7

Technology, Productivity and Inclusive Growth Through Global Value Chains

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7.1 Introduction

For more than three decades, global value chains (GVCs) and rapid technological change have combined to reshape the global economy. These two closely intertwined forces have altered patterns of production, opened new pathways for economic catch-up and facilitated the transfer of technology and knowledge across borders. At the same time, they have coincided with rising concerns about inequality – especially within economies – as the distribution of the gains from globalization and innovation has varied widely both across and within economies.

One common view is that global income gaps between economies have narrowed, while income and opportunity gaps within economies have widened. Since the 1980s, rapid growth in economies such as the People's Republic of China (PRC) and India has contributed to a decline in between-economy inequality (Bourguignon, 2016; Milanovic, 2016). At the same time, within-economy inequality – driven in part by rising top incomes (Piketty, 2020) – has increased in many economies, particularly high-income ones. Commentators have pointed to the global fragmentation of production through GVCs and the uneven diffusion of digital and automation technologies as possible drivers of these patterns (Acemoglu and Restrepo, 2019; Duarte et al., 2022).

At their core, GVCs enable specialization, efficiency and learning, enabling economies to participate in global production without building the full industrial base. Technological advances – especially in information and communications technologies (ICTs), logistics and digital platforms – have been instrumental in supporting this fragmentation.

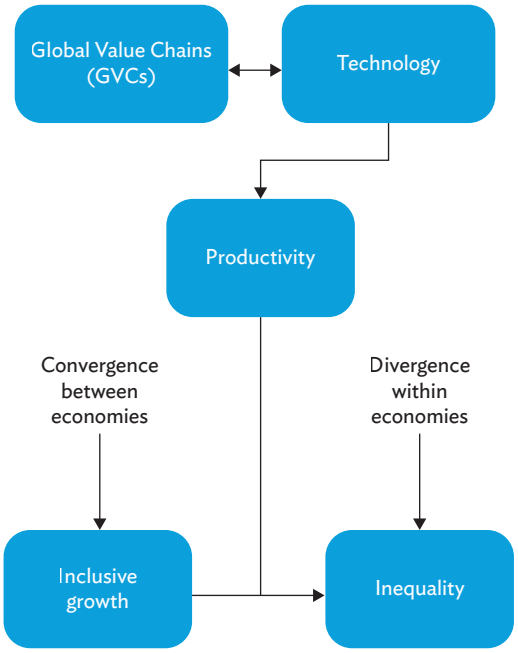
Note: The work on this chapter was led by the Asian Development Bank (ADB) and the University of International Business and Economics. The views expressed are those of the authors and do not necessarily reflect the views and policies of ADB or its Board of Governors or the governments they represent.

Technological change has enabled production processes to be broken down into discrete tasks, further lowering coordination and transport costs that enable these tasks to be located across economies according to cost and capability advantages (Baldwin, 2011).

GVCs, in turn, can serve as channels for technology diffusion, exposing firms to international standards, upgrading pressures and new forms of knowledge. Firms embedded in GVCs often face incentives to innovate, adopt new technologies and improve productivity (e.g., Agostino et al., 2025; Zeng et al., 2025). This interaction – GVCs enabling technology transfer and technology enabling deeper global value chain integration – has the potential to boost productivity growth and drive structural transformation.

Yet important questions remain. What factors influence the extent to which GVC participation speeds catch up? To what extent are these gains widely shared within participating economies? Are the benefits of GVC participation and technological change concentrated among certain firms, workers or regions? Could new technologies – especially automation and artificial intelligence (AI) – alter the distribution of income in ways that limit the inclusiveness of productivity gains?

Figure 7.1: Global Value Chains, Technology and the Productivity-Inequality Trade-Off



Source: Authors.

Understanding these questions requires examining how GVC participation and technological change interact to influence productivity – and how the resulting gains are distributed (Figure 7.1). This chapter investigates both productivity and distributional outcomes to identify the channels linking GVCs, technology and inclusiveness, and to

explore policy options for aligning these forces with broader development goals. It asks: How have GVCs and technology affected productivity across firms and economies? Through which mechanisms might they influence inequality within economies? What policies can help ensure that the benefits are more widely shared? By asking such questions, the chapter seeks to address the broader query of whether GVCs and technology primarily serve as engines of productivity and convergence between economies, or whether they can also shape inequality within them – and under what conditions.

The chapter proceeds as follows. Section 7.2 investigates the prevailing convergence-divergence narrative by examining trends in between- and within-economy inequality. Section 7.3 focuses on the productivity effects of GVCs and technology – at both macro and micro levels – and outlines key mechanisms of convergence and learning. Section 7.4 builds on this to examine inequality dynamics, highlighting how GVCs and new technologies shape labor markets, wage structures and firm dynamics. Section 7.5 discusses policy strategies for enabling inclusive productivity growth – ranging from skills and innovation policies to digital infrastructure and labor protections. Section 7.6 concludes by summarizing the key messages and outlining implications for policymakers in a world of rapid technological and economic transformation.

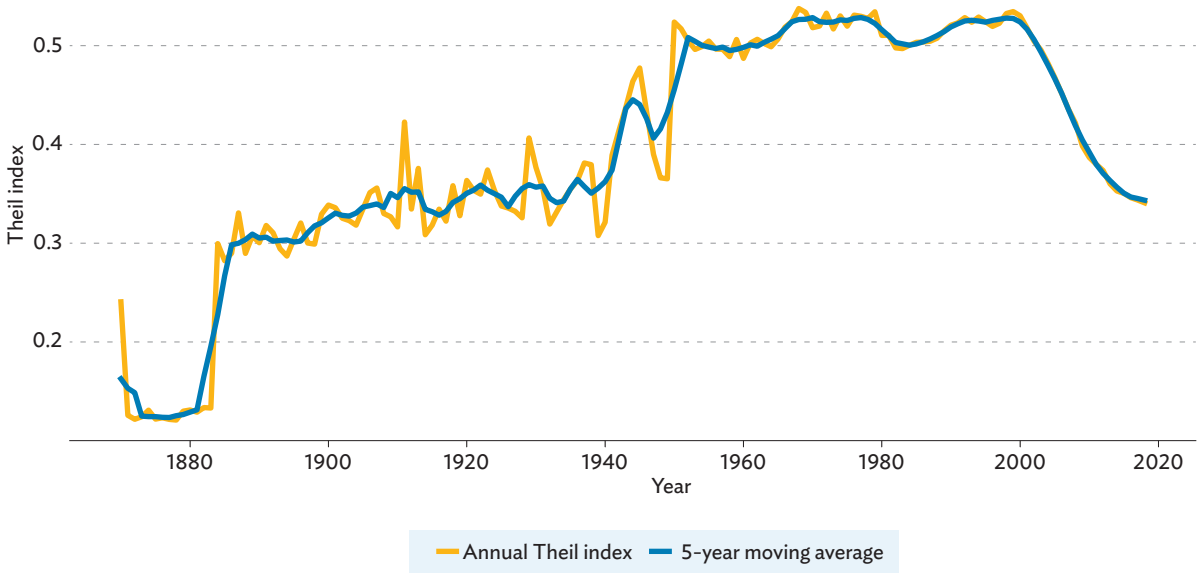
7.2 Recent Developments in Between- and Within-Economy Inequality

Debates around the impact of globalization and global value chain integration often start from a stylized fact: during the GVC era, inequality between economies has fallen sharply, while inequality within economies has risen. These dynamics are frequently linked to political backlash against globalization, particularly in high-income economies, and to renewed protectionist pressures (WTO, 2024). However, both the narrative of dramatic between-economy convergence and the idea of widespread within-economy divergence deserve closer scrutiny (Milanovic, 2012; Lakner and Milanovic, 2013).

Between-economy inequality increased rapidly after the first industrial revolution with the rise of Western dominance and colonial empires, subsequently stabilizing at a high level (World Inequality Report, 2022) (Figure 7.2). In contrast, the past three decades have seen convergence in per capita incomes, particularly when measured with population-weighted indicators.

Using World Bank data on gross domestic product (GDP) per capita (in constant purchasing power parities) for 1990-2023, Figure 7.3 shows a pronounced decline in population-weighted between-economy inequality. However, this pattern looks less dramatic when using unweighted measures, suggesting that much of the apparent convergence is driven by a small number of populous emerging economies – most notably the PRC and India. Excluding these two economies, the weighted Theil index of economic inequality shows little net change over the period, with fluctuations masking the absence of sustained convergence.

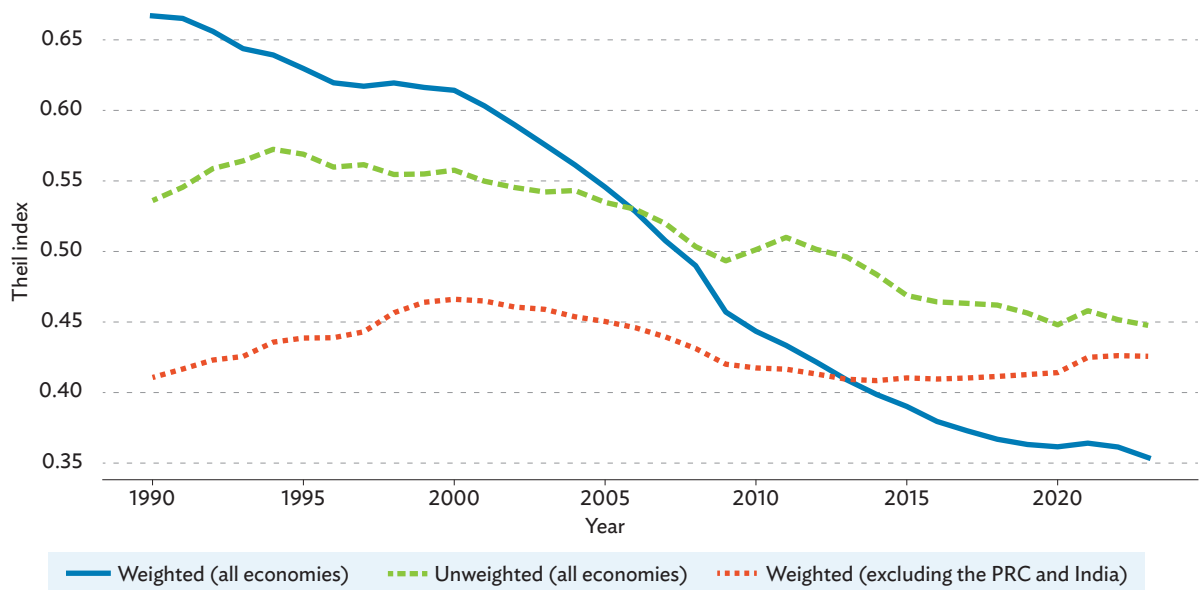
Figure 7.2: Developments in Between-Economy Inequality, 1870-2018



Notes: The indicator is based on data on per capita GDP in constant purchasing power parities (PPP). The weighted Theil index (for a particular year) is calculated as $T_W = \sum_{i=1}^{N} \frac{p_i}{P}\left(\frac{y_i}{\bar{y}} \ln\left(\frac{y_i}{\bar{y}}\right)\right)$, with y_i being per capita GDP of economy i, $\bar{y}$ being global per capita GDP, N being the number of economies, and $\frac{p_i}{P}$ being the share of economy i in the total population of all economies in the sample. The indicator is constructed using all economies available in the dataset in any given year, meaning that the indicator is not based on a common sample of economies.

