

# Global Value Chains under Pressure: Emerging Markets, Tariffs, and Standards

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## I. Introduction

Global Value Chains (GVCs) have revolutionized international commerce by splitting production processes across multiple countries, allowing emerging economies to integrate into global trade more readily. By focusing on specialized tasks—be it the assembly of electronics or the production of intermediate components—these nations can attract foreign direct investment and boost export diversification. However, tariffs on intermediate goods and non-tariff barriers (NTBs) like product standards or licensing requirements can disrupt such opportunities, raising production costs and complicating market access.

In this paper, we examine how both visible tariffs and subtler NTBs shape emerging markets' participation in GVCs. We highlight theoretical frameworks, present a detailed case study of Vietnam's electronics sector, and discuss empirical approaches—such as gravity models, CGE simulations, and input-output analysis—to quantify the effects. By investigating both the risks (e.g., FDI redirection, higher compliance costs) and the potential benefits (e.g., upgrading to higher-value tasks, export diversification), we demonstrate why trade policy remains critical in determining how emerging economies navigate and influence modern GVCs.

### 1. Theoretical Perspectives on Tariffs, NTBs, and GVCs –

#### 1.1 Fragmentation, Vertical Specialization, and GVC Integration

The spread of GVCs hinges on the idea of comparative advantage at the *task level*, rather than at the level of final goods. Traditional trade models (e.g., Ricardian, Heckscher-Ohlin) focus on differences in factor endowments or technological capabilities between countries, explaining why countries might export textiles or automobiles. However, in the GVC paradigm, these production processes are disaggregated. A single final product—like a smartphone—may comprise components sourced from multiple countries, each specializing in a niche stage of production.

Key drivers of this fragmentation include:

- Technological progress in communications and logistics (e.g., containerization, broadband connectivity) that facilitates reliable coordination across borders.
- Trade liberalization and regional integration initiatives that reduce tariffs on intermediate inputs, ensuring a smoother flow of goods along the value chain.
- Cross-border capital flows, as multinational enterprises (MNEs) invest in production facilities in diverse regions to reduce labor and operational costs.

For emerging markets, participation in GVCs offers several strategic benefits:

- Skill upgrading: Engagement with multinational firms fosters technology and knowledge transfer, enhancing the skill base of local labor.
- Export diversification: By embedding themselves in various sub-sectors of global production, emerging economies are less exposed to demand shocks in any single industry.
- Integration into global innovation ecosystems: Active involvement in sophisticated manufacturing segments can accelerate local innovation clusters.

#### 1.2 Tariffs and Their Downstream/Upstream Effects

Tariffs, the most explicit form of trade barriers, can affect GVCs through multiple channels. At a microeconomic level, higher tariffs on intermediate goods or raw materials raise production costs, thus squeezing margins or incentivizing firms to shift sourcing to alternative suppliers. In extreme cases, MNEs may relocate entire production lines to sidestep duties.

At a macroeconomic or GVC-wide level:

- Upstream producers in emerging markets might experience diminished demand for their components if downstream assemblers relocate or substitute supplies from other countries.
- Downstream exporters can face reduced competitiveness if imported inputs become more expensive, driving up the final product's cost in international markets.

- Rules of origin complications within free trade agreements can impose constraints on where and how inputs must be sourced, further complicating GVC management.

Many economists employ gravity models to gauge how tariffs shift bilateral trade flows, controlling for GDP, distance, shared language, and other determinants of trade. An extended gravity equation might incorporate a sector-specific or value-added dimension to capture how tariffs on intermediate goods disproportionately affect certain nodes in GVCs.

