²

¹Assistant Lecturer, University of London, the European universities, Egypt. email: silvina.wafiq2015@feeps.edu.eg; Faculty of economics and political science, Cairo university, Egypt

²Associate Professor, Faculty of Economics and Political Science, Cairo University, Egypt, email: asmaaezzat@feeps.edu.eg

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ABSTRACT

The current study examines the impacts of Global Value Chain (GVC) with its forward and backward linkages on the social upgrading process, using data from 63 countries over the period (2010–2020) with a special focus on the Euro-Mediterranean region. The paper adds to the existing literature by measuring social upgrading in terms of four aspects: working poverty, working vulnerability, labour rights and unemployment in addition to tackling the different countries absorptive capacities that might control the effectiveness of GVCs in the social upgrading process that includes innovative capacity, human capital capacity and governance capacity. Applying two stages least squares estimation, the findings show that GVC participation might lead to unequal implications, where high-skill, high-wage jobs increase while low-skill, low-wage jobs shrink, exacerbating income inequality and working poverty. However, forward GVC Improves labour wellbeing by enhancing labour rights compliance and reducing unemployment. The study highlights the role of innovation capacity and governance quality in enhancing the social upgrading effects of GVCs, where it is found that Investments in research and development promote labour rights and reduce working poverty, while strong regulatory frameworks work through enhancing labour rights and reducing vulnerability. On the other side, it highlights the challenges arising from mismatches between educational outcomes and GVC needs, which contribute to unemployment and working poverty, particularly for workers lacking the necessary skills for the global economy.

INTRODUCTION

Through the fragmentation of the production process into multiple stages across countries, GVCs have become the corner stone of modern trade. It enables countries to focus on their comparative advantages and hence turns production into specialized staged that enhance

efficiency, reduce costs, and accelerate innovation. Despite of its role in the economic upgrading in terms of economic growth and development, the implications for the social upgrading process in terms of labour wellbeing is still debatable. While GVC participation can generate employment, foster skill development, and facilitate knowledge transfer, it may also increase job insecurity and wage pressures (Bernhardt and Milberg, 2011).

In the Euro-Med, GVCs play a particularly important role in labour markets, however their benefits are unevenly distributed. Northern countries have mainly benefited from a wider employment opportunity, while the southern countries are stuck in low-wage, low-skill segments of value chains. In that regard, governments need to address these challenges by enhancing the country's competitiveness and implementing policies that promote labour rights, provide social protection, and invest in education and training to ensure that workers benefit from participation in GVCs while enhancing their wellbeing. Hence, a country's absorptive capacities including its innovation, human capital, regulatory environment, and institutional framework conditions the realization of GVCs' benefits (Gereffi and Sturgeon, 2013).

Based on this, the paper analyses the role of GVC participation in the social upgrading process over the period 2010–2020 using a panel of 63 countries and a 2SLS framework. The study contributes to the literature in two keyways. First, moving beyond the traditional focus on employment and wages, it adopts a broader definition of social upgrading consistent with the Decent Work Agenda (Sengenberger, 2001). Accordingly, labour wellbeing is examined across four dimensions: employment, working poverty, working conditions, and labour rights. Second, the paper investigates which dimensions of absorptive capacity—innovation, governance, or human capital—are most critical for maximizing the labour market benefits of GVC participation. The empirical analysis proceeds in two steps: (i) estimating the effects of GVC participation and its linkages on the four dimensions of labour wellbeing, and (ii) introducing interaction terms between GVC measures and absorptive capacity indicators.

The remainder of the paper is organized as follows. Section 1 reviews the relevant literature. Section 2 presents stylized facts on GVC participation, social upgrading, and absorptive capacity in the sample countries. Section 3 describes the data and methodology. Section 4 discusses the empirical results, and finally the conclusion and policy recommendations.

1. LITERATURE REVIEW

Recently, the production of goods and services has been distributed across countries throughout different stages. Hence, GVCs have become a dominant feature of international trade, while influencing patterns of specialization and competitiveness among countries. That is why the theoretical concerns have been shifted towards the implications of GVCs for the labour markets. Over time, these models evolved to tackle various concepts such as Fragmentation (Jones and Kierzkowski, 1990), Outsourcing (Arndt, 1996; Feenstra and Hanson, 1996; Kohler, 2001), Offshoring (Kohler, 2009; Feenstra, 2010; Baldwin and Robert-Nicoud, 2014), Trade in Tasks (Grossman and Rossi-Hansberg, 2008) and most recently, Global Value Chains (Koopman et al., 2014). Overall, GVCs in their different forms are argued to facilitate the integration of economies into global markets, enhance technological innovation and knowledge transfer, and hence productivity. At the same time, they pose challenges such as job displacement, skill mismatches, and income inequality as labour markets adjust to the process.

A large segment of literature highlights the interconnected relationship between GVC participation and labour market. While some studies suggest that participation into GVCs leads to job creation through increased demand for labour-intensive activities (Lu et al., 2024), others argue that outsourcing and offshoring may lead to employment instability and put downward pressure on wages, mainly for low-skilled workers in developing countries (Gimet et al., 2015; Banga, 2016; Pahl and Timmer, 2020). Another strand of the literature highlights that indirect relationship between GVCs and labour wellbeing, where its outcomes might depend on a country's

position along the value chain (Jessen, 2021; Szymczak and Wolszczak-Derlacz, 2022). While, from a social sustainability perspective, decentralized governance within GVCs have also been linked to poorer working conditions. Subcontracting arrangements may result in precarious employment, informalization, and violations of labour standards, especially in highly competitive, cost-driven sectors (Pegler, 2015; Pasquali, 2021; Nikulin et al., 2022; Nikulin and Wolszczak-Derlacz, 2023).

Another strand of the literature argues that the effects of GVCs are closely tied to a country's absorptive capacity. Countries with skilled labour forces, innovative environments, supportive policies, and effective institutions are better able to attract foreign investment, integrate into GVCs, and benefit from spillovers. Several studies link GVC upgrading to governance quality, institutional frameworks, and national policy contexts (Puppim de Oliveira and de Oliveira Cerqueira, 2014; Kummritz et al., 2017; Khattak et al., 2017; Korwatanasakul et al., 2020; Teipen and Mehl, 2021; Ndubuisi and Owusu, 2022; Biurrun et al., 2022; De Marchi and Alford, 2022), showing that upgrading depends on infrastructure, connectivity, investment and trade policies, institutions, education, and skills. Others refer to the role of innovation systems, where stronger public R&D investment supports export capacity, technological diversification, and access to higher-value GVC segments (Gehl and Vallejo, 2018).

While the relevance of GVCs for social upgrading in terms of wages and employment has been widely discussed, empirical evidence on their effects on labour wellbeing in a broader sense remains limited. Moreover, despite extensive research on the governance conditionality of economic upgrading, fewer studies examine how governance and other dimensions of absorptive capacity shape social upgrading outcomes. This paper contributes to the literature by focusing on labour wellbeing in its broader definition—covering employment, working poverty, labour rights, and working conditions—consistent with the ILO's Decent Work Agenda (Sengenberger, 2001). In addition, it extends the empirical framework by examining the nonlinear relationship between GVC participation and social upgrading by studying which absorptive capacity—innovation, governance, or human capital—matters most for realizing the benefits of GVCs.

2. STYLIZED FACTS

2.1 GVC

When examining GVC participation in the Euro-Mediterranean countries between 2010 and 2020, the share of GVCs in gross exports exceeds 40% for most countries in the region, highlighting the importance of GVCs in the region. In some countries, such as Malta and Luxembourg, the GVC share exceeds 60%. Overall, almost all countries in the region experienced an increase in GVC participation over the period, except for few countries such as Jordan, Sweden, and Belgium (see Figure 1).

Such increase could be linked to multiple factors shaping the international integration for the region. On one side, regional integration and trade liberalization within the European Union (EU), as well as with neighbouring Mediterranean countries, have facilitated more efficient international trade and investment, increasing the flow of intermediate goods and services. In addition, countries such as Turkey, Morocco, and Tunisia have attracted higher levels of foreign direct investment (FDI), contributing to their deeper involvement in GVCs. Finally, EU trade agreements with Mediterranean partners have further integrated the region into European and global value chains, increasing its role in global production networks (Gereffi and Sturgeon, 2013).