Source: The Maddison Project Database 2020

Figure 7.3: Developments in Between-Economy Inequality Since 1990

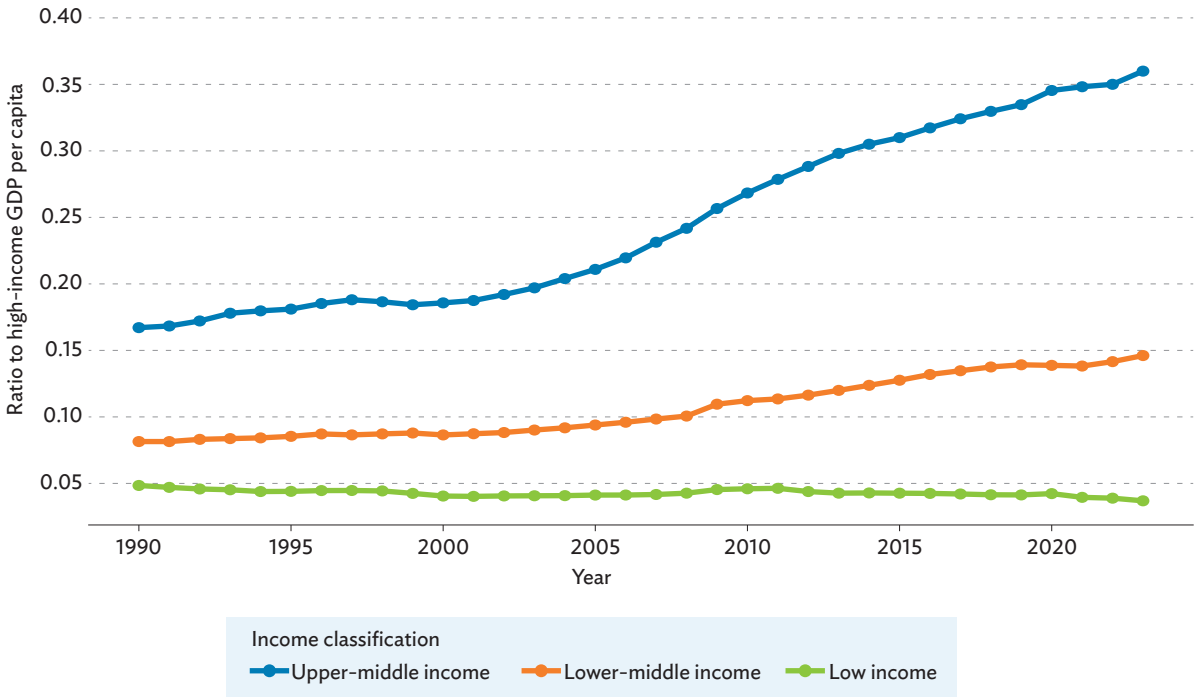


Note: The indicator is based on data on per capita GDP in constant PPP. The weighted Theil index (for a particular year) is calculated as $T_W = \sum_{i=1}^{N} \frac{p_i}{P}\left(\frac{y_i}{\bar{y}} \ln\left(\frac{y_i}{\bar{y}}\right)\right)$, with y_i being per capita GDP of economy i, $\bar{y}$ being global per capita GDP, N being the number of economies, and $\frac{p_i}{P}$ being the share of economy i in the total population of all economies in the sample. The unweighted Theil index drops the population weights in its construction.

Source: World Bank's World Development Indicators

The heterogeneity in outcomes can be further seen in Figure 7.4, which shows the ratio of (population-weighted) GDP per capita of low, lower-middle and upper-middle-income economies to that of high-income economies. The figure highlights how catch-up to high-income economies has occurred unevenly across income groups, with lower-middle and upper-middle income economies roughly able to double this ratio since 1990, but low-income economies seeing no catch-up to high-income economies. Such results are suggestive of the view that the potential benefits of GVC integration and recent technological developments have not been shared equally across economies.

Figure 7.4: Heterogeneous Catch-Up by Income Group



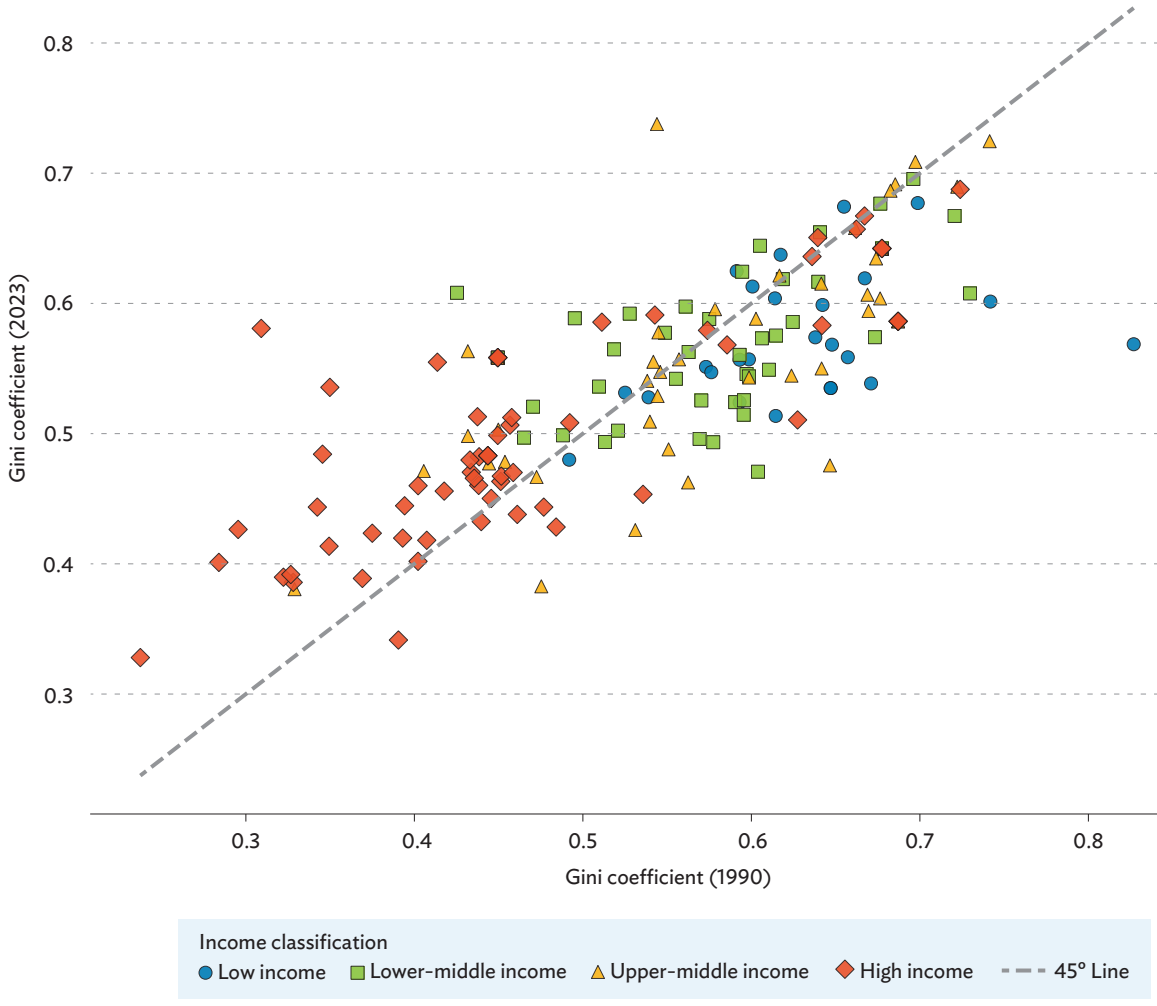
Note: The figure reports information on the ratio of the population-weighted average GDP per capita (in constant purchasing power parities) of low, lower-middle and upper-middle income economies to that of high-income economies. The definition of income groupings is based on an economy's status in 2023, according to the World Bank's classification.
Source: World Bank's World Development Indicators

Turning to within-economy inequality, Figure 7.5 uses data from the World Inequality Database to report information on the Gini coefficient of within-economy income inequality in 1990 and 2023. The figure reveals that most high-income economies lie above the 45-degree line indicating rising inequality, albeit from initially relatively low levels in most cases. In contrast, while the 1990 values of the Gini for non-high-income economies tend to be relatively high, most of these economies lie below the 45-degree line suggesting declining inequality.

Figure 7.5 suggests that rising within-economy inequality is far from universal and is concentrated in certain contexts. This can be further seen in Figure 7.6, which

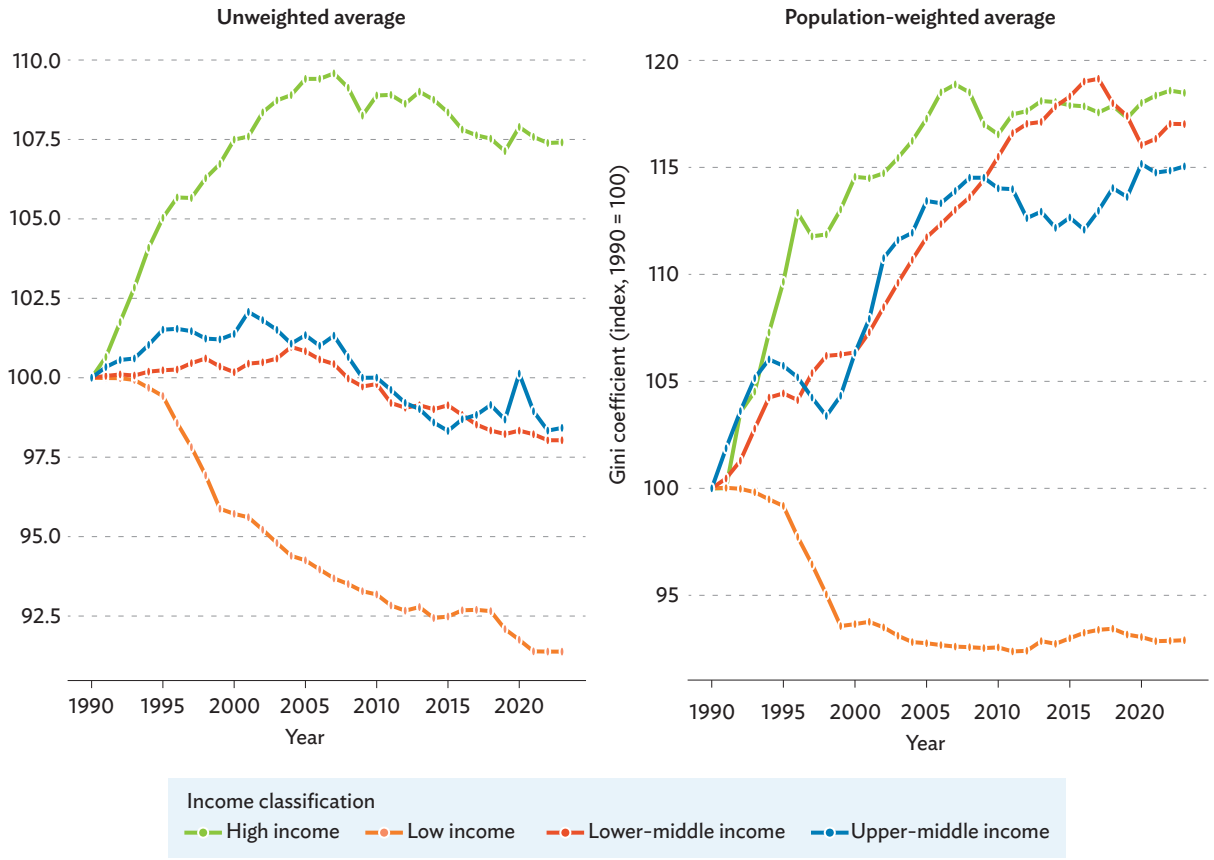
reports the evolution of the Gini coefficient by income level over the period 1990-2023, reporting both an unweighted and population weighted version of the index. The unweighted version of the index aligns well with the results in Figure 7.5, showing that rising inequality has been largely confined to high-income economies, with relatively large declines in the Gini coefficient for low-income economies. The figure also highlights that the rise of the Gini coefficient in high-income economies, as well as in lower-middle and upper-middle income economies, was largely confined to the period up to the global financial crisis, with the trend in inequality being downward in all income groups since then. Results when using a population-weighted average show rising inequality in high, upper-middle and lower-middle-income economies, highlighting that within the lower- and upper-middle-income groups, a subset of larger economies have seen increases in inequality.