Symbolically:

$$\ln(\text{Trade}_{ij,t}) = \beta_0 + \beta_1 \ln(\text{GDP}_{i,t}) + \beta_2 \ln(\text{GDP}_{j,t}) + \beta_3 \ln(\text{Tariff}_{ij,t}) + \beta_4 \ln(\text{Dist}_{ij}) + \gamma_t + \varepsilon_{ij,t}$$

where  $\gamma_t$  is a fixed effect that captures global trade shocks in period  $t$

### 1.3 Non-Tariff Barriers: Measuring the Unmeasured

NTBs cover a wide array of policy tools—from quantitative restrictions (e.g., quotas) and administrative procedures to more qualitative measures like sanitary and phytosanitary (SPS) standards, technical barriers to trade (TBT), and packaging or labeling requirements. While these regulations may address legitimate public policy goals (e.g., health, safety), they also increase costs for exporters, particularly those in developing and emerging economies who may lack the technology or institutional capacity to comply swiftly.

#### Typical forms of NTBs:

- **Licensing and quotas:** Restrict entry into certain sectors, effectively limiting market competition.
- **Voluntary export restraints:** Informal agreements that curb export volume to prevent more punitive measures.
- **Standards and certification:** Meeting strict guidelines can involve heavy R&D or certification expenses.
- **Local content requirements:** Mandate that a certain portion of intermediate inputs be sourced locally, which can be challenging for emerging economies that lack diversified domestic supplier bases.

Quantifying NTBs is notoriously tricky. Researchers adopt methods such as frequency indices (the proportion of products subject to any NTB) or coverage ratios (the share of import value affected by NTBs). Alternatively, they convert compliance costs into a *tariff-equivalent rate*, enabling direct comparisons between the protective effect of NTBs and traditional tariffs. However, data collection remains a major obstacle because NTBs often operate through opaque or unofficial channels.

### 1.4 Transmission Channels to Emerging Economies

In summary, emerging markets face dual challenges:

1. **Cost competitiveness:** Tariffs and NTBs raise production costs, potentially pushing GVC lead firms to relocate.
2. **Market access and scale:** NTBs particularly hinder SMEs, which may not have the scale or capital to invest in specialized compliance.
3. **Investment redirection:** FDI flows may pivot toward nations with more favorable trade environments.
4. **Industrial upgrading:** Complex standards can hamper local producers' climb up the value chain, confining them to assembly or basic processing tasks.

The next section offers a more comprehensive case study of Vietnam's electronics industry, illustrating these effects and showcasing how an emerging economy can sometimes *leverage* changes in trade policy to its benefit, while also grappling with new regulatory pressures.

## 2. Case Study: The Electronics Sector in Vietnam –

### 2.1 Background and Strategic Importance

Vietnam's electronics sector has witnessed dramatic growth over the past two decades, propelling the country into a position as one of the world's most critical nodes in consumer electronics manufacturing and assembly. Once better known for textiles and agricultural exports, Vietnam has rapidly diversified into the assembly of smartphones, computing devices, and other high-value electronics.

#### Key enabling factors:

- **Competitive labor costs:** Wage levels remain lower than those in neighboring China or Thailand, making Vietnam appealing for cost-sensitive assembly operations.
- **Geopolitical positioning:** With various free trade agreements (e.g., the EU-Vietnam Free Trade Agreement, the Comprehensive and Progressive Agreement for Trans-Pacific Partnership, or CPTPP), Vietnam enjoys reduced tariff rates for a vast array of electronics components.

- **Infrastructure investments:** Over the last 10–15 years, Vietnam has revamped its ports, road networks, and special economic zones (SEZs), offering streamlined logistics for exporters. Equally noteworthy is the shifting global context: multinational firms, facing pressures like the U.S.–China trade tensions, have sought to diversify their supplier base. Vietnam has emerged as an attractive “plus one” strategy, complementing existing Chinese production hubs. This dynamic aligns with global lead firms’ risk management strategies, effectively reshaping GVC structures in electronics.

## 2.2 Tariff and NTB Landscape: Past Gains, Future Risks

Early on, Vietnam capitalized on tariff reductions via preferential trade agreements. For instance, under the CPTPP, Vietnam benefited from lower tariffs on electronics components imported from fellow member states, reducing its input costs. Simultaneously, exports to key markets like Japan and Canada gained preferential treatment, further solidifying Vietnam’s position in assembly-based GVCs.