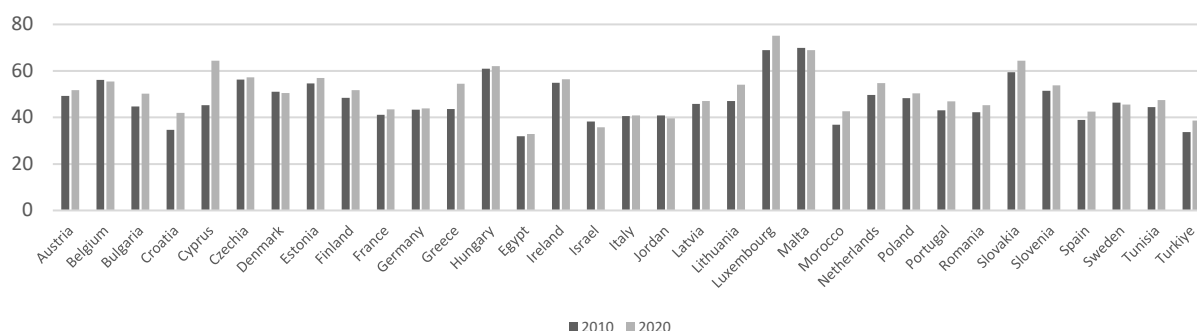


Figure 1. GVC participation as % of gross exports for Euro-Med Countries in 2010 and 2020
Source: By the author based on TIVA data base.

2.2 Labour wellbeing

Figures 2–5 shows the evolution of the different proxies of labour wellbeing in Euro-Med countries. Regarding unemployment, most countries have rates below 15%, though some, including Greece, Estonia, Jordan, Latvia, Lithuania, Spain, and Tunisia, face very high unemployment. Figure 3 shows that, for most of the sample, unemployment declined between 2010 and 2020. For the working vulnerability, it accounts for less than 30% of total employment in almost all countries, except Morocco, where it reaches nearly 50%, followed by Romania and Turkey (see figure 3).

Figure 4 shows the national compliance with labour rights within the sample countries. Labour rights are widely respected in European countries, with most scoring below 2, but compliance is weaker in Middle Eastern countries like Jordan, Morocco, and Turkey, which score above 3. Egypt performs the worst, with a score exceeding 6. However, almost all countries improved compliance between 2015 and 2020. While legal frameworks have strengthened, enforcement remains a concern, especially in sectors such as agriculture, construction, and domestic labour, where exploitation persists.

Finally, regarding working poverty, most countries have fewer than 15% of workers below the poverty line. Exceptions include Egypt, Tunisia, and Turkey, where it exceeds 20%. Figure 6 shows that working poverty increased in several countries between 2015 and 2020, including Egypt, Tunisia, Greece, Jordan, and Austria, while other countries, such as Turkey, Morocco, Bulgaria, Cyprus, and Estonia, managed to reduce it sharply.

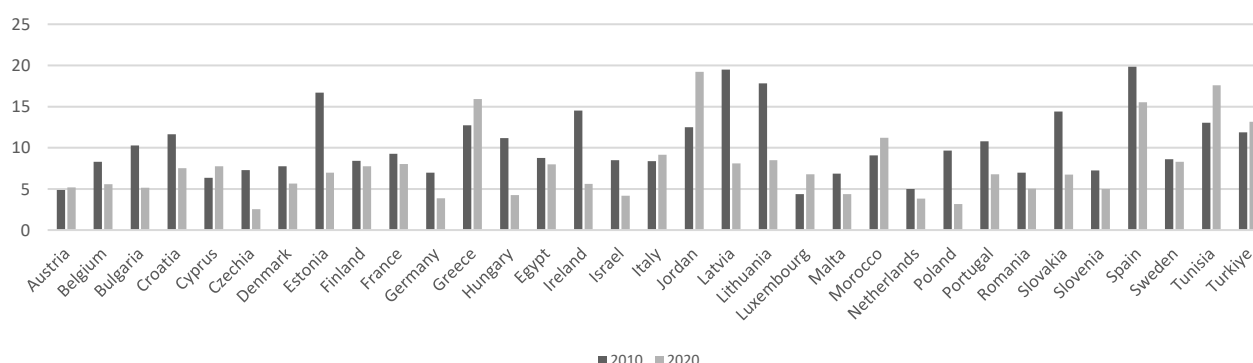


Figure 2. Unemployment as % of the total labour force for Euro-Med Countries in 2010 and 2020
Source: By the author based on ILOSTAT, ILO modelled estimates

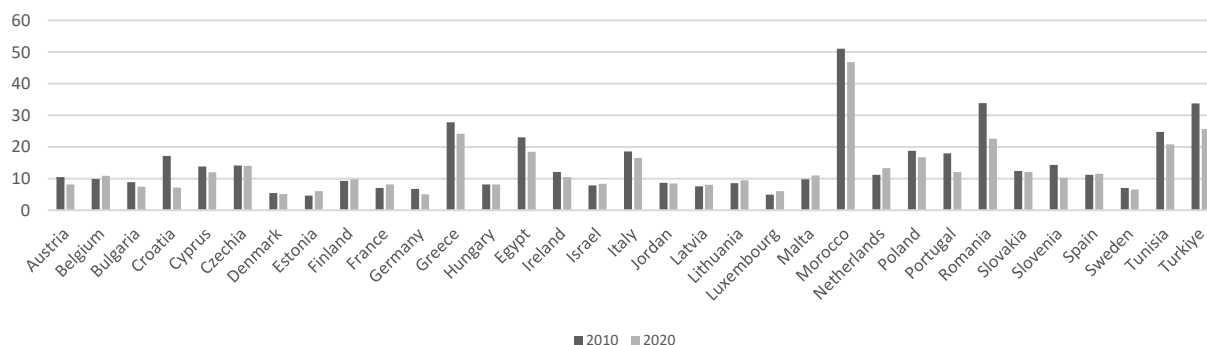


Figure 3. Working Vulnerability as % of total employment for Euro-Med Countries in 2010 and 2020
Source: By the author based on ILOSTAT, ILO modelled estimates

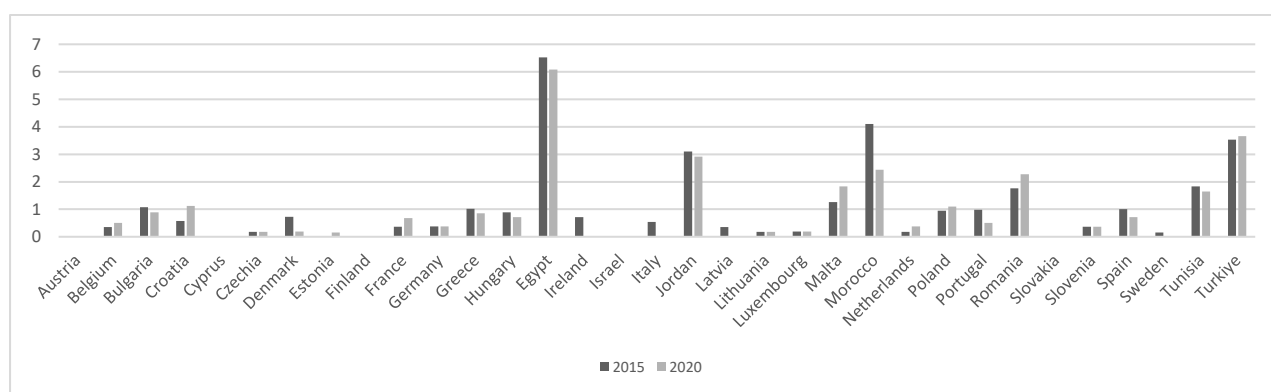


Figure 4. Score of national compliance with labour rights Index for Euro- Med Countries in 2010 and 2020
Source: By the author based on ILOSTAT, ILO modelled estimates