Figure 7.5: Gini Coefficient in 1990 and 2023



Source: World Inequality Database

Figure 7.6: Evolution of the Gini Coefficient by Income Group, 1990-2023



Source: World Inequality Database

Taken together, these results add nuance to the conventional GVC-era inequality narrative. While between-economy inequality has fallen on a population-weighted basis, this appears to owe much to the performance of a few large economies, with the poorest showing little signs of convergence. Similarly, within-economy inequality has risen in many high-income economies but has remained stable or fallen in many lower income economies. Yet, this latter result hides variation in non-high-income economies, with a subset of often larger economies also seeing rising inequality.

These patterns raise questions about the extent to which the twin forces of GVC participation and technological change have been decisive drivers of inequality trends in recent decades, and whether their effects differ systematically across income levels, structural conditions and institutional contexts. The remainder of the chapter explores these possibilities by linking observed inequality patterns to productivity and distributional mechanisms associated with GVCs and technology.

7.3 Mechanisms: Global Value Chains, Productivity and Technology Diffusion

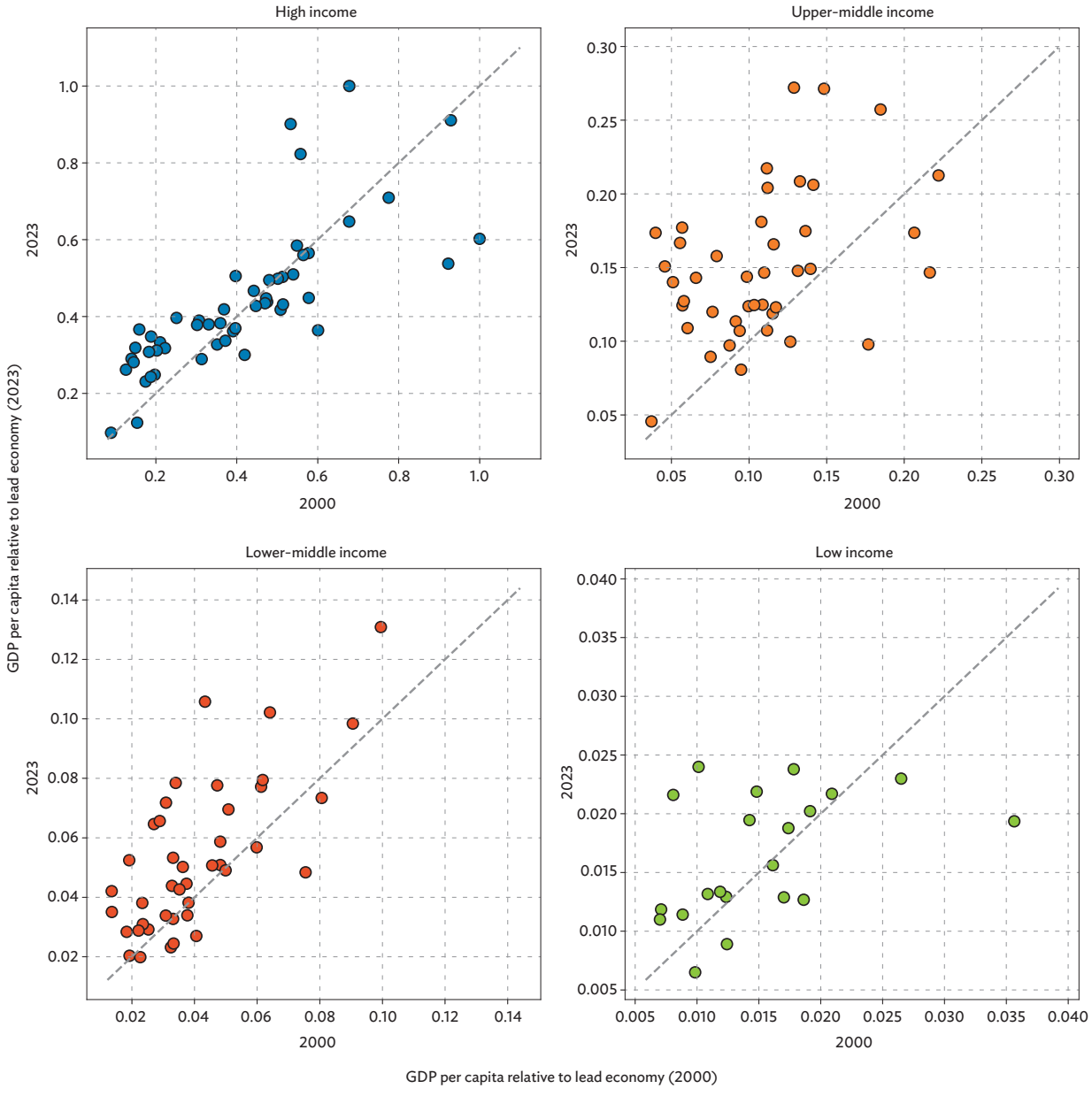
Since the turn of the century, there has been a general trend of between-economy convergence in per capita income. Figure 7.7 provides a visual representation of this phenomenon. The chart plots each economy's initial income level in 2000 (horizontal axis) against its subsequent average annual growth rate through 2023 (vertical axis). The downward-sloping trend line (in red dashes) demonstrates the core convergence dynamic: economies that started with lower income levels achieved higher growth rates, while those with initially higher incomes experienced more modest growth. The statistical relationship is significant ($p < 0.001$), confirming this general convergence pattern across the global economy.

Figure 7.7: Income Convergence Across Economies, 2000-2023

Source: World Bank's World Development Indicators

However, catch-up dynamics have been highly heterogeneous across economies at different income levels. Figure 7.8 illustrates this variation by showing catch-up dynamics across four income groups, with economies categorized by their 2023 income status. Each panel plots an economy's GDP per capita relative to that of the lead economy in 2000 (horizontal axis) against its relative GDP per capita in 2023 (vertical axis). The lead economy refers to the economy with the highest GDP per capita in the respective year (i.e., the richest economy in 2000 for the horizontal axis, and the richest economy in 2023 for the vertical axis). Points above the 45-degree line indicate that an economy has narrowed its income gap with the lead economy over the period.

Figure 7.8: Uneven Catch-Up Dynamics Across Income Groups, 2000-2023



Source: World Bank's World Development Indicators

The figure reveals two key dimensions of uneven catch-up dynamics across income groups. First, the dramatic scale differences among the four panels highlight the vast disparities in GDP per capita levels – low-income economies operate at income ratios of 0.01-0.05 relative to the lead economy, while high-income economies cluster at 0.4-1.0, illustrating the enormous development gaps that persist globally.

Second, catch-up effectiveness varies markedly by income level. While a substantial number of low-income economies appear above the 45-degree line, their actual convergence gains are minimal – most remain clustered near the bottom-left corner, suggesting persistent stagnation despite apparent catch-up potential. Lower-middle-income economies demonstrate modest but more meaningful progress, with several economies achieving noticeable convergence. Upper-middle-income economies exhibit the strongest catch-up performance, with multiple economies making substantial leaps toward the income frontier.

This heterogeneity reveals an important disconnect. While general convergence trends suggest catch-up opportunities exist globally, the actual convergence process is highly uneven across income groups. The evidence points to convergence mechanisms operating differently across development stages, with some economies facing particular barriers to translating growth opportunities into meaningful catch-up. The remainder of this section takes a closer look at the uneven catching-up process among lower-income economies, examining the underlying mechanisms by tracing the pathways through which GVC participation and technology affect productivity.

The analysis reveals that GVCs can serve as a powerful force for productivity convergence between economies, primarily through technology transfer mechanisms. However, simply participating in GVCs is insufficient to guarantee convergence benefits. The extent to which economies can harness these productivity gains depends critically on an economy's capacity to absorb and effectively utilize transferred technologies, including through an economy's positioning in GVCs. This differential capacity for technology absorption explains the structurally selective nature of GVC benefits and underlies the uneven convergence patterns observed across economies with varying levels of GVC integration.

This section is organized around three key questions. Firstly, how do GVCs enable productivity convergence, and how do these effects vary across sectors and development levels? Drawing on sector-level evidence, Section 7.3.1 shows that GVC integration accelerates productivity growth primarily through technology transfer, but the benefits depend critically on the type of linkages (forward vs backward), sectoral characteristics and network positions. This helps explain why GVC-driven convergence has been uneven, benefiting some participating economies while bypassing others.

Secondly, what are the micro-level mechanisms through which GVC participation transforms firm capabilities? Firm-level evidence discussed in Section 7.3.2 reveals

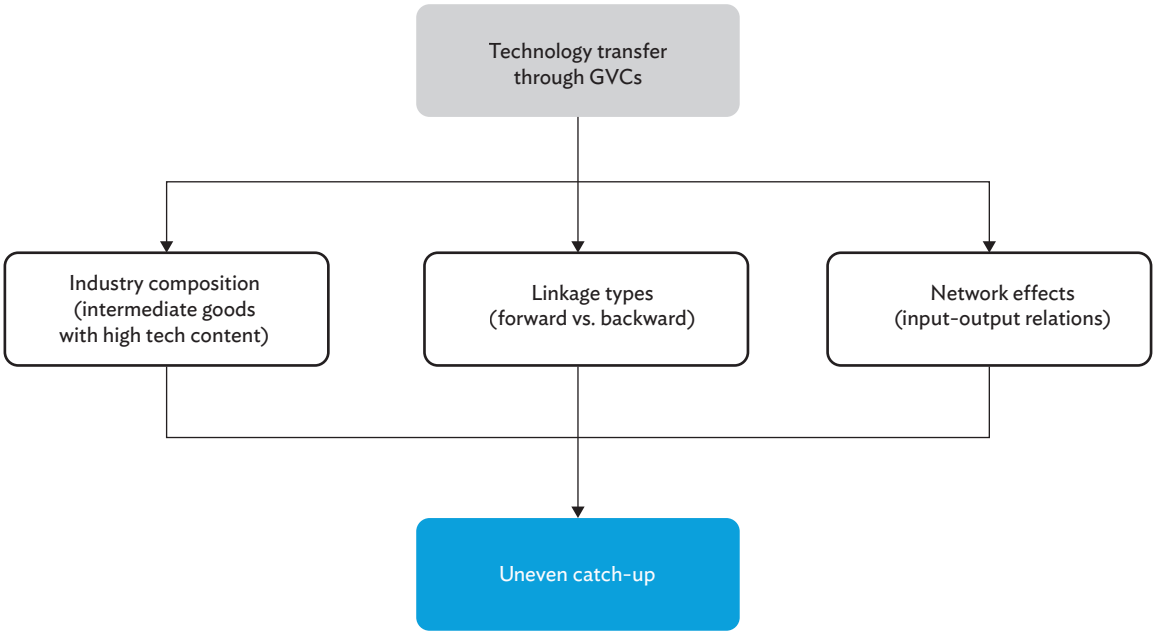
that benefits flow through specific relational channels – direct buyer support, network effects and knowledge spillovers – rather than broad market forces. Importantly, these gains are concentrated among initially less productive firms, suggesting GVCs work primarily through catch-up mechanisms rather than pushing frontier firms further ahead.

Thirdly, what structural features of GVCs make them such effective channels for knowledge transfer? Section 7.3.3 identifies how stable relationships and productivity interdependencies create powerful infrastructure and incentives for knowledge sharing. This impact also extends far beyond worker mobility and spin-off entrepreneurship.

7.3.1. Cross-Economy Evidence On Global Value Chain-Led Productivity Convergence

The aggregate-level evidence reviewed in this subsection helps explain why productivity convergence through GVCs has been uneven across economies and why benefits have concentrated among specific economies with particular structural characteristics. Rather than operating as a uniform force, GVC integration creates differentiated pathways for technology transfer and productivity growth that depend on how economies connect to global production networks and their underlying industrial composition (Figure 7.9).