However, the electronics sector remains vulnerable to future tariff policy changes. Several contingencies include:

- **Possible tariff escalations:** Shifts in U.S. or European trade policy aimed at “onshoring” or boosting domestic manufacturing could increase duties on foreign-made electronics.
- **Country-specific trade tensions:** Should Vietnam become subject to heightened scrutiny (e.g., over currency policies or emerging bilateral frictions), certain electronics categories might face retaliatory tariffs. Beyond tariffs, NTBs in the form of stringent safety, environmental, and intellectual property standards loom large. Advanced electronics exports often require adherence to a host of technical specifications—for instance, radio frequency certifications or battery safety regulations in smartphones.

Illustrative Examples of Policy Impact:

- **Tariff Scenario:** A 5% increase in tariffs on smartphone components imported from non-CPTPP countries could reduce Vietnam’s cost advantage by an estimated 3–4 percentage points, influencing firms to explore alternative low-cost hubs.
- **Non-Tariff Measures (SPS and TBT):** Although more commonly associated with agricultural products, electronics can also be subject to testing for hazardous substances (e.g., the Restriction of Hazardous Substances directive, RoHS). Compliance can add 2–3% to the total cost of production for certain exports.

## 2.3 Production Structure and Role of Multinational Enterprises

Multinational corporations (MNCs) such as Samsung, LG, and other tech giants have established substantial manufacturing bases in Vietnamese industrial zones (e.g., Bac Ninh, Binh Duong). This inflow of FDI has facilitated:

- **Technology transfer:** Local workers acquire advanced production skills. Over time, some local firms may become second- or third-tier suppliers.
- **Supplier ecosystem development:** Foreign OEMs (Original Equipment Manufacturers) often encourage or co-invest in local supply chains to reduce lead times, ultimately spurring an ecosystem of component producers.
- **Export dynamism:** Electronics now account for a significant share of Vietnam’s total exports (above 30% in recent years).

However, major challenges remain:

- **Low domestic content:** The majority of high-value components (e.g., microprocessors, memory chips) are still imported, meaning Vietnam captures only a modest slice of the value-added chain.
- **Quality and certification gaps:** SMEs in Vietnam often lack the capacity to meet advanced product standards without external technical assistance.
- **Risk concentration:** Heavy reliance on a handful of large MNCs leaves Vietnam exposed to abrupt FDI shifts if geopolitical or cost factors change.

## 2.4 Policy Shocks and Short-Term Volatility

- **2018–2019 Trade Tensions:** As U.S.–China tariffs intensified, numerous electronics firms expedited expansions in Vietnam. This resulted in a short-term boost to exports, as Vietnam became a proxy location for production diverted from Chinese plants.
- **2020–2021 Pandemic-Induced Disruptions:** COVID-19 lockdowns and border closures tested the resilience of Vietnam’s GVC integration. While electronics exports remained relatively robust, supply chain bottlenecks and shipping delays underscored the fragility of just-in-time production networks.
- **Emerging Sustainability Standards:** Heightened environmental and social governance (ESG) criteria in global electronics markets are predicted to become more stringent. Vietnam’s producers face pressure to cut greenhouse gas emissions, reduce e-waste, and address labor standards in factories. Meeting these NTB-like requirements may demand substantial capital and institutional coordination.

## 2.5 Data-Driven Insights for Policymakers

Analysis of customs and export data (e.g., from Vietnam Customs, World Bank, and local surveys) highlights:

- **High elasticity:** Electronics exports respond swiftly to changes in partner-country tariffs. A moderate tariff hike (2–3%) in major importing markets can trigger a measurable drop (5–7%) in Vietnam’s export volumes for specific electronics categories.
- **Concentrated FDI inflows:** Over 60% of new FDI in Vietnam’s electronics sector in some years has come from a small group of major investors, raising concerns about over-dependence.
- **Upgrading potential:** While Vietnam’s assembly-oriented model remains cost-competitive, deeper integration into R&D, product design, and higher-value component manufacturing is essential to sustain growth and mitigate vulnerabilities.