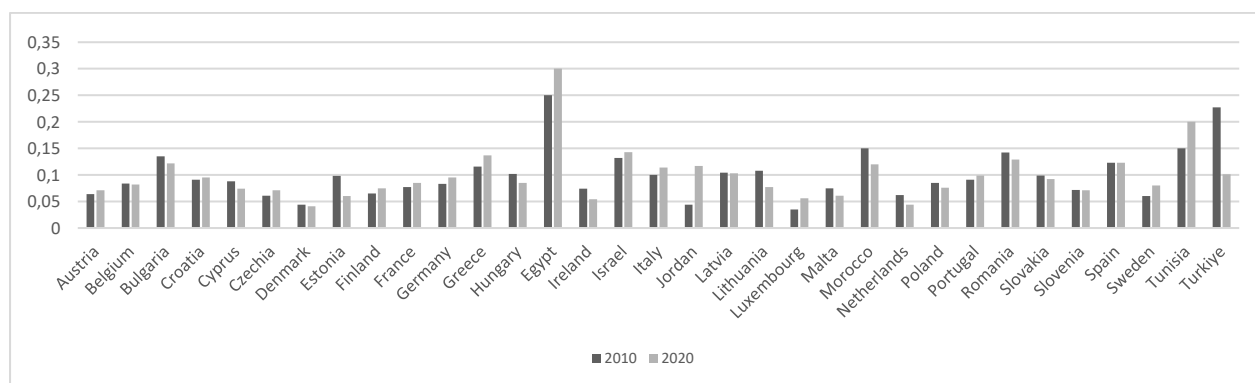


Figure 5. Working Poverty as % of employed people for Euro-Med Countries in 2010 and 2020
Source: By the author based on ILOSTAT, ILO modelled estimates

2.3 Country Absorptive Capacities

When considering countries' capacities, research and development (R&D) investment, government spending on education, and regulatory quality play crucial roles in shaping economic and social development, yet they are still challenging in the region. Figure 6 shows that R&D investment varies across Euro-Med countries. Wealthier northern Mediterranean nations such as Finland, Sweden, and Austria typically invest more than 3% of GDP in R&D, fostering technological advancement and high-value industries. In contrast, several Southern Mediterranean countries, including Morocco, Tunisia, and Egypt, invest less than 1% of GDP, often due to limited public funding and lower private sector engagement. Regarding human capital, Figure 7 shows that government spending on education accounts for more than 3% of total government expenditure in all countries, with most exceeding 5%. Some countries, like Denmark and Sweden, dedicate more

than 7% of government spending to education. While nearly all countries increased education spending between 2010 and 2020, it remains relatively low, not exceeding 10% of total government budgets. Figure 8 shows that northern Euro-Med countries generally have stronger regulatory frameworks, ensuring a transparent and efficient business environment that supports private sector growth and attracts foreign investment. Denmark, Finland, Sweden, Luxembourg, and the Netherlands perform best, with regulatory quality scores above 1.5 (near the maximum of 2.5). In contrast, regulatory quality is more variable in Southern Mediterranean countries. Weaker governance, inconsistent enforcement of labour and environmental laws, and bureaucratic inefficiencies hinder development potential. Egypt, Morocco, and Tunisia are among the lowest performing countries, with scores around -0.5.

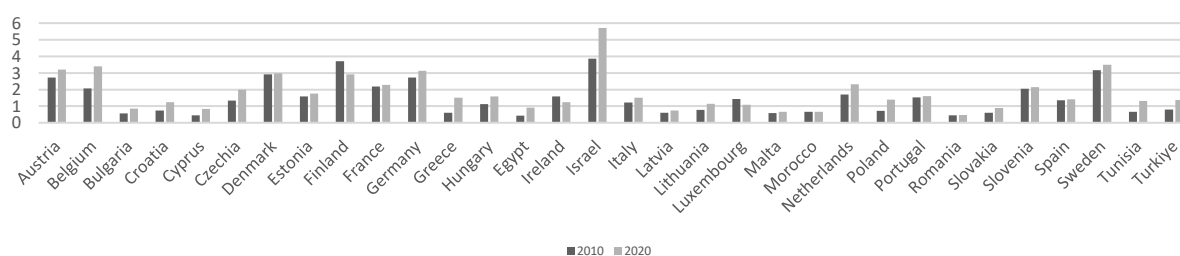


Figure 6. R&D expenditures as % of GDP for Euro- Med Countries in 2010 and 2020
Source: By the author based on WDI, WB

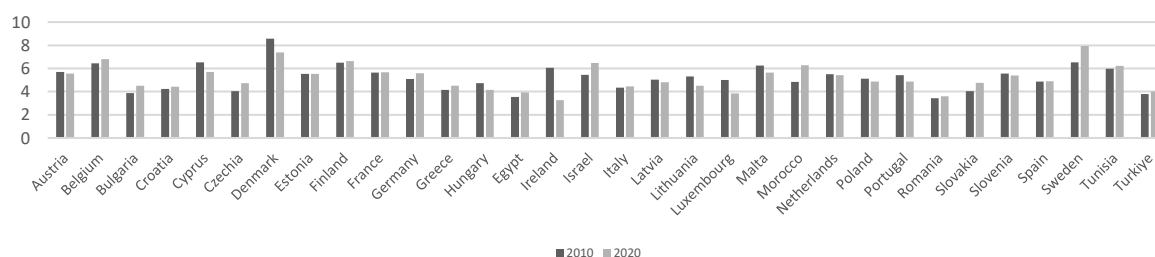


Figure 7. Education Expenditure as % of total government expenditures for Euro-Med Countries in 2010 and 2020
Source: By the author based on WDI, WB

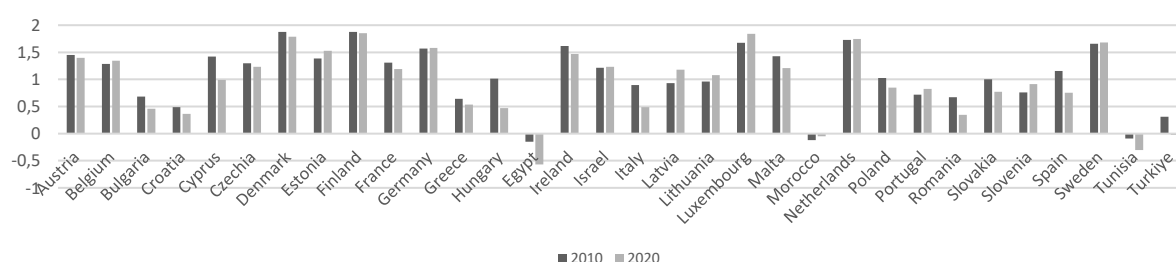


Figure 8. Regulatory Quality Index score for Euro-Med Countries in 2010 and 2020
Source: By the author based on WGI, WB

It is clear from the previous discussion that over the past decade, GVC participation has increased in the region for almost all the countries. While on the other side, a large proportion of the countries have experienced a remarkable improvement in labour wellbeing, however it remains a significant challenge for the region, especially in Southern Mediterranean countries. Hence, the question remains to discuss the causal relationship between GVCs and labour wellbeing, and whether addressing the disparities in R&D investment, education spending, and regulatory quality will be key to fostering GVCs effectiveness and ensuring sustainable growth. This will be further tested in the following section through the empirical model considering the impact of GVCs on the social upgrading, while accounting for the conditionality of the different countries' absorptive capacities.

3. METHODOLOGY AND DATA

3.1 Methodology

To test the previous hypotheses the paper uses secondary data from the Trade in Value Added (TiVA), and Inter-Country Input-Output (ICIO) database for 63 countries from 2010 to 2020. The rest of the data is retrieved from the International Labour Organization (ILO), and World Bank (WB). The study focuses on this time frame since, the pattern of GVCs has undergone significant changes over the past decade driven by various economic, technological, and geopolitical factors, where such experience has led many companies to reconsider their supply chain strategies.

The estimated model is as follows:

$$\ln LWell_{it} = \beta_0 + \beta_1 \ln GVC_{it} + \beta_2 Z_{it} + \varepsilon_{it} \quad (1)$$

$$\ln LWell_{it} = \beta_0 + \beta_1 \ln GVC_{it} + \beta_2 Z_{it} + \beta_3 GVC_{it} \times EUR_i + \varepsilon_{it} \quad (2)$$

For the panel data, i denotes the country and t the year. The main dependent variable is labour wellbeing, measured following the ILO's Decent Work Agenda (Sengenberger, 2001) through four dimensions: working poverty, labour rights, working conditions, and employment. The main independent variable is GVC participation, captured through overall, forward, and backward participation. Z_{it} represents the set of control variables, including capital stock, which may affect labour through substitution or complementarity effects (Bloch and Smith, 1977), GDP per capita as a broad economic activity measure, fertility rate for its influence on early skill acquisition and unemployment risk (Polachek and Tatsiramos, 2014), school enrolment as a proxy for education investment (Mincer, 1989), and ICT adoption, which transforms work roles and facilitates globalization (Atalay et al., 2018). EUR is a dummy variable equal to one for Euro-Mediterranean countries, with an interaction term between GVC and EUR used to capture regional effects. ε_{it} is the error term. Some variables are logged to allow proportional interpretation, and all regressors are lagged, as labour adjustments to GVC participation are not instantaneous.