Figure 7.9: Channels from Global Value Chains/Technology to Uneven Catch-Up Dynamics Across Economies



Source: Authors

Technology Transfer through Global Value Chains: Evidence for Productivity Convergence

In a background paper to this report, Foster-McGregor (2024a) shows that GVC integration accelerates productivity convergence across economies. Analysing Asian Development Bank (ADB) multi-region input-output data from 2007-2018, the study demonstrates that economies with higher GVC participation rates experience faster labor productivity growth, likely through technology adoption and process improvements that help participating economies catch up with global leaders.

Taking a longer historical perspective, Pahl and Timmer (2020) find that economies further behind the global productivity frontier benefit the most from global value chain participation. The study also finds that gains from GVC participation are particularly pronounced in industries that rely on sophisticated intermediate inputs such as electronics and transport equipment, where the technology content of traded goods is the highest. These results support the technology transfer mechanism: lagging economies gain access to superior technologies and organizational practices through GVC relationships.

The Critical Role of Linkage Types and the Threshold Effects

Foster-McGregor (2024a) reveals that the type of GVC linkage fundamentally determines both the speed and sustainability of these productivity gains. Forward linkages – where domestic production becomes inputs for other economies' exports – lead to more rapid productivity convergence even at relatively low levels of integration. These linkages facilitate continuous learning through exposure to international quality standards and buyer feedback, creating steady channels for capability upgrading that do not require massive initial investments.

Backward linkages – importing intermediate inputs for domestic production – show a more complex pattern. While backward linkages also enhance productivity convergence, they require higher participation levels to achieve more rapid convergence. Once past this threshold, however, the convergence bonus is relatively strong. As a result, the benefits in terms of convergence of GVC integration can be more easily obtained through forward GVC participation.

Global Total Factor Productivity and Compounding Network Effects

The uneven benefits of GVC participation on productivity growth depend not only on the type of linkages (forward vs. backward) but also on where economies are positioned within global production networks and their specific roles in these networks.

In a background paper to this report, Cheng, Fukao and Meng (2024) introduce a concept of "global total factor productivity", or global TFP, which measures the residual growth of final outputs of an economy sector that cannot be accounted for

by the growth of primary inputs – not only in the final production stage, but across all previous stages within the GVCs.

This concept highlights a fundamental shift in how productivity gains propagate in a GVC-integrated world: economic benefits from productivity improvements are no longer confined to the innovating economy alone. When one economy improves its productivity, the effect not only affects its direct trading partners but also ripples through GVCs via changes in the prices of goods and services, ultimately affecting the terms of trade and welfare of all other economies.

The magnitude and direction of these indirect effects are determined by the specific pattern of input-output relationships between all economies. Consequently, integration into production networks does not automatically translate into equitable welfare improvements across all economies. Rather, it can create winners and losers that depend on economies' positions and roles in international production networks. Remarkably, these indirect effects are found out to be quantitatively larger than their direct counterparts in general and appear to be more resilient to trade disruptions.

This network-dependent distribution of benefits can be further reinforced by innovation dynamics. Evidence from Ito et al. (2023) shows that network centrality – measured by access to customers directly and through value chains – correlates strongly with innovation outcomes, as firms with greater network access file significantly more patent applications. This evidence suggests a potential compounding effect, where economies that capture disproportionate productivity gains from their network positions may also develop superior innovation capabilities, making the uneven benefits of GVC participation self-reinforcing over time.

Summary: The Uneven Nature of Global Value Chain-Led Convergence

The evidence discussed in this subsection reveals the potential role of technology transfer in GVC-led productivity convergence, as well as why the catch-up process has been uneven in nature. A key insight emerges: GVC benefits are structurally selective, favouring economies with particular industrial compositions, GVC linkage types and network positions.

This selectivity highlights the central role of domestic absorptive capacity in determining whether GVC participation translates into meaningful productivity improvements. Indeed, these structural characteristics all reflect underlying differences in economies' ability to absorb and diffuse GVC-embedded technologies.

Having established these structural patterns, the section turns to firm-level evidence to understand the specific mechanisms: How exactly do individual firms absorb knowledge from their GVC partners, and which types of firms benefit the most?

7.3.2. Micro-Level Mechanisms: How Global Value Chain Participation Transforms Firm Capabilities

Firm-level evidence reveals two key mechanisms through which GVC participation drives productivity convergence: (1) direct knowledge transfer from lead firms and (2) network effects that expand market access. In a background paper to this report, Ma et al. (2024) also find that, perhaps most importantly for convergence, GVC participation for emerging economies primarily helps struggling firms catch up rather than pushing already-successful firms further ahead.

Direct Knowledge Transfer through Buyer-Supplier Relationships

When domestic firms begin supplying multinational corporations (MNCs), they do not just gain new customers – they gain access to global knowledge networks. Alfaro-Ureña, Manelici and Vasquez (2022) provide compelling evidence on how joining GVCs transforms domestic firms through direct knowledge sharing. Tracking nearly every firm in Costa Rica between 2008 and 2017, they find that after supplying to a MNC for the first time, domestic firms typically hire more workers and achieve higher productivity within four years. While there is often a short-term dip in sales to domestic customers, these sales rebound and grow by about 20% over four years. Crucially, this growth comes from sales to "better" buyers with stronger market positions and longer-term relationships.

The mechanisms behind this transformation are revealing. Nearly half of Costa Rican suppliers (44%) reported receiving direct support from MNC buyers, including shared blueprints, on-site audits and hands-on operational advice. One business owner described gaining access to a "global catalogue of best practices". Once firms successfully supply their first MNC, benefits compound: 78% found it easier to win contracts with other MNCs, creating a virtuous cycle of capability growth and market reputation.

Network Effects and Relationship Capabilities

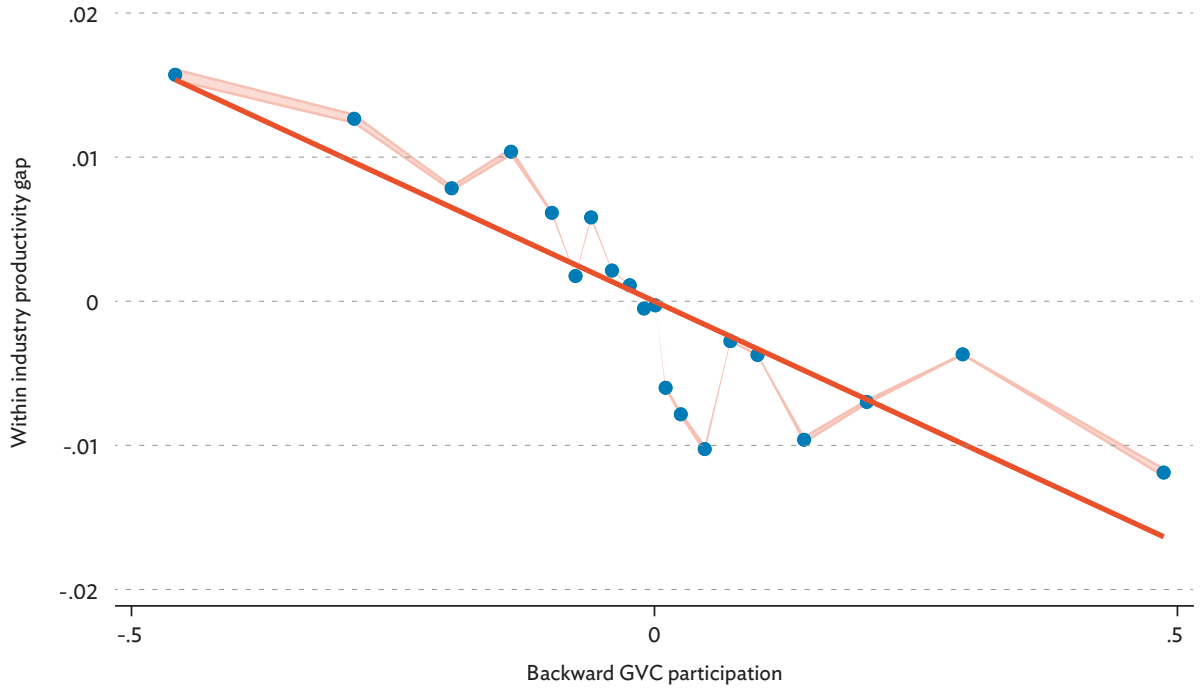
Amiti et al. (2024) examine whether these benefits depend specifically on multinational status by studying "superstar" firms in Belgium, where many leading firms are domestic rather than foreign. Their findings suggest that multinational status matters less than market position: domestic firms that begin supplying to any superstar firm – whether multinational or domestic – see productivity rise by about 8% within three years, along with growth in output, employment and international trade activity.

A key insight is what Bernard et al. (2022) term "relationship capability" – the ability to manage multiple customer relationships effectively. Superstar firms appear to transfer some of this capability to their suppliers, helping them reach new customers. Network effects amplify these benefits, as suppliers often gain access to buyers within the superstar's own customer base.

Industry-Wide Productivity Convergence

The paper of Ma et al. (2024) examines firms from the PRC from 2000-2013 and finds that doubling a firm's GVC participation reduces its productivity gap relative to industry leaders by 3.5 percentage points (Figure 7.10). Crucially, these gains are concentrated among the least productive firms – the bottom quarter sees marked improvements, while gains for already-productive firms are smaller (Figure 7.11).

Figure 7.10: Conditional Correlation Between Backward Global Value Chain Participation and Within-Industry Productivity Gap

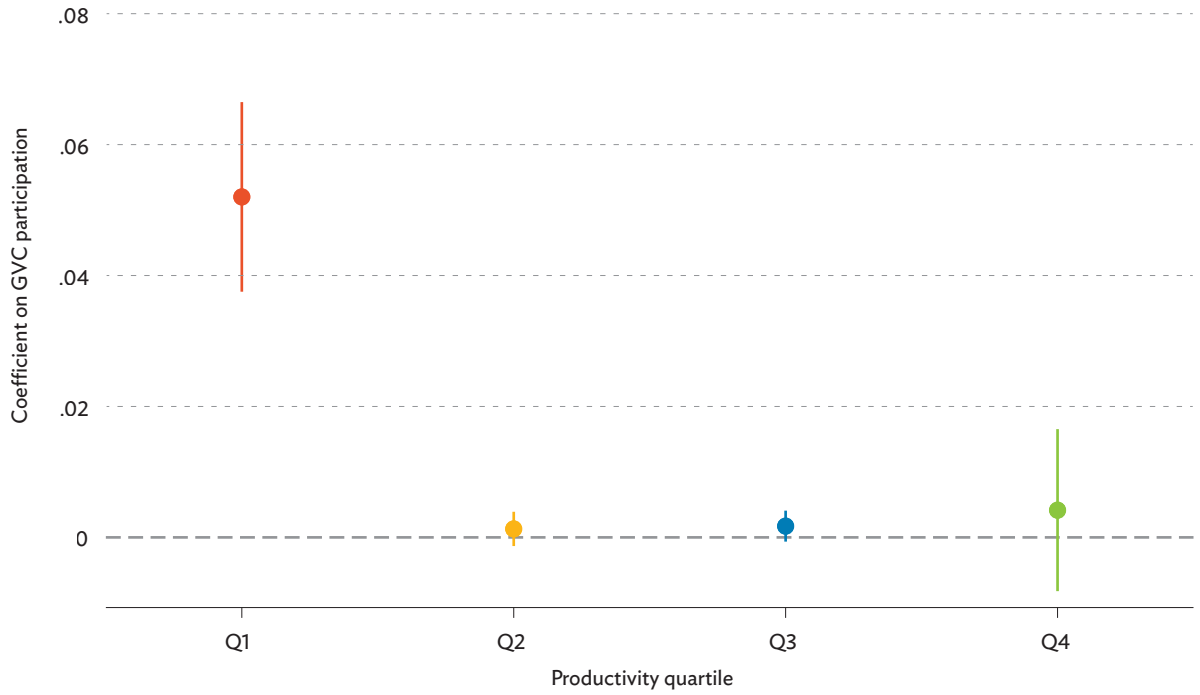


Note: The figure reports the conditional correlation between backward GVC participation at the firm level and the within-industry productivity gap (i.e., the productivity difference between the firm and the highest level in the industry). To control for firm-specific characteristics and time trends, both variables are first regressed on firm and year fixed effects, with the residuals from these two regressions then plotted. For better visualization, firm-level observations are grouped into 20 bins based on GVC participation levels, with each point representing the mean within bins.
Source: Authors

This pattern explains why GVC integration drives industry-wide productivity convergence for emerging economies. Rather than creating a few superstar firms pushing the productivity frontier, GVC participation appears to work by bringing lagging firms closer to best-practice standards through knowledge transfer and capability building.

