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GLOBAL VALUE CHAINS AND COMPETITIVE ADVANTAGE: UPGRADING STRATEGIES AND PERFORMANCE OUTCOMES

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Abstract. *Global value chains (GVCs) shape how firms compete by fragmenting production across borders and concentrating high-value activities (design, branding, advanced services) in specific nodes. Evidence suggests GVCs remain central to world trade-World Development Report 2020 notes that "almost 50% of global trade involves GVCs" and estimates that a 1% increase in GVC participation can raise per-capita income by more than 1%. Yet, participation alone does not guarantee better outcomes: performance depends on whether firms and clusters can "upgrade" into higher value-added tasks under specific governance structures. This article synthesizes core upgrading pathways-process, product, functional, and chain upgrading-and explains how each generates (or fails to generate) sustainable competitive advantage. Drawing on the GVC governance framework (buyer-driven vs supplier-driven modular/relational/captive/hierarchical structures) and value-added trade metrics (TiVA), the paper develops a results-oriented model linking upgrading strategy to measurable outcomes: domestic value added in exports, productivity, unit margins, resilience, and market diversification. The discussion highlights practical conditions enabling upgrading (capabilities, standards compliance, supplier ecosystems, logistics, skills, and innovation systems), as well as risks of "thin" upgrading (e.g., productivity gains without margin capture). Policy and managerial implications emphasize capability-building, supplier development, and*

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strategic positioning in GVC governance to convert participation into durable performance gains.

Keywords: *global value chains, upgrading, competitive advantage, governance, TiVA, domestic value added, functional upgrading, resilience*

Introduction

GVCs have redefined international competitiveness by splitting production into specialized tasks performed in different locations. Firms no longer compete only as standalone producers; they compete as participants in cross-border production networks where lead firms coordinate standards, technology, and market access. The scale of this phenomenon is large: the World Bank's World Development Report 2020 underscores that nearly half of global trade is linked to GVCs and that deeper participation can be strongly associated with income gains. More recently, UNCTAD's January 2026 global trade update stresses that nearly two-thirds of trade occurs within value chains and that these chains are being reshaped by geopolitical tensions, industrial policy, and new technologies-prompting firms to diversify suppliers and relocate production closer to major markets.

For firms in developing and emerging economies, the strategic question is not simply "how to join" a GVC, but how to move from low-margin, easily replaceable tasks into higher value-added positions. This movement is widely conceptualized as "upgrading." However, upgrading is not automatic: it depends on capabilities, governance, and the distribution of rents along the chain. The governance typology developed by Gereffi, Humphrey, and Sturgeon explains how lead firms set parameters (product specifications, quality standards, delivery

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schedules), shaping suppliers' opportunities to learn, invest, and move into higher-value functions. Complementing this, operational GVC toolkits emphasize that upgrading involves both firm-level improvements and institutional conditions that support learning and linkages.

Conceptual approach and sources

This paper is a conceptual synthesis grounded in established GVC theory and value-added trade measurement. It draws on: the GVC governance framework (Gereffi et al., 2005); World Bank analytical guidance on joining and upgrading in GVCs; OECD TiVA concepts and indicators for tracing domestic value added embodied in exports; and empirical evidence that GVC integration can raise domestic value added, including cross-country findings on "selling-side" gains. The goal is to translate these foundations into a practical "strategy → governance → capability → performance" logic.

Upgrading strategies in GVCs

A standard classification identifies four principal upgrading paths: process, product, functional, and chain upgrading. While often presented as a ladder, these paths are not strictly sequential; firms may pursue multiple upgrades simultaneously or be constrained to certain forms depending on governance and capability.

Process upgrading improves efficiency and reliability-reducing defects, lead times, and unit costs through lean production, automation, quality management, and better logistics. In GVC terms, process upgrading often helps suppliers meet stricter delivery and quality requirements imposed by lead firms. Under captive or modular governance, this may be encouraged by buyers because it lowers supply

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risk. The competitive advantage gained is typically cost-based (or delivery-based), but the margin capture may remain limited if price pressure persists and suppliers lack bargaining power.

Product upgrading moves into more sophisticated products with higher unit value-better materials, enhanced features, improved design-for-manufacturability, or compliance with stringent standards. Product upgrading is frequently tied to certification (ISO, HACCP, IATF 16949, etc.) and deeper engineering capabilities. Unlike process upgrading, product upgrading can raise margins if the supplier owns product-related knowledge and can signal quality to multiple buyers.

Functional upgrading shifts into higher value-added functions such as design, R&D, branding, marketing, distribution, after-sales service, or systems integration. This is often the most profitable form of upgrading because it targets the chain segments where rents accumulate. However, it is also the most politically and contractually constrained: lead firms may resist suppliers moving into branding or direct distribution that threatens their control. Governance matters heavily here: relational governance may enable learning-by-interaction, while captive governance can keep suppliers locked into narrow roles.

Chain upgrading involves moving into new, related value chains that offer higher value capture-e.g., from low-tech assembly into more complex electronics subsystems, or from commodity processing into branded consumer goods. Chain upgrading often requires capability recombination and ecosystem support (skills, standards infrastructure, finance). It can be a strategic “escape” from low-rent segments.

Governance as the constraint and enabler of upgrading

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GVC governance explains why similar upgrading efforts yield different results across contexts. Gereffi et al. (2005) propose governance types shaped by complexity of transactions, ability to codify information, and supplier capabilities.

In captive chains, suppliers rely heavily on lead firms; upgrading can occur in processes and compliance but functional upgrading is often restricted.