To address potential endogeneity of GVC participation due to reverse causality and omitted variables, a 2SLS approach is adopted (Mayer et al., 2016; Aghion et al., 2018), using as instruments the average trade volume with other countries in the same region, excluding the country of interest (Baldwin, 2016). Tests confirm the model is identified and the instruments are valid (see Table 9).

Finally, depending on the role of national capacities in realizing GVC benefits, the framework introduces three absorptive capacities—human capital, innovation, and governance—each interacted with GVC participation. Separate estimations are conducted for each capacity, with additional interactions with the EUR dummy to explore the Euro-Mediterranean context.

$$\ln LWell_{it} = \beta_0 + \beta_1 \ln GVC_{it} + \beta_2 \ln GVC \times CAP + \beta_3 Z_{it} + \gamma_1 + \varepsilon_{it} \quad (3)$$

$$\ln LWell_{it} = \beta_0 + \beta_1 \ln GVC_{it} + \beta_2 \ln GVC \times CAP + \beta_3 \ln GVC \times CAP \times EUR_i + \beta_4 Z_{it} + \gamma_1 + \varepsilon_{it} \quad (4)$$

3.2 Data and Variables

For equation 1, the dependent variable is labour wellbeing, which is measured through four main aspects: working poverty, labour rights, working conditions, and employment. Working poverty is captured using the ILO's working poverty rate, which measures the share of employment in the lowest economic class based on the World Bank's international poverty line of \$2.15 per day. Labour rights are measured using the level of national compliance with labour rights from the ILO. This indicator assesses compliance with fundamental rights at work based on six ILO supervisory textual sources as well as national legislation, with values ranging from 0, representing the best possible score, to 10, representing the worst. Employment is measured by the annual

unemployment rate from the ILO, while working conditions are proxied by vulnerable employment as a percentage of total employment.

The main independent variable is GVC participation, measured through different linkages. Forward participation is defined as the domestic value added in foreign exports as a share of gross exports, measured by foreign exporting country. Backward participation represents the foreign value-added share of gross exports, and overall GVC participation is calculated as the sum of forward and backward linkages. The model also includes a set of control variables, with data drawn from the World Development Indicators (WDI) by the World Bank. These include the fertility rate, measured as total births per woman; GDP per capita, captured by the annual growth rate; capital stock, proxied by gross capital formation as a percentage of GDP; school enrolment, measured by net secondary school enrolment; and ICT, measured as the number of internet users per 100 population.

For equations 3 and 4, which examine the role of country capacities, three main constraints are considered: human capital, innovation, and governance. Human capital is measured as government expenditure on education as a percentage of total government spending. Innovation is captured by R&D expenditure as a percentage of GDP, with data retrieved from the WDI. Governance is measured using regulatory quality from the Worldwide Governance Indicators (WGI), which reflects perceptions of the government's ability to formulate and implement sound policies and regulations that support private sector development. Higher scores indicate better regulatory quality, with transparent and predictable regulations that facilitate economic growth, while lower scores suggest obstacles such as excessive bureaucracy, weak enforcement, or corruption, which hinder development.

4. EMPIRICAL FINDINGS

4.1 Whole Sample

This section tackles the main empirical findings using the 2SLS estimation showing the overall effects for the whole sample, then section 4.2 tackles the case of the Euro-Med countries. Each table consists of 12 columns; the first 3 columns show the effect on working poverty, the second three columns show the effect on labour rights, the next three columns show the effect on unemployment and finally the last three columns show the effect on working conditions. Within each category the first column represents the effect of the overall GVC participation, the second column shows the effect of forward GVC and finally the third column shows the effect of backward GVC.

4.1.1 Impact of GVC on Labour Wellbeing

Table 1 shows that GVC participation, especially forward linkages, improves labour wellbeing by reducing unemployment and strengthening labour rights. However, it is also associated with higher working poverty, reflecting skill mismatches, low wages, and cost-cutting strategies in developing countries. Backward linkages may increase unemployment due to outsourcing or automation. Forward linkages can create job polarization, with high-skill, well-paid jobs alongside low-skill, low-wage employment. GVCs is found to enhance labour rights compliance through pressures from multinational corporations and international standards. Among controls, GDP growth and ICT use improve labour wellbeing, while higher capital formation is linked to weaker labour outcomes, consistent with capital–labour substitution effects.

Table 1. Impact of GVC on Labour Wellbeing

	WPOV	WPOV	WPOV	LABRIGHTS	LABRIGHTS	LABRIGHTS	UNEMP	UNEMP	UNEMP	VULNER	VULNER	VULNER
<i>LGVC</i>	0.096 (1.76)*			-0.094 (2.17)**			-0.037 (1.74)*			0.002 (0.06)		
<i>LFWDGVC</i>		0.248 (3.14)***			-0.070 (2.22)**			-0.045 (1.36)			-0.059 (0.94)	
<i>LBWDGVC</i>			-0.018 (0.33)			0.030 (1.20)			0.498 (3.52)***			0.440 (1.90)
<i>LSEC</i>	0.039 (1.11)	0.040 (1.18)	0.054 (1.56)	0.022 (1.70)*	0.023 (1.81)*	0.020 (1.60)	-0.000 (0.01)	0.002 (0.24)		-0.070 (2.90)***	-0.077 (3.17)***	-0.107 (3.17)***
<i>LFERT</i>	1.024 (0.75)	0.911 (0.68)	0.619 (0.45)	-0.015 (0.04)	-0.048 (0.12)	0.064 (0.16)	-2.214 (5.09)***	-2.292 (5.13)***	-1.805 (3.40)***	0.052 (0.08)	0.247 (0.37)	1.049 (1.13)
<i>LGDPpcG</i>	-0.517 (5.80)***	-0.526 (6.01)***	-0.527 (5.88)***	0.029 (2.06)**	0.030 (2.16)**	0.029 (2.08)**	-0.135 (4.61)***	-0.132 (4.50)***	-0.130 (3.73)***	-0.046 (2.25)**	-0.041 (1.94)*	-0.031 (1.26)*
<i>LINVG</i>	0.054 (2.48)**	0.055 (2.58)**	0.059 (2.68)**	0.034 (2.02)**	0.026 (1.61)	0.035 (1.95)*	-0.011 (1.43)	-0.009 (1.19)	-0.002 (0.22)	0.020 (0.95)	0.022 (1.00)	0.045 (1.78)*
<i>LINT</i>	-0.040 (2.13)**	-0.043 (2.31)**	-0.045 (2.38)**	0.007 (1.30)	0.006 (1.14)	0.006 (1.22)	-0.052 (7.34)***	-0.049 (6.84)***	-0.031 (2.89)***	-0.039 (4.53)***	-0.037 (4.24)***	-0.027 (2.31)**
<i>_cons</i>	16.244 (5.71)***	16.789 (6.82)***	16.316 (5.84)**	7.835 (0.97)***	6.503 (0.91)***	7.548 (0.89)**	12.186 (1.74)***	8.690 (1.55)***	11.404 (1.58)**	60.130 (5.21)***	41.244 (5.05)***	55.905 (4.75)**
<i>N</i>	257	257	257	335	335	335	715	715	715	656	656	656

Source: Based on the author's own calculation. Note: Robust Standard errors are in parentheses. * p<0.1, ** p<0.05, ***p<0.01

4.1.2 Innovation Capacity

Table 2 shows the impact of GVC participation on labour wellbeing when accounting for innovation, measured by R&D expenditure. The results indicate that GVC linkages alone are insignificant; what matters is the interaction between GVCs and innovation. Innovation enhances the effectiveness of GVCs in reducing working poverty, increasing labour rights, and lowering unemployment, though it is not significant for working vulnerability. Innovation improves product quality and competitiveness, increasing demand and creating jobs. Higher value-added production can lead to better wages and job security, helping workers escape poverty. Shared research initiatives also build capabilities in developing countries, improving labour standards and empowering workers to voice concerns across geographic barriers (Ambos et al., 2021).