These firm-level findings raise a natural question: what makes GVCs such effective channels for knowledge transfer and capability building? The answer lies in the fundamental structure of GVCs themselves – how they organize relationships between firms and create incentives for knowledge sharing that go far beyond traditional trade relationships.

Figure 7.11: Estimated Relationship Between Global Value Chain Participation and the Level of Productivity



Note: The figure reports estimated coefficients (and 95% confidence intervals) from regressions of productivity levels on backward GVC participation, firm age, age squared, capital-labor ratio, liability-asset ratio, government subsidy-sales ratio, and firm and year fixed effects. Separate regressions are estimated for each productivity quartile (Q1-Q4), where Q1 represents the lowest productivity quartile.
Source: Authors

7.3.3. The Architecture of Knowledge Transfer in Global Value Chains

GVCs function as sophisticated knowledge-sharing networks because of two structural features that distinguish them from traditional trade: stable, specialized relationships that enable tacit knowledge transfer, and productivity interdependencies that create strong incentives for active knowledge sharing. Combined with worker mobility and spin-off entrepreneurship, these two features transform GVCs into mechanisms for systematic technology transfer that extend far beyond direct participants.

Stable Relationships Enable Deep Knowledge Transfer

Unlike spot markets characterized by anonymous, transactional exchanges, GVCs are built on stable, long-term partnerships between firms engaged in highly specialized activities (Nunn, 2007; Kano, Tsang and Yeung, 2020). These enduring partnerships facilitate smoother knowledge flows across firms and, crucially, enable the transfer of tacit knowledge that typically requires repeated, trust-based interactions (World Bank, 2019; Piermartini and Rubínová, 2022).

The fragmentation of production into specialized tasks creates multiple touchpoints for learning. When firms simultaneously source inputs from and sell outputs to international supply chains, knowledge spillovers are particularly strong. Importantly, these benefits extend well beyond technological frontiers – middle-income economies gain significantly from foreign research efforts as GVCs have made knowledge diffusion less geographically constrained.

Productivity Interdependence Creates Sharing Incentives

The second key feature is that productivity complementarities along value chains create powerful incentives for knowledge sharing. When firms are interdependent within a production network, the productivity of each participant affects the performance of the entire chain. This gives lead firms – who coordinate and orchestrate these networks – strong incentives to actively support knowledge diffusion among their partners (Baldwin and Lopez-Gonzalez, 2015).

This represents a fundamental shift from traditional competitive dynamics. Rather than hoarding knowledge to maintain advantages, lead firms benefit from sharing expertise to eliminate bottlenecks and enhance overall network performance. The result is active technology transfer and capability building that goes far beyond what market forces alone would generate.

Knowledge Spillovers Beyond the Network

The impact of knowledge transfer extends well beyond direct participants through worker mobility and entrepreneurship. Bangladesh's garment industry transformation in the 1980s illustrates this multiplier effect (Rhee, 1990; Mostafa and Klepper, 2018; Verhoogen, 2023). In 1979, Bangladeshi company Desh Garment partnered with the conglomerate Daewoo from the Republic of Korea, sending 130 employees for six-month training in the Republic of Korea. Though the partnership ended in 1981, Desh's exports grew at over 90% annually, reaching $5 million by 1986/87.

Beyond Desh's own success, the real transformation came through spillovers. Trained workers who left Desh established new firms and trained additional workers, catalyzing industry-wide growth. Within a decade, Bangladesh expanded from a handful of garment manufacturers to 664 firms by 1988, demonstrating how GVC-initiated knowledge can multiply through labor mobility and spin-off entrepreneurship.

7.3.4. The Convergence-Divergence Paradox

While the discussion above suggests the potential for GVCs and technology diffusion to drive convergence between economies, these same mechanisms can simultaneously create inequality among them. GVC participation promotes knowledge diffusion and human capital accumulation that helps level the playing field internationally. However,

due to the structurally selective nature of GVCs, not all economies that participate in GVCs would benefit equally, potentially resulting in the uneven catching-up process observed among lower-income economies.

This structurally selective nature of GVCs generates inequalities not only between economies but also manifests within domestic economies. Pahl and Timmer (2020), for example, highlight a crucial tension between productivity convergence led by GVC participation and employment growth. They find that the presence of productivity gains from GVC participation do not generally translate to employment growth. The primary reason for this is that GVC production often involves adopting advanced, labor-saving technologies. To meet the high-quality standards of global markets, firms must rely on automation and capital-intensive processes, which reduce the demand for the abundant, low-skilled labor that emerging economies possess. Therefore, while a small number of highly skilled jobs may be created, the technology is ultimately better at substituting for workers than at creating mass employment opportunities.

This productivity-employment disconnect exemplifies how GVC integration can create distributional challenges within economies. The next section moves beyond convergence patterns between economies to inequality dynamics within them, examining how GVC-led technology transfer affects the functional distribution of income (i.e., labor vs. capital), within labor income distribution (i.e., skills, polarization, gender and vulnerable groups), firm heterogeneity (i.e., superstar vs. micro, small and medium-sized enterprises, or MSMEs) and ultimately regional inequality (i.e., urban/export hub vs. periphery).

7.4. Inequality, Labor Markets Global Value Chains and Technology

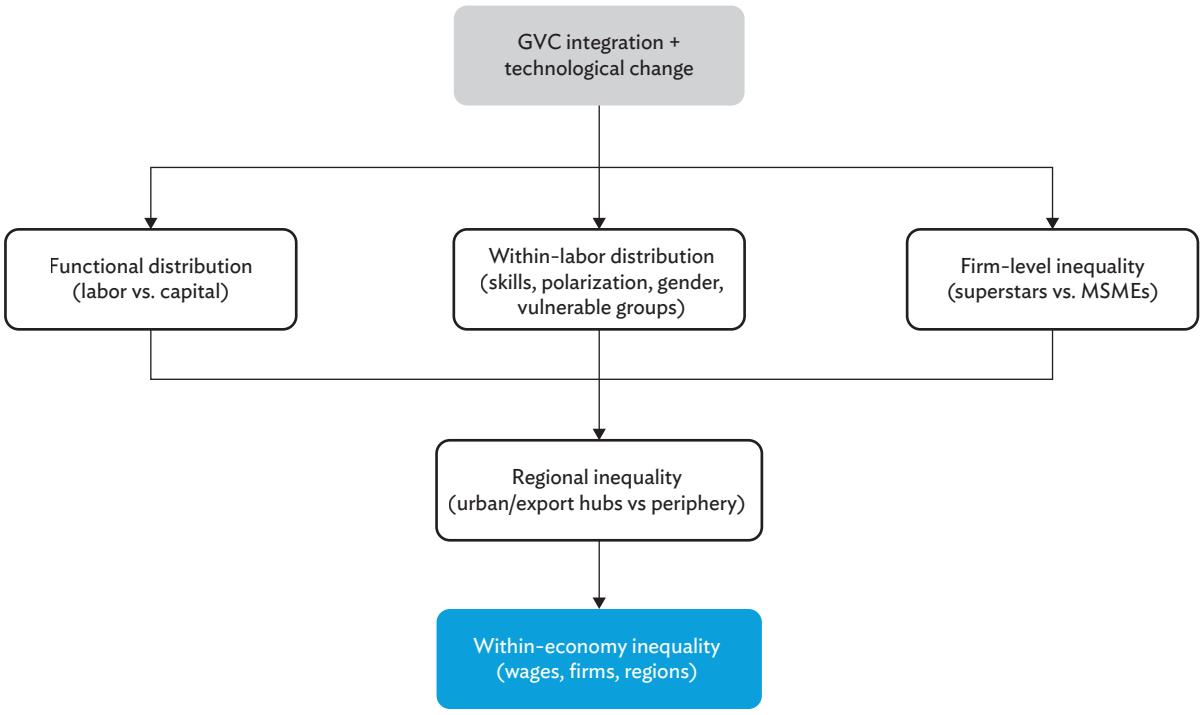
While GVCs and technological change, at least under certain conditions, have benefited productivity and fostered economic convergence across economies, their distributional consequences remain more contested. Productivity gains at the aggregate level may mask uneven effects across factors of production, worker type, firms and regions. In some cases, GVC integration and digital transformation may expand opportunities and raise incomes; in others, they may reinforce existing divides and shift value away from labor. This duality reflects the asymmetric ways in which the benefits of globalization and innovation are distributed across firms, workers and regions. The interaction between GVCs and technological change generates both opportunities and risks for inclusive growth. On the one hand, GVC participation can stimulate employment, skill development and wage growth – especially when domestic firms successfully upgrade and move into higher value-added segments. On the other hand, both GVCs and technology can exacerbate labor market inequalities by displacing workers in routine tasks, concentrating gains among skilled workers or large firms, and reinforcing geographical divides.

To unpack these dynamics, this section examines the main channels through which GVCs and technology shape inequality (Figure 7.12). Four dimensions stand out:

1. The functional distribution of income – shifts in the demand for and returns to capital and labor
2. Labor market effects – shifts in skill demand, job polarization and distributional patterns by gender, informality and worker vulnerability
3. Firm-level heterogeneity – the rise of superstar firms, pressures on MSMEs and uneven regional gains
4. Regional inequality – how effects due to the functional distribution, labor market effects and firm heterogeneity spatially manifest themselves

Together, these perspectives highlight both the risks of unequal outcomes and the conditions under which GVCs and technology can foster more inclusive growth. The section concludes by discussing how the new wave of automation may interact with GVCs to influence future inequality dynamics.

Figure 7.12: Channels From Global Value Chains/Technology To Within-Economy Inequality