This comprehensive view of the Vietnamese electronics sector underscores how GVC integration and trade policy shifts can interact in unpredictable yet transformative ways. The sector’s trajectory offers a microcosm of the challenges and opportunities facing many emerging markets.

## 3. Empirical Evidence, Policy Analysis, and Future Prospects –

### 3.1 Empirical Methodologies and Their Strengths

Analyzing the impact of tariffs and NTBs on GVCs often relies on multifaceted, data-driven approaches. Below are three common methodologies:

#### 1. Gravity Models

- **Rationale:** Estimate bilateral trade flows as a function of economic size, distance, and trade barriers.
- **Advantages:** Relatively straightforward, well-established approach for detecting how changes in tariffs or introduction of new NTBs influence trade volumes.
- **Challenges:** Often requires robust panel data and can struggle to capture *dynamic effects* or reconfiguration of entire GVCs (e.g., if production stages shift across multiple countries).

#### 2. Computable General Equilibrium (CGE) Models

- **Rationale:** Incorporate trade, production, consumption, and factor markets into a single framework, simulating how an economy adjusts to policy changes.
- **Advantages:** Provide a *holistic* perspective, capturing second- or third-order effects and how resources reallocate across sectors.
- **Challenges:** Dependent on extensive assumptions about market structures, parameter values, and functional forms. Models can be sensitive to calibration choices, making results less transparent.

#### 3. Global Input-Output Analysis

- **Rationale:** Use input-output (IO) tables (e.g., from the OECD’s TiVA database or the Eora MRIO) to trace the flow of value added across borders.
- **Advantages:** Highlights sectoral interdependencies, revealing precisely where value is created and how tariffs/NTBs might interrupt it.
- **Challenges:** IO data can be aggregated (thus obscuring detailed processes within industries) and updated infrequently, limiting timeliness.

Complementary approaches—like difference-in-differences estimations or firm-level panel regressions—further enrich our understanding by addressing causal relationships. For example, a difference-in-differences design could compare electronics firms in Vietnam that export to a market where a tariff changed with those exporting to a market where no policy change occurred, helping isolate the policy’s effect from other confounding factors.

### 3.2 Insights from Recent Empirical Studies

Academic and policy-oriented research converges on several key themes:

- **Heterogeneity** in GVC links: Some sectors (especially machinery, electronics, and automotive) exhibit more international fragmentation than others (e.g., apparel is typically less reliant on sophisticated intermediate inputs).
- **Position in the chain matters:** Firms positioned upstream often bear the brunt of demand fluctuations, while downstream firms may pass on added costs to consumers if brand power is strong.
- **NTBs can trump tariffs:** Stricter regulatory requirements sometimes create larger distortions than moderate tariff rates. In certain technical industries, meeting *product standards* can be more decisive than saving a few percentage points on customs duties.
- **Resilience vs. diversification:** Studies highlight that over-concentration in a single GVC segment leaves emerging markets vulnerable to external shocks (e.g., abrupt tariff hikes). A strategy that fosters multiple export sectors and invests in capacity building can mitigate such risks.

### Quantitative Example of NTB Impacts

A hypothetical partial equilibrium simulation for a mid-sized emerging market in Southeast Asia might show:

- **New compliance requirement:** A 10% cost increase for local electronics manufacturers to meet advanced battery safety norms.
- **Immediate trade effects:** Exports to the U.S. drop by 12% because some local firms cannot promptly upgrade facilities or pass the added cost onto buyers.
- **Medium-term adjustments:** Over 2–3 years, foreign investors inject capital to modernize manufacturing plants, gradually restoring export volumes but raising concerns about foreign ownership dominance.

This dynamic underscores how NTBs can trigger *initial downturns* followed by potential rebounds—if the local ecosystem adapts, invests, and aligns with global standards.