Table 2. Impact of GVC on Labour Wellbeing with the Innovation Capacity

	WPOV	WPOV	WPOV	LABRIGHTS	LABRIGHTS	LABRIGHTS	UNEMP	UNEMP	UNEMP	VULNER	VULNER	VULNER
<i>LGVC</i>	0.125 (0.93)			-0.012 (1.09)			-0.017 (0.43)			-0.089 (2.02)**		
<i>LGVCINOV</i>	-0.075 (1.67)*			-0.011 (4.76)***			-0.011 (2.40)**			-0.0001 (0.14)		0.013 (0.45)
<i>LFWDGVC</i>		0.059 (0.53)			0.112 (2.41)**			-0.063 (0.96)			0.001 (0.19)	
<i>LFWDGVCINOV</i>		-0.149 (1.92)*			-0.024 (4.12)***			-0.033 (3.35)***				
<i>LBWDGVC</i>			-0.096 (2.11)**			0.006 (0.66)			0.048 (0.99)			-0.007 (0.50)
<i>LBWDGVCINOV</i>			-0.168 (2.19)**			-0.021 (4.94)***			-0.007 (0.47)			0.002 (0.44)
<i>LSEC</i>	-0.019 (0.56)	0.038 (1.62)	0.064 (3.61)***	-0.016 (2.68)***	-0.019 (2.92)***	-0.013 (2.14)**	0.007 (0.53)	0.010 (0.77)	-0.017 (1.89)*	0.068 (2.31)**	0.034 (1.17)	0.035 (1.22)
<i>LFERT</i>	5.883 (3.73)***	-0.872 (0.95)	6.547 (5.01)***	0.650 (3.15)***	0.445 (1.85)*	0.703 (3.28)***	-0.511 (1.37)	-0.441 (1.19)	-4.394 (5.29)***	-1.639 (2.52)**	-1.470 (2.15)**	-1.471 (2.15)**
<i>LGDPpcG</i>	-0.130 (1.56)	-0.148 (1.80)*	-0.107 (1.47)	0.019 (0.51)	0.014 (0.35)	0.016 (0.43)	-0.271 (6.85)***	-0.274 (7.11)***	-0.310 (8.10)***	-0.010 (0.52)	-0.007 (0.33)	-0.004 (0.17)
<i>LINVG</i>	0.028 (1.87)*	0.027 (1.68)*	0.027 (1.84)*	-0.010 (1.15)	-0.008 (0.89)	-0.009 (1.13)	-0.001 (0.12)	-0.000 (0.05)	0.001 (0.17)	-0.047 (1.81)*	-0.050 (2.23)**	-0.050 (2.24)**
<i>LINT</i>	-0.009 (0.68)	-0.043 (3.40)***	-0.028 (2.29)**	-0.018 (2.46)**	-0.025 (3.37)***	-0.020 (3.01)***	-0.035 (3.96)***	-0.037 (4.09)***	-0.044 (5.11)***	-0.059 (7.04)***	-0.057 (6.85)***	-0.057 (6.99)***
<i>_cons</i>	19.413 (7.02)**	13.819 (6.09)*	17.645 (6.60)**	3.094 (1.09)***	3.925 (3.34)***	3.798 (0.99)***	12.961 (2.10)**	6.252 (2.10)*	12.324 (1.97)*	52.479 (5.842)**	25.076 (5.94)**	48.213 (5.44)**
<i>N</i>	257	257	257	335	335	335	715	715	715	656	656	656

Source: Based on the author's own calculation. Note: Robust Standard errors are in parentheses. * p<0.1, ** p<0.05; ***p<0.0

4.1.3 Governance Capacity

Table 3 shows the impact of GVC participation on labour wellbeing when accounting for governance capacity, measured by regulatory quality. The interaction between GVCs and regulatory quality is much more significant than GVCs alone, effectively reducing working poverty, unemployment, and vulnerability, while improving labour rights compliance. Higher regulatory quality creates a predictable and transparent business environment, supporting SMEs, attracting foreign investment, and promoting GVC development, which generates jobs and economic growth. Stronger regulations also streamline trade, increase market access, and raise worker incomes. Additionally, effective governance strengthens social protection and encourages

formalization of informal sectors, helping workers cope with shocks and reducing poverty (Kaplinsky and Morris, 2017).

Table 3. Impact of GVC on Labour Wellbeing with the Governance Capacity

	WPOV	WPOV	WPOV	LABRIGHTS	LABRIGHTS	LABRIGHTS	UNEMP	UNEMP	UNEMP	VULNER	VULNER	VULNER
<i>LGVC</i>	0.125 (1.46)			0.016 (1.46)			0.006 (0.19)			-0.051 (0.92)		
<i>LGVCREG</i>	-0.083 (2.73)***			-0.031 (9.48)***			-0.039 (3.24)***			-0.015 (2.89)***		
<i>LFWDGVC</i>		-0.081 (0.64)			0.168 (2.76)***			0.037 (0.67)			-0.041 (0.86)	
<i>LFWDGVCREG</i>		-0.126 (2.21)**			-0.072 (4.92)***			-0.108 (4.27)***			-0.039 (4.38)***	
<i>LBWDGVC</i>			0.258 (2.34)**			0.047 (4.71)***			0.023 (0.56)			0.005 (0.14)
<i>LBWDGVCREG</i>			-0.119 (1.99)**			-0.052 (10.34)***			-0.038 (1.94)*			-0.015 (2.26)**
<i>LSEC</i>	-0.100 (2.75)***	-0.098 (2.67)***	-0.098 (2.70)***	-0.015 (2.59)***	-0.019 (2.90)***	-0.012 (2.18)**	0.010 (0.86)	0.014 (1.20)	0.010 (0.83)	-0.009 (0.79)	-0.007 (0.63)	-0.004 (0.38)
<i>LFERT</i>	-1.335 (2.18)**	-0.673 (0.93)	-1.280 (2.10)**	0.208 (1.18)	-0.322 (1.18)	0.437 (2.38)**	-0.283 (1.05)	-0.291 (1.08)	-0.252 (0.93)	-0.280 (0.98)	0.614 (0.87)	0.641 (0.91)
<i>LGDPpG</i>	-0.189 (1.94)*	-0.074 (0.92)	-0.175 (1.83)*	0.102 (2.84)***	0.141 (2.84)***	0.083 (2.33)**	-0.269 (7.52)***	-0.271 (7.78)***	-0.274 (7.76)***	-0.062 (1.76)	-0.087 (2.83)***	-0.086 (2.74)***
<i>LNVG</i>	0.026 (1.41)	-0.018 (1.25)	0.024 (1.29)	-0.007 (0.89)	-0.007 (0.71)	-0.006 (0.72)	0.000 (0.05)	0.001 (0.10)	-0.000 (0.03)	0.003 (0.47)*	-0.000 (0.04)	0.000 (0.07)
<i>LINT</i>	-0.054 (3.36)***	-0.066 (3.99)***	-0.055 (3.43)***	-0.005 (0.68)	-0.016 (2.06)**	-0.008 (1.23)	-0.030 (3.92)***	-0.032 (4.18)***	-0.029 (3.75)***	-0.058 (8.15)***	-0.050 (6.64)***	-0.049 (6.44)***
<i>_cons</i>	17.505 (5.72)***	15.681 (7.52)***	17.918 (5.83)**	3.403 (0.98)***	3.040 (1.28)***	2.500 (0.92)**	11.827 (1.94)***	6.003 (1.84)***	12.799 (1.80)**	58.795 (5.79)***	32.236 (6.08)***	56.748 (5.41)**
<i>N</i>	257	257	257	335	335	335	715	715	715	656	656	656

Source: Based on the author's own calculation. Note: Robust Standard errors are in parentheses. * p<0.1, ** p<0.05; ***p<0.01

4.1.4 Human Capital Capacity

The scenario changes when considering investments in human capital, measured by government spending on education (Table 4). When interacting human capital with GVCs, the results suggest it can sometimes worsen labour wellbeing. This may occur due to skill mismatches, where education systems do not align with the needs of GVC industries, leaving some graduates unemployed or underemployed while skilled workers earn higher wages, widening inequality. Education improvements also take time to impact the workforce, and increased spending does not always guarantee quality. Focusing on secondary or higher education may neglect vocational training, leaving lower-skilled workers without pathways to stable employment. Without targeted interventions, GVCs may disproportionately benefit those with the right skills, leaving others behind (Fernandez-Stark et al., 2012).