Source: Authors

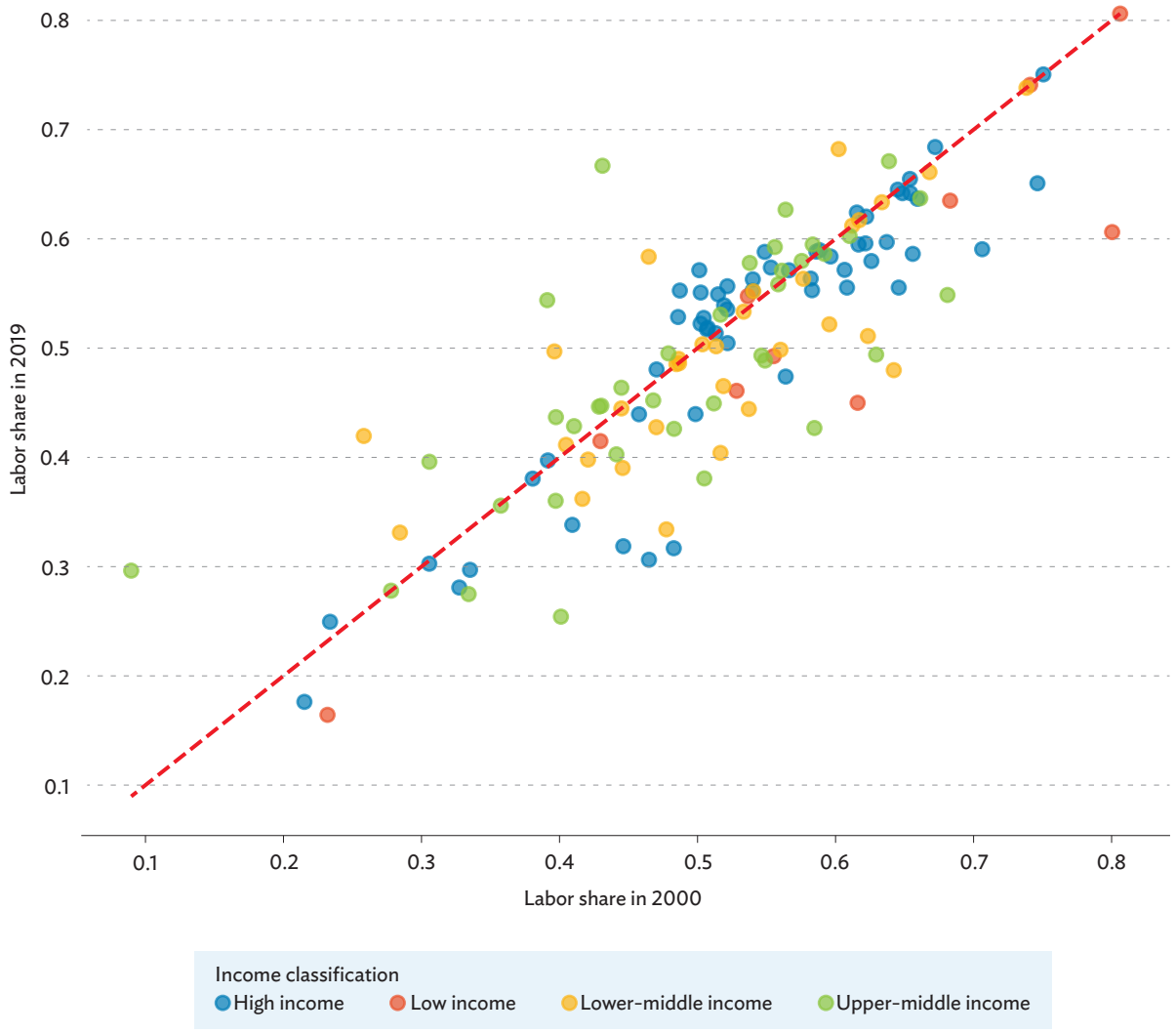
7.4.1. The Functional Distribution of Income

GVCs and technological change can combine to impact the functional distribution of income between capital and labor. Since the functional income distribution represents a major driver of personal income distribution (Daudey and Garcia-Penalosa, 2007;

Atkinson, 2009; Wolff and Zacharias, 2013; Coveri and Pianta, 2022), changes in the wage share due to the combined forces of GVCs and technological change can be an important driver of within-economy inequality.

Consistent with a longer run trend of declining labor shares, the GVC era has seen declines in labor shares across a range of developed and developing economies (Kheng, Mckinley and Pan, 2023; Harrison, 2024). Figure 7.13 reports data from the Penn World Tables on the change in the labor share between 2000 and the latest year in the dataset, 2019. The figure reveals that despite a great deal of heterogeneity, labor shares in 2000 were higher than those in 2019 in a majority of economies at all income levels.

Figure 7.13: Changes in Labor Shares Between 2000 and 2019



Source: Penn World Tables version 10.0 (Feenstra, Inklaar and Timmer, 2015).

The potential for GVCs to impact on the labor share is strong, with GVC integration increasing competitive pressures and incentivizing firms to contain labor costs by limiting wages or job losses. Offshoring labor-intensive tasks (e.g., assembly activities) from capital-abundant to labor-abundant economies also entails a higher capital-output ratio in the former, reducing the labor share in developed economies to the extent that capital acts as a gross substitute for labor (Harrison, 2005; Elsby, Hobijn, and Sahin, 2013; Helpman, 2016; Dao, Das and Koczan, 2020). This mechanism is central to the model of sequential production in GVCs of Sposi, Yi and Zhang (2021). They show how reductions in trade barriers lead to a reallocation of relatively upstream capital-intensive activities to relatively capital-abundant economies, highlighting that this technology effect of GVCs may be felt more strongly in developed economies.

In addition, by allowing for a greater substitutability of workers, GVCs can create the threat of tasks being offshored to other economies, with potentially negative consequences for worker bargaining power that can result in reduced wage shares and rising inequality in both developed and developing economies (Rodrik, 1997; Choi, 2001; Jeon, and Kwon, 2021; Coveri and Pianta, 2022; Guschanski and Onaran, 2023).

The interaction between GVCs and technology can be a further important driver of changes in the labor share. GVCs facilitate the diffusion and adoption of technologies, leading to capital-augmenting technological change that can have negative consequences for labor. Technological adoption and diffusion – particularly capital-augmenting forms such as robotics – can shift income toward capital, reducing labor's share (Karabarbounis and Neiman, 2014), especially when worker bargaining power is weak.

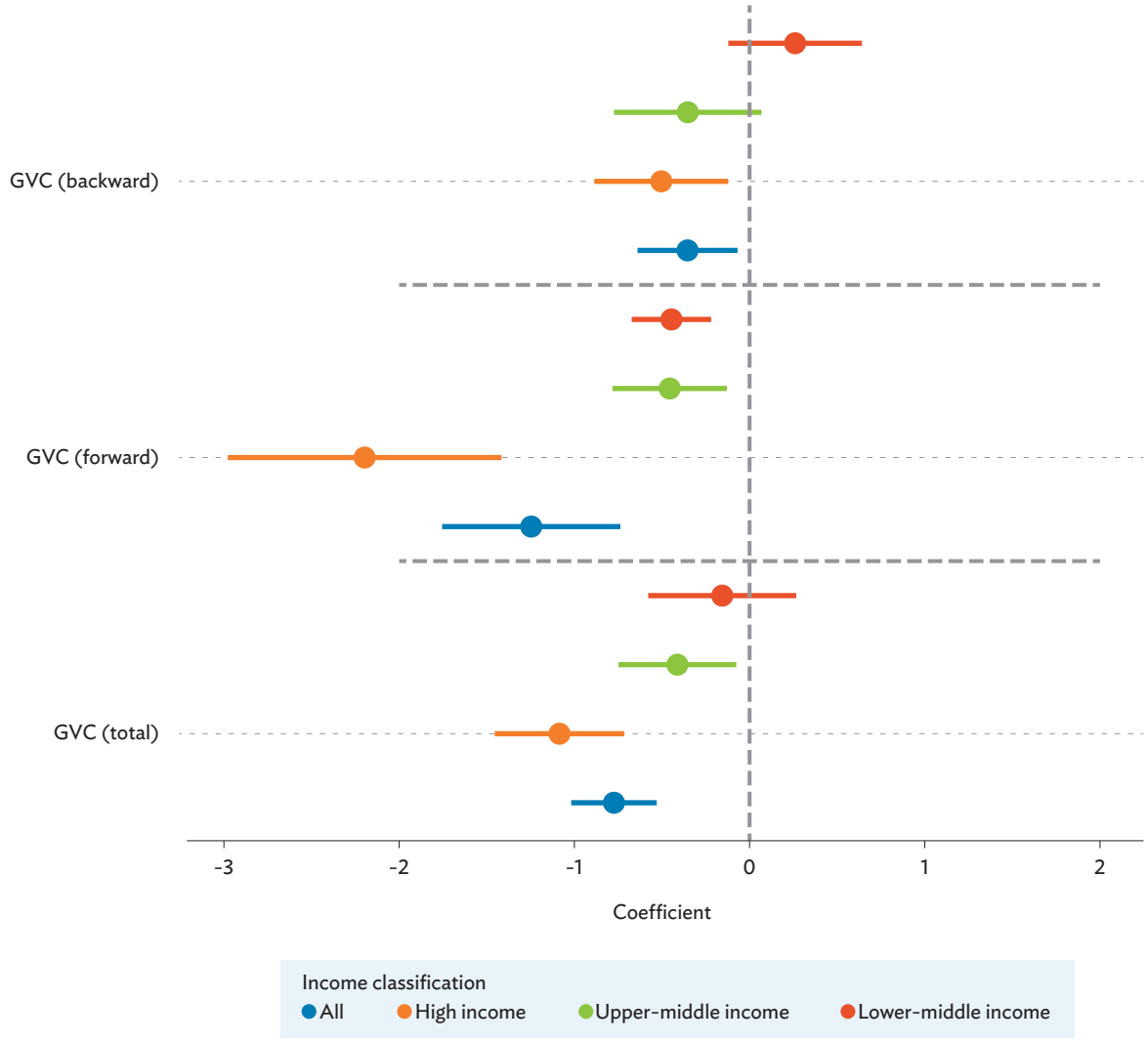
Recent evidence considering the relationship between GVC integration and the functional distribution of income shows that GVCs can negatively impact upon the labor share, but that the effects are heterogeneous and dependent upon the type of GVC integration. Riccio, Dosi and Virgillito (2023), for example, show that GVC integration can negatively impact upon the labor share, with this negative impact associated with increases in functional specialization in fabrication and marketing functions of suppliers along the value chain, particularly in lower-income economies. Reshef and Santoni (2023) combine information on GVC positioning and functional specialization, finding that forward GVC participation is associated with an accelerated decline in the labor share, with this effect being particularly strong for fabrication functions. In contrast, increases in backward GVC integration are positively associated with changes in the labor share of research and development (R&D) functions.

In a background paper for this report, Foster-McGregor (2024b) extends the analysis of Reshef and Santoni (2023) to consider high, upper-middle and lower-middle income economies. This increase in economy coverage across income levels comes at the expense of having no functional information and an exclusive focus on labor shares in manufacturing sectors. Estimating the relationship between indicators of forward and backward participation in GVCs and the manufacturing labor share, he finds evidence

of a negative impact of GVC participation on the labor share, with this effect being higher for forward than for backward GVC linkages (Figure 7.14).

Effects are further found to vary by development level, with the negative effects of GVC participation on the labor share tending to be larger in high-income economies and often insignificant in lower-middle-income economies (Figure 7.14). Such results are consistent with rising inequality trends being more prominent in developed economies, as well as with the arguments above indicating that the capital and technology bias of GVCs can have more negative impacts on labor in high-income economies.

Figure 7.14: Estimated Relationship Between Global Value Chain Participation and the Change in the Labor Share



Notes: The figure reports estimated coefficients (and 95% confidence intervals) from a regression of the annual change in the labor share on the change in GVC participation (forward, backward and total GVC participation), the ratio of robots to employment, economy, sector and time fixed effects.
Source: Authors' calculations

The paper of Foster-McGregor (2024b) further examines the interaction between GVCs and technology and its influence on the labor share. The paper shows that an increase in the share of robots per worker is associated with lower wage shares, suggesting a direct effect of automation on the wage share. Moreover, evidence presented in the paper suggests that GVC participation, notably forward GVC participation, is further associated with higher ratios of robots per worker. This latter result suggests that GVCs impact the labor share both directly and also by increasing the rates of automation, with these effects more common in, and often limited to, high-income economies.

In sum, the evidence suggests that GVCs and technological change have exerted downward pressure on labor's share of income, particularly in high-income economies and especially through forward linkages and capital-intensive technologies such as robotics. These aggregate shifts in the functional distribution matter because they shape the overall division between capital and labor. They also point to a broader challenge: the capacity of GVCs and new technologies to redistribute value unevenly across economies, sectors and worker groups.

7.4.2. Labor Market Effects

Impacts within labor markets remain the most immediate channel through which GVC participation and technological change are likely to affect inequality. Beyond changes in the functional distribution of income, the literature emphasizes skill-biased demand and job polarization as potential explanations for why productivity gains associated with GVCs and technology may not automatically translate into broad-based income growth. Wang and Yin (2015), for example, provide a useful theoretical lens, showing that international technology transfers – an intrinsic feature of GVCs – shift relative wages depending on whether the transferred technology benefits skilled- or unskilled-intensive sectors. If productivity rises in skill-intensive sectors, the skilled wage premium increases, whereas productivity gains in unskilled sectors can narrow inequality.