In modular chains, codified specifications allow capable suppliers to serve multiple buyers; this improves learning opportunities and bargaining power.

In relational chains, knowledge transfer can be rich but relationship-specific; upgrading depends on trust and long-term collaboration.

In hierarchical chains, internalized control reduces supplier autonomy.

A central implication is that "upgrading strategy must match governance reality." For example, a supplier pursuing functional upgrading in a captive chain may face structural resistance, whereas the same strategy may be feasible in modular contexts where suppliers can diversify customers and develop proprietary capabilities.

Export growth is an incomplete indicator of upgrading because gross exports can rise even when a firm remains locked into low-value, easily substitutable tasks. In many GVC settings, higher shipment volumes may reflect expanded assembly or processing capacity while most value is still created upstream (key components, technology) or downstream (branding, distribution, after-sales). For that reason, the first performance lens should shift from "how much is exported" to "how much value is captured domestically and by the firm." A practical way to do this is to track the domestic value added embodied in exports. Conceptually, if gross exports are (X) and imported intermediate inputs embodied in those exports are (M), then

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domestic value added in exports is approximately (DVA = X - M), and the domestic share is (DVA/X). When upgrading is genuine, the expected pattern is not only higher (X), but a rising (DVA/X) (more local content, more local capability, higher-value tasks performed locally).

A second measurement block focuses on productivity and operational performance, because process and product upgrading should translate into measurable efficiency and reliability gains. Core metrics include unit labor cost, yield and scrap rates, defect rates (PPM), on-time-in-full delivery, order lead time, and energy/material intensity per unit. These indicators matter because lead firms increasingly manage suppliers via scorecards; upgrading that does not improve these metrics rarely sustains market access. However, productivity improvements alone can still produce “thin upgrading” if buyers capture most of the gains through price pressure. Therefore, a third measurement block must explicitly track value capture through margins and bargaining power. Useful indicators include gross margin and contribution margin by product line, price realization versus benchmarks, share of revenue under long-term contracts, customer concentration (e.g., HHI based on buyer shares), and the ability to pass through input-cost shocks (indexation clauses, renegotiation outcomes). If upgrading is successful, unit margins and resilience of margins should improve, not only volumes.

A fourth block measures functional capability deepening, especially when firms aim for functional upgrading. Here, outcomes include the share of revenue from engineering/design services, number of proprietary SKUs, IP or unique process/tooling ownership, brand equity proxies (repeat purchase rates, direct-to-consumer share), and the share of sales generated through direct market access

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rather than intermediated channels. Finally, given ongoing GVC restructuring, resilience and diversification should be treated as upgrading outcomes rather than side effects. Track market diversification (export destinations concentration), supplier diversification (multi-sourcing ratio for critical inputs), inventory coverage for critical components, and recovery time after disruptions. In sum, "upgrading success" is best evidenced by a coherent package: rising domestic value added and margins, improving quality and delivery performance, expanding higher-value functions, and stronger resilience-rather than export growth alone.

Upgrading-to-performance can be expressed as a simple, actionable logic chain: the firm first chooses an upgrading path (process, product, functional, or chain), then invests in the specific capabilities that path requires (skills, technology, standards compliance, digital systems, supplier development). Those capabilities determine the firm's feasible position within the GVC governance structure-whether it remains captive to a single lead buyer or can operate more modularly across multiple customers. Governance position, in turn, shapes bargaining power and learning intensity, which largely determine value capture (domestic value added in exports, margins, and ownership of critical functions such as design or market access). When these elements align, performance outcomes improve in measurable ways: higher domestic value-added share, better productivity and delivery reliability, stronger margins, broader market diversification, and greater resilience to shocks.

In practice, what works most consistently for managers is combining "must-have" process improvements with selective moves that increase differentiation and reduce dependency. That means building reliable quality and delivery first, then

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upgrading products and compliance to meet tougher specifications, and diversifying customers to escape price pressure. Firms improve value capture when they codify and protect know-how (process documentation, proprietary tooling, traceability data), invest in certifications and testing capacity, and design contracts that share risk (indexation, long-term agreements, clear service levels). Functional upgrading succeeds more often when it is gradual-starting with engineering support, customization, or after-sales services-rather than jumping directly into activities that threaten lead-firm control.

On the policy side, the most effective interventions are those that lower the "capability cost" of upgrading. This includes strengthening skills pipelines (technical and engineering training), expanding standards infrastructure (labs, certification bodies), improving logistics and trade facilitation, and running supplier-development programs that connect local firms to lead buyers with structured upgrading milestones. Importantly, performance evaluation should not rely on export volumes alone; policies should be judged by value-added outcomes (higher domestic value-added share, productivity, and diversification) and by whether firms move into more complex tasks that generate durable competitiveness.

Conclusion

Competitive advantage in GVCs is not determined by participation alone but by the ability to upgrade into higher value-added tasks under specific governance conditions. Process and product upgrading can improve efficiency and quality, but functional and chain upgrading are more directly linked to durable rent capture-though they face stronger governance constraints. The most credible evidence-

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based way to assess upgrading success is to move beyond gross exports and track domestic value added, productivity, margins, functional capability, and resilience-especially as value chains restructure under geopolitical and technological pressures. OECD TiVA concepts provide a practical measurement lens for distinguishing “export growth” from “value capture”.

For firms, the core strategic lesson is to align upgrading ambitions with governance realities, invest in capabilities that increase customer diversification and differentiation, and target functions where knowledge and market access can be owned rather than rented. For policymakers, the lesson is to support upgrading through skills, standards, logistics, and innovation systems, and to evaluate success through value-added outcomes.

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