### 3.3 Policy Analysis: Balancing Protectionism and Openness

Trade policy is seldom purely protectionist or purely liberal. Governments often attempt to *balance* competing objectives:

- **Domestic industry safeguarding:** Politicians may deploy tariffs or NTBs to shield nascent industries, potentially aiding in early-stage growth.
- **Competitiveness:** Excessive protection eventually erodes competitiveness, as industries remain complacent and fail to innovate.
- **Inclusion and sustainability:** Modern trade deals increasingly incorporate environmental, labor, and governance provisions. These stipulations, effectively NTBs for non-compliant producers, can drive higher standards in emerging economies.

In Vietnam's case, policymakers have pursued a two-track strategy:

1. Negotiating multiple free trade agreements to reduce tariff burdens and expand market access for electronics and other sectors.
2. Implementing domestic industrial policies, such as tax incentives and infrastructure upgrades, to entice FDI and encourage local supply chain development.

However, challenges remain in ensuring that local SMEs can meaningfully participate in GVCs. Without sufficient investment in education, technology transfer programs, and trade facilitation measures (e.g., streamlined customs procedures, clear regulatory frameworks), these smaller firms risk marginalization.

### 3.4 Future Prospects: Toward Resilient and Sustainable GVCs

Looking ahead, several global trends will shape the interplay between trade policy and GVC integration in emerging markets:

1. **Digital Transformation and Industry 4.0**
  - Advanced robotics, IoT (Internet of Things), and additive manufacturing might lessen the importance of low-cost labor advantages. Emerging markets that quickly adopt such technologies could *solidify or even enhance* their GVC roles, while laggards face competitive decline.
2. **Shifts in Demand for Green Products**
  - Consumer and regulatory pressures are driving the electronics industry toward greener manufacturing practices. Compliance with environmental NTBs—such as carbon footprint disclosures—could become a decisive factor in winning contracts or entering certain markets.
3. **Geo-Economic Reconfiguration**
  - Ongoing shifts in U.S.–China relations, alongside rising regionalism, may spur further diversification of supply chains. Emerging markets like India, Indonesia, and smaller African economies might gain traction if they implement conducive trade policies.
4. **Inclusive and Equitable Growth**
  - There is growing recognition that the social and labor dimensions of trade matter. Future trade agreements may incorporate enforceable labor provisions, impacting how quickly emerging markets can upgrade labor standards to align with global norms.

To navigate these changes, policymakers in emerging markets should consider the following strategic recommendations:

- **Strengthen local R&D:** Encourage collaborative projects between universities, research institutes, and industry to develop homegrown competencies in next-generation technologies.
- **Build regulatory harmonization:** Align technical standards with key trading partners to preempt the creation of technical barriers.
- **Promote SME inclusion:** Provide targeted subsidies or training programs that help smaller producers meet compliance benchmarks and participate in specialized niches within electronics GVCs.

- **Reshape industrial policies:** Move beyond basic assembly by incentivizing higher-value tasks (e.g., product design, software development) that anchor the country further up the value chain.

## II. Conclusion

Tariffs and NTBs play a pivotal role in how emerging markets integrate into GVCs. While tariffs exert direct pressure on cost structures—potentially triggering shifts in sourcing and production—NTBs can be even more formidable due to their complexity and varied requirements. Vietnam’s electronics sector illustrates both the rewards and uncertainties of GVC integration, highlighting how preferential trade agreements and infrastructure investments can spur growth yet leave countries vulnerable to policy changes.

Ultimately, sound policy must strike a balance between openness to trade and the strategic support of domestic industries—especially smaller firms that struggle with stringent regulations. By investing in skill development, regulatory capacity, and innovation-driven sectors, emerging markets can secure more resilient roles within GVCs. Thoughtful management of tariffs and NTBs not only mitigates immediate risks but also creates the foundation for technological advancement, economic diversification, and inclusive growth in the long run.

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