Indeed, the link between GVC participation and labor markets has been the theme of past *GVC Development Reports* (Bacchetta and Stolzenburg, 2019; Hollweg, 2019; Park, Lundquist and Stolzenburg 2023). Considering the impacts of GVCs on labor markets in advanced economies, Bacchetta and Stolzenburg (2019) note that while the overall contribution of GVC integration to declining manufacturing jobs in advanced economies is limited, it has led to job losses in certain sectors and regions. Demand for labor has also shifted towards higher-skilled workers, leaving low-skilled workers at a disadvantage and encouraging wider income disparities.

Hollweg (2019) emphasizes that GVCs have facilitated economic integration of lower-income economies, offering new avenues for growth and industrialization. She also highlights, however, that the benefits have not been distributed evenly. Integration of lower-income economies into GVCs has tended to be skill-biased, with demand for

skilled labor increasing often at the expense of low-skilled workers. This contrasts with theory, which would suggest an increase in demand for unskilled workers in labor-abundant lower-income economies (Baldwin and Evenett, 2015). This paradox of GVCs reallocating tasks to increase the demand for higher-skilled workers in both high- and lower- income economies can be explained if the activities received from global lead firms are more skill-intensive than domestic averages, resulting in a rising skill premium (Feenstra, 2007). Through their role in diffusing technology, GVCs have further led to the displacement of workers in traditional sectors through automation and digital technologies, effects that fall disproportionately on low-income and less-skilled workers.

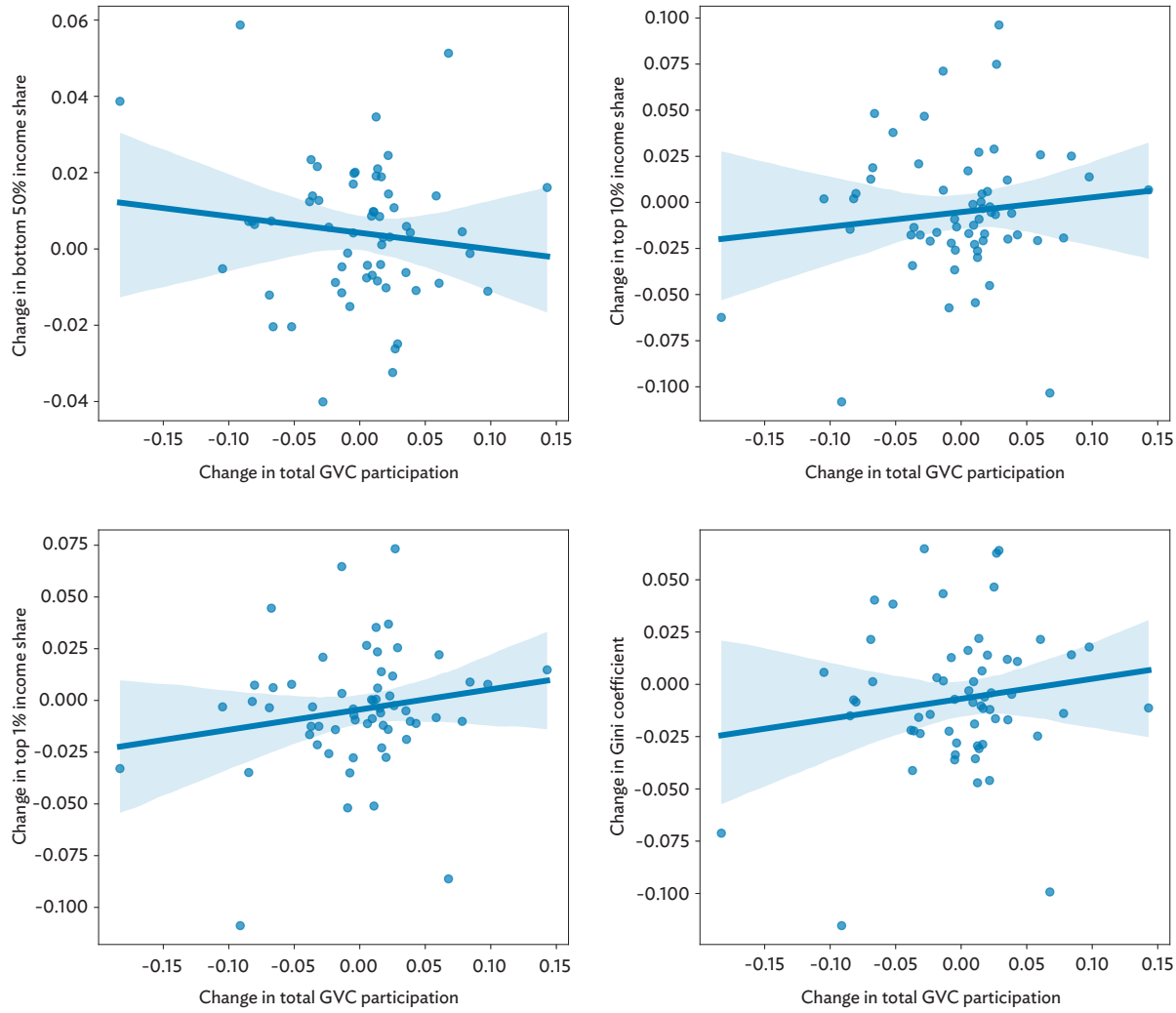
Beyond differences by skill, labor market outcomes are also mediated by structural characteristics such as gender, age and employment formality. Women remain concentrated in export-oriented industries that are labor-intensive but low paid, such as apparel, electronics assembly and agribusiness. While these sectors often provide entry into wage employment, they offer limited opportunities for upgrading and are highly exposed to global demand fluctuations (see, for example, Barrientos and Kabeer, 2004; Kalliny and Zaki, 2024). Young workers, meanwhile, are more likely to enter GVCs through routine or precarious occupations that provide limited career progression (ILO, 2017). Informality is another persistent feature, especially in developing economies where GVC integration often relies on informal subcontracting and home-based production (see, for example, Tartanoğlu, 2017). This weakens the transmission of productivity gains to workers and restricts access to social protection. These distributional patterns suggest that the inequality effects of GVCs operate not only through skill bias, but also through the segmentation of labor markets along gender, generational and formality lines.

In the *2023 GVC Development Report*, Park, Lundquist and Stolzenburg (2023) extend this perspective by showing that while GVC participation has improved employment opportunities, these are often concentrated in low- or medium-skilled, informal or precarious jobs, limiting the inclusiveness of gains. They further show that gender gaps persist in GVC trade, with women overrepresented in lower-paid, lower-skilled roles in export-oriented firms, while shocks such as COVID-19 or trade tensions tend to hit vulnerable groups hardest – low-skilled, informal and female workers, in particular – with uneven recovery trajectories.

The evidence presented in previous reports is thus mixed and suggests that any effects on labor market outcomes and on aggregate inequality trends are likely to be heterogeneous and depend on structural characteristics of the economy in question. Such arguments also suggest that aggregate level evidence of a relationship between inequality and GVC participation may be limited, something confirmed by casual evidence (see Figure 7.15) and recent literature. Carpa and Martinez-Zarzoso (2022), for example, find that backward participation increases inequality in developing economies in the short run, while the long-run effect is to reduce inequality. Results

for forward GVC participation tend to be insignificant. Gonzalez, Kowalski and Achard (2015) find limited evidence of a relationship between GVC participation and wage distributions, though some evidence of GVCs reducing wage inequality among the low-skilled segment of the labor force is found. Duarte et al. (2022) find evidence of a U-shaped relationship between an indicator of GVC positioning and inequality for a sample of 67 economies over the period 1995-2018. These results thus suggest that intermediate positions within GVCs can contribute to reduced inequality, while positioning in the tails is associated with higher inequality, perhaps related to the biased nature of labor demand in the tails.

Figure 7.15: Relationship Between Changes in Global Value Chain Participation and Indicators of Income Inequality



Notes: GVC participation is calculated using the methodology of Wang et al. (2017), with the GVC participation rate being the average of the forward and backward GVC participation rates. To control for the effects of economy size in influencing GVC participation rates, the change in GVC participation rate is the change between 2007 and 2023 in the residuals of a regression of the GVC participation rate on the log of GDP.

Source: World Inequality Database, ADB Multi-region input output tables

More recent evidence addresses this heterogeneity in several ways. Lewandowski, Madoń and Winkler (2024) find that GVC participation can impact within-economy wage inequality through two distinct channels. The direct effect operates through GVCs' influence on workers' wages – for example, by changing relative pay across occupations and sectors. The indirect effect works through GVCs' impact on the routine task intensity (RTI) of jobs, since more routine, offshorable work tends to pay less. Workers in offshorable occupations tend to work in more routine intensive work, especially in developing economies – a relationship that is strongest in tradable sectors. Since a higher RTI is associated with lower wages, GVC participation indirectly increases wage inequality. The direct effect of GVC participation, however, serves to reduce wage inequality in most economies. In emerging economies, the direct effect dominates the indirect effect, resulting in lower inequality, whereas in advanced economies the indirect effect dominates, with GVCs benefiting workers in non-offshorable occupations in tradable services.

The role of functions within global value chains in impacting inequality effects of GVCs is also considered by Coveri, Paglialunga and Zanfei (2024). They use data on foreign direct investment (FDI) by function to build indicators of involvement in different activities in GVCs, namely pre-production, production and post-production activities. They argue that inward FDI in knowledge-intensive functions can have varied effects on labor demand and wages. They may encourage structural changes in recipient economies towards better-paid jobs in new and high-growth sectors, which may be task- and skill-biased, raising skill premiums and increasing inequality (Hale and Xu, 2016; Bogliaccini and Egan, 2017). If upgrading in response to inward FDI is sufficiently widespread, however, then it may generate productivity gains that can benefit low-wage segments of the labor force, which in turn could reduce inequality. Their results suggest that larger shares of inward FDI in intangible-investment activities, particularly pre-production activities like R&D, are associated with lower inequality. As such, and in contrast to Duarte et al. (2022), engagement in activities at the ends of the value chain – i.e., upstream and downstream activities – is associated with lower income disparities.

Coveri, Paglialunga and Zanfei (2024) further consider indicators of GVC positioning and their relationship with inequality. They show that stronger forward linkages are negatively related to inequality in advanced economies but positively related in middle- and low-income economies. In other words, a more downstream position in GVCs is associated with higher income inequality in high-income economies. Conversely, a more upstream position in GVCs is associated with higher inequality in middle- and low-income economies, which it is argued may be due to the high levels of competition among intermediate input suppliers along with the concentration of profits in upstream industries providing commodity and energy materials.

7.4.3. Firm Level Heterogeneity

The distributional consequences of GVC participation are shaped not only by shifts between capital and labor, or across groups of workers, but also by heterogeneity among firms. GVC integration interacts with technological change to generate a sharp divergence in firm performance, with large, technologically sophisticated enterprises pulling away from smaller and less productive firms (Mattsson and Reshid, 2023).

A growing literature highlights the rise of "superstar" firms – large multinationals that combine scale, intangibles and global reach to capture an increasing share of value added and profits. These firms are best placed to exploit digital technologies, such as robotics and AI, which complement their organizational capabilities and intangible assets (e.g., Firooz, Liu, and Wang, 2025). The result is a concentration of productivity gains and rents among a narrow set of firms at the top of GVC hierarchies. This has direct implications for inequality: superstar dominance can reduce labor's bargaining power, suppress wage growth in supplier networks and limit the diffusion of technology and know-how to the broader economy (see, for example, Autor et al., 2020).

By contrast, MSMEs typically face higher barriers to upgrading and limited capacity to absorb new technologies. While digital platforms and e-commerce tools may lower entry costs by facilitating cross-border transactions or providing cloud-based services (Gopalan, Reddy and Sasidharan, 2022), evidence suggests that the benefits accrue unevenly (Marzi et al., 2023). MSMEs that are already relatively productive and digitally connected can expand their reach through platforms such as Alibaba or Mercado Libre (Pan et al., 2025). But many others remain locked into low-value segments of production networks, exposed to intense competition and vulnerable to shocks.