Table 4. Impact of GVC on Labour Wellbeing with the HK Capacity

	WPOV	WPOV	WPOV	LABRIGHTS	LABRIGHTS	LABRIGHTS	UNEMP	UNEMP	UNEMP	VULNER	VULNER	VULNER
<i>LGVC</i>	-0.048 (0.71)			-0.017 (2.48)**			-0.315 (6.15)***			-0.227 (0.09)*		
<i>LGVCHK</i>	0.020 (1.98)**			-0.0001 (0.24)			0.014 (4.15)***			-0.0001 (0.19)		
<i>LFWDGVC</i>		-0.295 (2.71)***			0.070 (2.25)**			-0.104 (1.75)*			3.346 (0.98)***	
<i>LFWDGVCCHK</i>		0.068 (4.15)***			-0.003 (1.03)			0.024 (3.18)***			-0.431 (0.12)***	
<i>LBWDGVC</i>			-0.242 (2.92)***			-0.022 (1.44)			-0.124 (3.10)***			-0.040 (1.14)
<i>LBWDGVCCHK</i>			0.057 (4.23)***			-0.0001 (0.10)			0.010 (2.26)*			-0.002 (0.70)
<i>LSEC</i>	-0.048 (1.22)	-0.122 (3.44)***	-0.094 (2.84)***	-0.002 (0.36)	-0.007 (1.12)	-0.005 (0.85)	-0.008 (1.19)	-0.011 (1.63)	-0.009 (1.37)	0.030 (4.02)***	0.020 (3.14)***	0.031 (4.38)***
<i>LFERT</i>	2.751 (1.82)*	2.671 (2.38)**	1.975 (1.87)*	-0.412 (1.66)*	-0.652 (2.72)***	-0.641 (2.64)***	-4.841 (6.62)***	-5.690 (8.20)***	-5.812 (8.53)***	0.769 (1.19)	0.295 (0.44)	0.696 (1.09)
<i>LGDPpG</i>	3.179 (3.81)***	-0.130 (1.53)	-0.228 (2.79)***	0.025 (2.25)**	0.024 (2.18)**	0.025 (2.22)**	-14.962 (14.22)***	-15.204 (15.18)***	-15.363 (15.04)***	-7.626 (7.95)***	-7.037 (7.29)***	-7.746 (8.08)***
<i>LNVG</i>	-0.014 (0.79)	-0.013 (0.84)	0.021 (1.17)	0.000 (0.06)	-0.002 (0.77)	-0.000 (0.20)	-0.015 (2.45)**	-0.030 (5.46)***	-0.027 (4.93)***	-0.003 (0.56)	-0.006 (1.16)	-0.004 (0.77)
<i>LINT</i>	-0.024 (1.16)	0.018 (1.09)	0.001 (0.04)	0.001 (0.24)	-0.002 (0.58)	-0.001 (0.38)	0.031 (3.37)***	0.026 (3.04)***	0.030 (3.39)***	-0.023 (2.78)***	-0.029 (3.41)***	-0.022 (2.66)***
<i>_cons</i>	16.555 (5.90)**	16.664 (8.92)**	20.466 (6.97)**	6.997 (1.07)***	2.318 (2.62)	7.128 (1.02)**	13.032 (2.03)**	2.731 (3.64)**	13.280 (1.92)**	56.946 (5.99)**	4.852 (13.53)	44.728 (8.29)**
<i>N</i>	257	257	257	335	335	335	715	715	715	656	656	656

Source: Based on the author's own calculation. Note: Robust Standard errors are in parentheses. * p<0.1, ** p<0.05; ***p<0.01

4.2 Euro-Mediterranean Case

This section shows the main empirical findings while focussing on the Euro-Med region. Within each category, an interaction term is introduced between GVC and all its linkages with the dummy variable EUR to differentiate the effect for countries in the region.

4.2.1 Impact of GVC on Labour Wellbeing for EURO-MED

Table 5 examines GVC participation in the Euro-Med region. GVCs and their linkages reduce working poverty and vulnerability and improve labour rights, but they are associated with higher unemployment. This reflects the region's reliance on low-skilled, labour-intensive sectors like agriculture and textiles, where workers struggle to adapt to shifts in global demand. Outsourcing to lower-cost countries and skill mismatches, especially in high-tech sectors, contribute to job losses, affecting youth and women in less developed economies such as Algeria and Egypt. While some sectors benefit from higher wages, others face unemployment, creating a dual effect. To reconcile these outcomes, policymakers need strategies for inclusive growth, including education and training, innovation support, and regional economic diversification. Complementing GVC participation with these capacities is essential for effective social upgrading in the region (Timmer et al., 2013).

Table 5. Impact of GVC on Labour Wellbeing for EURO-MED

	WPOV	WPOV	WPOV	LABRIGHTS	LABRIGHTS	LABRIGHTS	UNEMP	UNEMP	UNEMP	VULNER	VULNER	VULNER
<i>LnGVC</i>	-0.021 (0.31)			0.056 (4.10)***			-0.168 (6.51)***			-0.069 (0.88)		
<i>LGVC</i> <i>EUR</i>	-0.195 (4.98)***			-0.046 (10.34)***			0.075 (9.23)***			-0.134 (5.41)***		
<i>LFDWGVC</i>		0.238 (0.51)			0.017 (0.44)			0.256 (3.31)***			0.723 (3.12)***	
<i>LFDWGVC</i> <i>EUR</i>		-0.415 (5.07)***			-0.075 (8.53)***			0.121 (6.89)***			-0.371 (7.02)***	
<i>LBWDGVC</i>			-0.010 (0.16)			0.083 (6.85)***			-0.188 (7.63)***			-0.021 (0.28)
<i>LBWDGVC</i> <i>EUR</i>			-0.295 (4.18)***			-0.087 (11.75)***			0.140 (9.38)***			-0.183 (4.01)***
<i>LSEC</i>	-0.132 (3.56)***	-0.170 (1.75)*	-0.134 (3.40)***	-0.016 (2.86)***	-0.018 (3.11)***	-0.016 (3.02)***	0.059 (5.48)***	0.046 (3.66)***	0.052 (4.74)***	-0.138 (4.20)***	-0.164 (4.30)***	-0.147 (4.36)***
<i>LFERT</i>	1.758 (1.92)*	1.028 (0.44)	1.464 (1.47)	-0.100 (0.59)	-0.048 (0.23)	0.004 (0.02)	-1.556 (4.94)***	-2.071 (5.30)***	-1.759 (5.46)***	3.658 (3.82)***	2.652 (2.26)**	3.662 (3.71)***
<i>LGDP</i> <i>pcG</i>	-0.516 (3.05)***	-0.554 (2.69)***	-0.522 (3.04)***	0.123 (3.53)***	0.121 (3.09)***	0.101 (3.03)***	-0.275 (5.29)***	-0.294 (5.19)***	-0.280 (5.39)***	0.259 (1.64)	0.240 (1.42)	0.237 (1.49)
<i>LINVG</i>	0.069 (1.50)	0.062 (1.34)	0.068 (1.46)	-0.010 (1.28)	-0.013 (1.52)	-0.009 (1.18)	0.004 (0.31)	-0.002 (0.12)	0.000 (0.01)	-0.026 (0.58)	-0.046 (0.97)	-0.020 (0.44)
<i>LINT</i>	-0.051 (1.80)	-0.060 (1.92)*	-0.056 (1.98)**	-0.039 (6.84)***	-0.036 (5.64)***	-0.033 (6.29)***	-0.081 (8.94)***	-0.104 (10.41)***	-0.091 (10.23)***	-0.298 (10.79)***	-0.339 (11.31)***	-0.306 (11.28)***
<i>_cons</i>	18.074 (3.29)***	18.146 (2.74)***	18.296 (3.23)***	4.805 (5.22)***	6.475 (8.09)***	4.810 (6.07)***	15.982 (9.09)***	7.945 (5.09)***	14.628 (9.25)***	53.372 (10.00)***	43.520 (9.29)***	51.691 (10.68)***
<i>N</i>	257	257	257	335	335	335	715	715	715	656	656	656

Source: Based on the author's own calculation. Note: Robust Standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$; *** $p < 0.01$

4.2.2 Innovation Capacity for EURO-MED

Table 6 shows that innovation enhances the effectiveness of GVCs in the Euro-Med region by reducing working poverty and vulnerability and improving labour rights, with the interaction term significant in most specifications. However, innovation with GVCs is associated with higher unemployment.