A further dimension is informality. In many developing economies, informal firms and workers are embedded in export-oriented value chains, often through subcontracting or casualized employment. While such linkages provide income opportunities, they rarely deliver productivity spillovers or access to upgrading, at least without building absorptive capacity (e.g., Djidonou, Foster-McGregor and Mathew, 2025). Informality thus becomes a mechanism by which the gains from GVC integration are diluted, with precarious work absorbing volatility while rents remain concentrated in formal lead firms. The coexistence of superstars, MSMEs and informal enterprises underscores how firm-level heterogeneity transmits the benefits and costs of GVC participation in highly unequal ways.

7.4.4. Regional Inequality

Regional inequality can be understood as the spatial manifestation of the dynamics already discussed at the level of production factors, workers and firms. GVC participation does not affect all places equally: it amplifies the advantages of regions

with concentrations of high-skilled labor, lead firms and complementary infrastructure, while leaving others behind (OECD, 2023a). Labor market polarization plays out geographically, as areas rich in routine-intensive manufacturing jobs are more exposed to automation and offshoring, while skill-intensive metropolitan regions capture new employment opportunities in high-value services.

Similarly, firm-level heterogeneity translates directly into uneven regional trajectories. Superstar firms cluster in global cities and specialized industrial hubs, where they benefit from agglomeration economies, innovation ecosystems and access to global networks (e.g., Crescenzi et al., 2018). By contrast, MSMEs and informal firms are often rooted in peripheral or rural areas, where limited infrastructure and weaker state capacity constrain their ability to upgrade. This divergence means that the distribution of economic activity across space is increasingly shaped by where "superstars" choose to anchor their operations versus where fragmented and vulnerable firms remain.

New technologies – AI, robotics, digital platforms – reinforce these divides. Regions with digital infrastructure, absorptive capacity and a skilled workforce can harness automation and platformization to integrate more deeply into GVCs. Others risk being bypassed by technological progress, with automation potentially eroding their traditional comparative advantage and digital divides preventing meaningful participation in new segments of trade. The resulting geography of globalization and technology is therefore highly unequal: some regions emerge as winners in the reorganization of global production, while others face marginalization or stagnation (Hartmann and Pinheiro, 2022; OECD, 2023a).

7.4.5. The Next Wave: Artificial Intelligence, Global Value Chains and Labor

Past waves of globalization and automation have reshaped labor markets largely through the offshoring of routine tasks, the rise of skill-biased demand and the concentration of value in globally integrated firms. The next wave of technological change – driven by AI, advanced robotics and digital platforms – carries the potential to both mirror and depart from these patterns in ways that could significantly alter the distributional consequences of GVC participation.[1]

Unlike earlier forms of automation that primarily targeted codifiable routine work, AI extends the technological frontier into non-routine cognitive tasks, reshaping not only the labor market but also the geography and organization of GVCs. Bekkers, Kalachyhin and Teh (2024), for example, show that AI may encourage GVCs through productivity growth and reduced trade costs, but also how the technology may exacerbate labor market polarization. High-productivity gains in capital- and skill-intensive services sectors such as finance, insurance and business services disproportionately benefit already-skilled

[1] This discussion is based on the background paper for the *GVC Development Report 2025* of Bastos (2024).

workers and capital owners. Meanwhile, sectors with low AI exposure or those in which labor replacement is feasible (e.g., routine manufacturing) may see job losses or wage suppression. Thus, while digitalization may reshape the geography of trade in ways that benefit some economies, it may also deepen within-economy inequality.

AI is advancing the scope of automation by complementing high-skilled, non-routine workers while increasingly displacing mid- and low-skilled cognitive roles that were previously insulated. Estimates by the OECD (2023b) suggest that 14-27% of jobs in member economies are highly automatable, with GVC-linked sectors such as logistics, electronics and business services among the most exposed. Task-based analyses show that while few occupations are entirely automatable, most contain tasks suitable for machine learning (Brynjolfsson and Mitchell, 2017), implying that AI is likely to restructure rather than fully eliminate jobs. The distributional risks of AI and automation are not uniform across worker groups. Evidence from developing economies shows that women and youth are disproportionately employed in routine-intensive occupations, leaving them more exposed to displacement and wage stagnation as AI and robotics diffuse (Pieters et al., 2025). Informal workers, who often lack access to training or digital tools, also face higher vulnerability to technological change. These patterns highlight that without targeted policies – skills development, inclusive training and social protection – automation and GVC-linked technological shifts may exacerbate existing inequalities within labor markets.

At the global level, AI and robotics may reconfigure the comparative advantages that have historically underpinned GVCs. Robot adoption has already been concentrated in automotive and electronics, but AI-enabled robotics are beginning to penetrate sectors such as textiles and pharmaceuticals that have traditionally relied on low-wage labor. This raises concerns about accelerating "premature deindustrialization" (Rodrik, 2016), as labor-intensive export models lose viability. Yet the productivity-enhancing effects of AI adoption in high-income economies may also expand demand and create new opportunities for emerging economies through trade and FDI (Artuc, Christiaensen and Winkler, 2019; Stapleton and Webb, 2020). Whether these forces crowd out or complement developing economies' participation in GVCs remains an open question.

AI also interacts with GVCs by lowering trade and coordination costs. Machine translation, predictive analytics and logistics optimization are reducing barriers to cross-border exchange and enabling more seamless integration of small firms into global production networks. For instance, eBay's introduction of AI-powered translation significantly boosted trade flows between the US and Latin America (Brynjolfsson, Hui and Liu, 2018). At the same time, the rise of platform-based GVCs introduces new asymmetries. Algorithmic visibility and reputation mechanisms often favour incumbent firms and performance outcomes can be driven more by algorithmic exposure than by underlying productivity (Chen and Xu, 2024). Without corrective policies, platformization may therefore deepen digital divides rather than democratize access to global markets.

The falling cost of intangible capital – data, software and AI capabilities – further tilts GVC participation toward firms and economies able to accumulate these assets. Zeng and Zhu (2024) argue that cheaper intangible capital can generate new jobs in knowledge-intensive segments of GVCs, but this upgrading potential is unevenly distributed. Lead firms and technologically advanced suppliers are best positioned to benefit, while smaller and less connected firms risk being locked into low-value tasks. Firm-level evidence already suggests that robot adoption is disproportionately concentrated among large, internationally connected enterprises (Artuc, Bastos and Rijkers, 2023), a pattern likely to intensify with the spread of AI.

These transformations will also carry uneven implications for workers across gender, age and informality. Women and youth are disproportionately concentrated in clerical, service and manufacturing roles that are highly automatable, while informal workers – lacking access to training and digital tools – face structural barriers to adaptation. By contrast, new opportunities in AI-enabled GVC segments such as design, R&D and digital services often require advanced skills and access to technology, creating risks of exclusion.

Taken together, these dynamics suggest that the distributional consequences of AI-GVC interactions will be highly uncertain and uneven. On the one hand, AI may deepen inequalities by displacing routine tasks, reinforcing firm-level concentration and eroding the labor-cost advantages of developing economies. On the other, it has the potential to expand trade, reduce coordination costs and create new upgrading opportunities for firms and workers able to adapt. The extent to which the next wave of technological change exacerbates or mitigates inequality will depend heavily on domestic conditions – education systems, training institutions, digital infrastructure and social protections – as well as on how global production networks themselves evolve in response to these frontier technologies.

7.5 Policy Responses – Harnessing Global Value Chains and Technology for Inclusive Growth

The chapter highlights a central paradox: GVCs and technological change can raise productivity and promote convergence between economies, but they can also deepen divides within them. Their effects on inequality are heterogeneous, often magnifying existing domestic strengths and weaknesses. This makes policy essential – not only for maximizing the productivity gains associated with GVC participation and technology adoption, but also for ensuring that those gains are distributed broadly. The central challenge is not whether economies integrate into GVCs or adopt new technologies, but how these processes are shaped so that they translate into inclusive growth.

On the productivity side, the evidence shows that GVC participation does not guarantee automatic benefits. Gains depend critically on economies' positions within global production networks and their domestic absorptive capacity. This suggests the need for a selective approach to integration. Rather than pursuing GVC participation indiscriminately, economies could focus on sectors and segments where they can build sophisticated capabilities. Smaller economies, which often lack the scale needed to reach threshold effects, may find regional value chains a useful stepping stone to global integration. At the same time, building the institutional and human capital foundations for absorptive capacity is vital. Without robust education, lifelong learning systems and vocational training, the knowledge and technology diffused through GVCs cannot be absorbed. Recent evidence shows that training programmes can reduce wage gaps in GVC-intensive sectors, underscoring the importance of skills development (OECD, 2023b). Strengthening R&D systems, digital infrastructure and innovation ecosystems also enables firms to adopt and adapt new technologies, while policies supporting small and medium-sized enterprises can help them meet international standards and link more effectively into GVCs. In this sense, sequencing can be crucial, with economies building capabilities before pursuing deeper integration once the conditions for sustained upgrading are in place.

Yet maximizing productivity is only half the story. Even where GVC-related gains materialize, they are often unevenly distributed – concentrated in capital-intensive sectors, specific regions or among higher-skilled workers. Ensuring that benefits spread more broadly requires a complementary set of inclusive policies. Because GVC participation is frequently associated with labor-saving technologies, governments could provide robust retraining, active labor market policies and portable social protection to help workers transition from declining sectors to emerging opportunities. Labor market regulations and practices, including minimum wages and collective bargaining and targeted support for vulnerable groups, including women and youth, can further cushion workers from volatility. Redistribution also plays a role: progressive taxation of GVC-participating firms, combined with investment of revenues into education, infrastructure and skills, can channel concentrated gains into broader national development. Spatial inequalities are another concern, as GVC benefits tend to cluster in core regions. Infrastructure investments, incentives for firms to locate in lagging regions and policies that facilitate worker mobility can help spread knowledge spillovers more evenly, while entrepreneurship programmes can extend GVC-related opportunities beyond immediate lead firms.

Finally, the governance of emerging technologies has become central to inclusive GVC participation. AI and digital platforms create powerful new opportunities but also risks of concentration and worker displacement. Policymakers may explicitly assess the labor market impacts of new technologies and adopt measures – through competition policy, fair taxation, open standards and technology transfer mechanisms – that prevent frontier innovations from being locked within a few lead firms. The strength of domestic institutions is critical here: economies with collective bargaining systems and

active labor market policies tend to experience more equitable outcomes from GVC and technology shocks, while weak institutional environments leave workers more exposed to polarization and declining labor shares.

In sum, successful GVC-led development requires moving beyond the assumption that participation alone delivers benefits. Productivity gains can be actively cultivated through strategic positioning and capability building, while inclusive outcomes depend on policies that diffuse and redistribute those gains across workers, regions and firms. Economies that manage this balance – harnessing GVCs and technological change for productivity while ensuring broad-based participation – will be best positioned to achieve convergence without falling into the trap of rising inequality.

7.6 Conclusion

Recent decades have seen the twin forces of GVC integration and technological change reshape the global economy. They have supported productivity growth and convergence between economies, but they have also introduced new fault lines within them. The evidence reviewed in this chapter shows that their effects are neither uniformly positive nor uniformly negative. Instead, they are deeply contingent on economy-specific institutions, firm structures, GVC positioning and policy environments.

Three broad conclusions stand out. First, GVCs and technology are not independent: they are mutually reinforcing. Technology has enabled the fragmentation of production, while GVCs serve as key channels of technology transfer. Second, the gains from this interaction are uneven. Aggregate productivity increases may mask widening divides across workers, firms and regions. Third, institutions matter. Where skills, infrastructure and social protections are strong, GVCs and technology can deliver broad-based gains; where they are weak, they may amplify inequalities.

For policymakers, the central challenge is not whether to participate in GVCs or adopt new technologies, but how to shape these processes so that they contribute to inclusive growth. This requires investments in human capital and absorptive capacity, support for MSMEs and vulnerable groups, and governance of emerging technologies such as AI to prevent concentration and exclusion.

Looking ahead, the policy debate must move beyond the binary of globalization and global value chains as opportunity or threat. The more relevant question is how economies can design strategies that harness GVCs and technology as engines of inclusive and sustainable development.

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