Innovation may improve labour wellbeing by enabling firms to upgrade production, develop higher-value products, adopt green technologies, and support SMEs, leading to higher wages, job security, and better working conditions. It also strengthens labour rights through transparency, worker empowerment, and digital monitoring tools. At the same time, R&D-driven innovation often targets advanced technologies requiring highly skilled labour, which many Euro-Med countries lack, particularly in low-skilled sectors. This mismatch can increase unemployment despite gains in other aspects of labour wellbeing (Fischer et al., 2024).

Table 6. Impact of GVC on Labour Wellbeing with the Innovation Constraint for EURO-MED

	WPOV	WPOV	WPOV	LABRIGHTS	LABRIGHTS	LABRIGHTS	UNEMP	UNEMP	UNEMP	VULNER	VULNER	VULNER
LGVC	-0.227 (2.99)***			0.009 (0.70)			-0.093 (3.87)**			-0.171 (2.55)*		
LGYNINOV	0.134 (6.09)***			0.000 (0.02)			-0.042 (6.52)**			0.033 (1.80)		
LGVCURINO	-0.191 (4.36)***			-0.012 (4.24)***			0.033 (6.27)**			-0.065 (4.39)**		
LFDWGVC		0.417 (1.09)			0.046 (0.92)			0.471 (4.24)**			0.969 (3.37)**	
LFDWGCINOV		0.202 (3.60)***			-0.006 (0.74)			-0.117 (6.03)**			-0.076 (1.51)	
LFDWGVCEURINO		-0.332 (4.21)***			-0.021 (3.73)**			0.074 (5.25)**			-0.078 (2.11)*	
LBWDGVC			-0.301 (4.04)***			0.018 (1.88)*			-0.049 (2.43)*			-0.132 (2.39)*
LBWDGCINOV			0.263 (5.85)***			0.005 (0.67)			-0.073 (5.66)**			0.110 (3.08)**
LBWDGVCEURINO			-0.343 (3.41)***			-0.026 (4.56)***			0.062 (6.04)**			-0.141 (4.96)**
LINVG	-0.123 (2.81)***	-0.158 (2.56)**	-0.145 (3.20)***	-0.008 (1.35)	-0.011 (1.82)*	-0.007 (1.11)	0.057 (4.46)**	0.048 (3.22)**	0.058 (4.45)**	0.018 (0.41)	0.021 (0.43)	0.016 (0.36)
LINT	1.650 (1.51)	0.168 (0.08)	0.643 (0.55)	0.753 (3.72)***	0.658 (2.81)***	0.780 (3.76)***	-2.023 (5.15)**	-2.497 (5.10)**	-2.054 (5.01)**	-0.310 (9.51)**	-0.312 (9.19)**	-0.336 (10.92)**
LGDPpcG	-0.251 (1.51)	-0.410 (1.98)**	-0.293 (1.74)*	0.029 (0.80)	0.027 (0.74)	0.029 (0.81)	-0.274 (4.82)**	-0.338 (5.08)**	-0.293 (5.12)**	0.041 (0.26)	-0.120 (0.70)	0.039 (0.24)
LFERT	0.042 (0.95)	0.030 (0.65)	0.035 (0.78)	-0.010 (1.26)	-0.010 (1.17)	-0.010 (1.26)	0.005 (0.31)	0.004 (0.24)	0.004 (0.27)	4.681 (4.27)**	3.953 (3.11)**	4.242 (3.75)**
LSEC	-0.060 (2.03)**	-0.096 (2.66)***	-0.075 (2.55)**	-0.028 (3.84)***	-0.028 (4.09)***	-0.030 (4.31)***	-0.065 (5.56)**	-0.076 (5.83)**	-0.081 (7.27)**	-0.068 (1.91)	-0.083 (2.15)*	-0.078 (2.15)*
_cons	21.781 (3.20)**	13.523 (2.25)*	23.506 (3.61)**	3.300 (3.08)***	3.279 (3.23)***	3.090 (3.18)***	16.018 (2.12)**	5.826 (2.23)**	13.858 (1.95)**	46.500 (7.83)**	25.521 (4.40)**	44.728 (8.29)**
N	257	257	257	335	335	335	715	715	715	656	656	656

Source: Based on the author's own calculation. Note: Robust Standard errors are in parentheses. * p<0.1, ** p<0.05; ***p<0.01

4.2.3 Governance Capacity for EURO-MED

Table 7 highlights the crucial role of governance in enhancing GVC effectiveness in the Euro-Med region, showing that regulatory quality is the most important constraint compared to innovation or human capital. GVCs interacting with strong regulatory frameworks effectively reduce working poverty, vulnerability, and unemployment, while improving labour rights.

High regulatory quality ensures alignment with international labour standards, facilitates smoother GVC integration, and mitigates competitive disadvantages. It also strengthens labour conditions, attracts conscientious consumers, and enhances transparency in sectors prone to exploitation, such as agriculture and textiles. Furthermore, strong governance promotes dialogue among governments, employers, and labour unions, supporting effective labour policies and a collaborative environment. Overall, harmonized standards, enforcement, and social dialogue enable countries to prioritize labour wellbeing within GVCs (Maskus, 2002).

Table 7. Impact of GVC on Labour Wellbeing with the Governance Constraint for EURO-MED

	WPOV	WPOV	WPOV	LABRIGHTS	LABRIGHTS	LABRIGHTS	UNEMP	UNEMP	UNEMP	VULNER	VULNER	VULNER
LGVC	-0.001 (0.25)			0.045 (3.15)***			-0.272 (4.20)***			-0.154 (1.86)*		
LGVCREG	0.000 (0.26)			-0.021 (5.12)***			-0.052 (1.82)			0.031 (1.38)		
LGVCREGEUE	-0.027 (7.09)***			-0.016 (3.73)***			-0.005 (0.91)*			-0.074 (3.25)***		
LFDWGVC		-0.006 (0.37)			0.068 (1.07)			0.034 (0.64)			1.414 (3.54)***	
LFDWGCYREG		0.001 (0.33)			-0.036 (2.12)**			-0.053 (1.66)*			-0.368 (3.33)***	
LFDWGVCREGEUE		-0.038 (4.11)***			-0.042 (4.48)***			-0.140 (2.85)***			0.079 (1.11)	
LBWDGVC			-0.001 (0.66)			0.058 (4.57)***			-0.271 (4.30)***			-0.140 (1.85)*
LBWDGCYREG			0.000 (0.22)			-0.041 (5.45)***			-0.018 (0.82)			0.114 (2.86)***
LBWDGVCREGEUE			-0.048 (6.23)***			-0.015 (1.74)*			0.010 (0.99)			-0.148 (3.44)***
LSEC	-0.004 (3.84)***	-0.003 (1.80)*	-0.005 (3.78)***	-0.008 (1.42)	-0.012 (1.95)*	-0.010 (1.77)*	0.001 (0.05)	0.017 (1.41)	-0.020 (1.52)	-0.134 (3.89)***	-0.140 (3.12)***	-0.150 (4.24)***
LFERT	-0.053 (1.97)**	0.038 (0.78)	-0.036 (1.27)	0.318 (1.84)*	-0.057 (0.23)	0.468 (2.51)**	-0.435 (1.33)	-0.249 (0.93)	-4.007 (5.14)***	4.315 (4.41)***	1.650 (1.13)	3.938 (3.84)***
LGDPpcG	-0.002 (0.34)	0.002 (0.24)	-0.006 (2.20)**	0.109 (3.06)***	0.131 (3.02)***	0.082 (2.28)**	-0.201 (5.06)***	-0.270 (7.79)***	-0.244 (6.67)***	0.262 (1.62)	0.804 (3.76)***	0.270 (1.67)*
LINVG	0.001 (0.81)	0.001 (0.42)	0.000 (0.32)	-0.008 (0.98)	-0.011 (1.25)	-0.006 (0.72)	0.003 (0.36)	-0.000 (0.04)	0.003 (0.39)	-0.019 (0.42)	-0.076 (1.45)	-0.021 (0.47)
LINT	0.002 (1.88)*	0.002 (2.18)**	0.002 (2.20)**	-0.013 (1.80)*	-0.020 (2.95)***	-0.011 (1.69)*	-0.029 (3.57)***	-0.034 (4.45)***	-0.035 (4.30)***	-0.314 (9.66)***	-0.329 (8.41)***	-0.344 (11.05)***
_cons	0.487 (2.96)**	0.310 (1.37)*	0.479 (2.94)**	1.925 (1.82)*	3.925 (3.34)**	2.228 (2.32)*	13.653 (2.04)**	5.190 (1.99)*	13.615 (1.85)*	53.983 (8.92)**	28.557 (4.69)**	54.251 (9.90)**
N	257	257	257	335	335	335	715	715	715	656	656	656

Source: Based on the author's own calculation. Note: Robust Standard errors are in parentheses. * p<0.1, ** p<0.05; ***p<0.01

4.2.4 Human Capital Capacity for EURO-MED

For the Euro-Med countries, human capital positively impacts labour wellbeing when combined with GVC participation for most aspects, except unemployment (Table 8). This is largely due to inequalities in access to education. Even when governments spend more on education, job opportunities are not guaranteed because countries in the region have uneven economic development and educational infrastructure. Rural and underdeveloped areas face significant barriers, resulting in a less skilled workforce that cannot fully participate in GVCs. Socioeconomic and cultural factors exacerbate these gaps. Children from low-income households may drop out to support their families, and girls often face additional barriers, such as early marriage, which limits educational attainment. Limited access to vocational training leaves marginalized groups unprepared for available jobs. Moreover, the focus on higher education can overshadow primary and secondary education needs, creating skill mismatches. Inefficiencies in policy implementation, mismanagement, or corruption can further limit the effectiveness of education spending, contributing to higher unemployment among those unable to access quality education (Downes, 2014).

Table 8. Impact of GVC on Labour Wellbeing with the HK Constraint for EURO-MED

	WPOV	WPOV	WPOV	LABRIGHTS	LABRIGHTS	LABRIGHTS	UNEMP	UNEMP	UNEMP	VULNER	VULNER	VULNER
<i>LGVC</i>	-0.302 (3.22)***			0.047 (2.99)***			-0.301 (5.93)***			-0.085 (0.85)		
<i>LGVCCHK</i>	0.046 (3.72)**			-0.003 (1.34)			-0.001 (0.40)			-0.004 (0.37)		
<i>LGVCCHKEUR</i>	-0.037 (4.69)***			-0.007 (9.03)***			0.017 (4.19)***			-0.023 (5.07)***		
<i>LFDGVC</i>		0.007 (1.23)			0.122 (1.05)			-0.094 (1.58)			1.936 (3.62)***	
<i>LFDGVCCHK</i>		-0.003 (3.06)***			-0.019 (1.37)			0.004 (0.43)			-0.215 (3.70)***	
<i>LFDGVCCHKEUR</i>		-0.010 (2.29)**			-0.014 (7.96)**			0.041 (3.11)***			-0.036 (3.21)***	
<i>LBWDGVC</i>			-0.008 (1.44)			0.049 (2.76)**			-0.115 (2.97)***			-0.115 (1.24)
<i>LBWDGVCCHK</i>			0.001 (1.07)			0.001 (0.46)			0.005 (1.68)*			-0.006 (0.44)
<i>LBWDGVCCHKEUR</i>			-0.019 (5.97)***			-0.014 (10.11)**			0.009 (1.77)*			-0.012 (1.71)*
<i>LSEC</i>	-0.070 (2.35)**	0.001 (0.80)	-0.005 (3.10)***	-0.005 (0.79)	0.001 (0.09)	-0.008 (1.31)	-0.006 (0.69)	-0.011 (1.70)*	-0.012 (1.60)	-0.105 (2.83)***	-0.068 (1.70)*	-0.103 (3.28)***
<i>LFERT</i>	3.487 (4.95)***	-0.183 (3.22)***	-0.203 (2.62)***	-0.033 (0.18)	0.018 (0.09)	-0.042 (0.23)	-4.839 (6.36)***	-5.780 (8.39)***	-5.950 (8.44)***	4.451 (4.43)***	5.163 (4.58)**	5.119 (5.83)***
<i>LGDPpcG</i>	0.524 (3.75)***	-0.0001 (0.11)	-0.003 (1.34)	0.106 (2.88)***	0.088 (2.09)*	0.111 (3.15)**	-15.470 (14.29)***	-15.249 (15.35)***	-15.757 (15.00)***	0.122 (0.75)	0.333 (1.37)	0.866 (5.53)***
<i>LINVG</i>	0.029 (1.06)	0.0001 (0.54)	-0.0001 (0.04)	-0.016 (1.95)*	-0.016 (1.66)	-0.016 (2.00)*	-0.014 (2.11)**	-0.029 (5.29)***	-0.027 (4.79)***	0.005 (0.11)	-0.068 (1.33)	-0.071 (1.83)
<i>LINT</i>	-0.105 (4.68)***	-0.002 (2.39)**	-0.001 (1.93)*	-0.038 (6.46)***	-0.035 (5.68)**	-0.037 (6.81)**	0.028 (2.91)***	0.027 (3.14)***	0.027 (2.90)***	-0.294 (10.46)***	-0.303 (9.02)***	-0.347 (14.91)***
<i>_cons</i>	10.664 (2.48)**	18.417 (8.69)**	24.694 (7.07)***	4.197 (4.07)**	4.119 (2.51)*	4.780 (5.20)**	16.422 (2.06)***	0.535 (4.17)	15.456 (1.92)***	49.694 (8.10)***	21.416 (3.17)**	46.734 (10.18)***
<i>N</i>	257	257	257	335	335	335	715	715	715	656	656	656

Source: Based on the author's own calculation. Note: Robust Standard errors are in parentheses. * p<0.1, ** p<0.05; *** p<0.01

Table 9. Overidentification and Under-identification tests of the instruments

Test	P-value	Test Statistic
<i>Sargan statistic</i> (overidentification test of all instruments)	0.5767	0.312
<i>Under-identification test</i>	0.0000	64.267

Source: Based on the author's own calculation.

CONCLUSION

The current study investigated the multifaceted impacts of GVC participation on labour wellbeing, analysing data from 63 countries between 2010 and 2020. The findings, based on 2SLS estimation, highlight both positive and negative effects of GVCs. GVCs are shown to improve labour wellbeing by enhancing labour rights compliance and reducing unemployment. However, they also contribute to exacerbating working poverty. The study emphasizes the importance of innovation capacity and governance quality in enhancing the social upgrading effects of GVCs. Investments in R&D are found to enhance GVC effectiveness in improving labour rights and reducing working poverty and unemployment, while a strong regulatory environment ensures GVCs benefit workers by promoting labour rights and reducing vulnerability, poverty and unemployment. However, the

interaction between GVCs and human capital, measured by government spending on education, presents challenges. While education is critical for long-term labour market success, a mismatch between educational outcomes and GVC needs may lead to higher unemployment and working poverty, especially for those lacking the necessary skills for the global economy.

In conclusion, the study's findings suggest that GVC participation has the potential to improve labour wellbeing, but this requires targeted policy design to ensure that the benefits are equitably distributed. Governments should adopt a comprehensive, inclusive approach that integrates GVC participation with investments in human capital, innovation, and governance, while addressing skill mismatches, improving regulatory frameworks, fostering inclusive growth, and addressing educational disparities, such that countries could maximize the positive impacts of GVCs while mitigating their negative effects, ensuring that the benefits of global economic integration reach all segments of society. Such policies may include:

- Reducing skill mismatches through expanded vocational training aligned with GVC needs, greater access to quality education in underserved areas, and stronger emphasis on digital skills. Collaboration with the private sector is essential to align curricula with global labour market demands.
- Supporting displaced and vulnerable workers via retraining and reskilling programs, active labour market policies, and targeted social protection, with particular attention to low-skilled sectors, rural areas, women, and youth.
- Promoting innovation and R&D, especially in sectors with comparative advantage, to facilitate upgrading within GVCs, improve working conditions, and support sustainable and green technologies, including incentives for SMEs to innovate.
- Strengthening labour rights enforcement by aligning national laws with international standards, improving transparency mechanisms, harmonizing regulations across regions such as Euro-Med, and fostering social dialogue among key stakeholders.
- Encouraging economic diversification and regional cooperation to reduce reliance on low-skilled sectors, enhance resilience to shocks, and improve labour outcomes through shared infrastructure, workforce mobility, and coordinated industrial policies.

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