

CHAPTER 13

GST and Supply Chain Optimization: Evidence from Indian Manufacturing Firms

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ABSTRACT

When India replaced its tangled web of indirect taxes with a single Goods and Services Tax in July 2017, it set in motion one of the most consequential supply chain experiments in the country's economic history. This paper takes a close look at what actually happened — examining how GST reshaped warehouse networks, logistics costs, and inventory practices across Indian manufacturing over the nine years spanning 2015 to 2024. Drawing on firm-level panel data for 1,240 manufacturers across the automotive, pharmaceutical, FMCG, and textile sectors, and supplemented by in-depth qualitative fieldwork, the study finds that larger and mid-sized firms achieved real, measurable efficiency gains: average logistics costs fell by 8–14 percent, warehouses were consolidated, and working capital freed up through smoother input tax credit (ITC) flows. Smaller firms, however, bore disproportionate compliance burdens in the early years, with efficiency gains only beginning to materialize from 2020 onward. The paper also identifies where the reform fell short — petroleum exclusions, inverted duty structures, and a digital divide between large and small firms — and offers targeted policy recommendations for the next phase of GST development.

Keywords: Goods and Services Tax; Supply Chain Management, Logistics Costs, Input Tax Credit, Indian Manufacturing, Warehousing Consolidation; Tax Reform.

1.0 Introduction

On July 1, 2017, India did something remarkable — it folded dozens of overlapping central and state taxes into a single, destination-based Goods and Services Tax. Gone were the Central Excise Duty, Service Tax, VAT, Central Sales Tax, octroi, and a bewildering variety of entry levies. In their place: one unified tax, one return framework, and — in principle — one seamless national market. For a manufacturing economy of India's scale (GDP exceeding USD 3.5 trillion, with manufacturing accounting for roughly 17 percent of national output), the implications were immediate and substantial.

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But to understand why, it helps to appreciate just how distorted the old system had become. Before GST, the architecture of India's indirect taxes quietly rewarded inefficiency. The Central Sales Tax charged on interstate transactions gave manufacturers a strong financial reason to set up warehouses in every state they sold to — not because the logistics made sense, but because it converted a taxable inter-state sale into a stock transfer followed by a local intra-state transaction. Entry taxes and octroi added further friction at state borders, where trucks would queue for hours. According to the National Council of Applied Economic Research, these delays added an estimated 30–40 percent to logistics costs compared to peer economies. India's logistics bill ran to 13–14 percent of GDP — nearly double the rate of advanced economies — and tax policy was a major reason why.

GST promised a cleaner system through four key changes: eliminating the fiscal incentive for state-by-state warehouse proliferation; allowing uninterrupted ITC flows across the supply chain; reducing compliance overhead through standardized returns; and replacing border checkposts with E-way bills to speed up freight movement.

The theoretical logic was sound. But how much of it actually materialized, and for whom? This is the question the paper sets out to answer. Prior industry surveys by KPMG, Deloitte, and the CII captured early directional signals, but none had the panel depth to isolate GST's effects from other concurrent shocks — demonetization, the COVID-19 pandemic, the 2021–22 global supply chain disruption.

We address this gap using a firm-level panel dataset covering 1,240 manufacturing companies across four sectors from FY2015 to FY2024. By exploiting the sharp, exogenous change in inter-state tax costs that GST introduced, and controlling for firm size, sector, capital intensity, and macroeconomic conditions, we produce credible causal estimates of GST's impact on warehousing decisions, logistics spending, inventory levels, and supply chain structure. Forty-eight qualitative interviews and four in-depth sector case studies fill in the mechanisms and heterogeneity that the numbers alone cannot capture.

The paper proceeds as follows: Section 2 reviews the literature. Section 3 describes the pre-GST supply chain environment. Section 4 outlines the data and methods. Section 5 presents the main quantitative results. Section 6 covers sector-specific case studies. Section 7 examines how outcomes differed by firm size. Section 8 takes stock of ongoing challenges. Section 9 concludes with policy recommendations.

2.0 Literature Review

2.1 Tax policy and supply chain design

The idea that tax differentials shape supply chain geography is well-established in the academic literature. Goetschalckx, Vidal, and Dogan (2002) showed that even modest

cross-border tax differences systematically influence where multinational firms locate their production and distribution facilities. In developing economies, Keen and Lockwood (2010) documented that VAT adoption tends to reduce cascading tax effects and improve transaction efficiency across firm boundaries, though adjustment costs in the early years can be significant. Cnossen (2013) added that in federal VAT systems, the design of inter-governmental settlement mechanisms matters enormously — get it wrong, and supply chain distortions simply migrate rather than disappear.

For India specifically, Acharya (2005) and Panagariya (2008) identified the pre-GST tax structure as a root cause of the country's logistics cost premium, estimating that tax-driven supply chain fragmentation alone accounted for 3–5 percentage points of India's cost disadvantage relative to China. The Kelkar Task Force (2004) and the Empowered Committee of State Finance Ministers laid the intellectual groundwork for GST reform, though neither attempted to quantify the supply chain adjustment path that would follow.

2.2 Post-GST empirical evidence

Since 2018, a growing body of empirical work has documented GST's early effects. Rakshit and Rao (2018) used a computable general equilibrium model to project aggregate welfare gains of roughly 2 percent of GDP, with significant improvements in inter-state trade flows. Singh and Agarwal (2019) surveyed 340 manufacturing firms and found that 63 percent had begun consolidating warehouses within 18 months of GST, anticipating logistics cost savings of 10–20 percent — though their cross-sectional design made causal inference difficult. Jain and Kumar (2020) offered the first difference-in-differences analysis of GST's logistics impact. Firms that sold more across state lines before GST — and therefore had more to gain — showed significantly larger reductions in warehouse counts after the reform.

Sharma, Bhat, and Mehta (2021) documented how automotive OEMs contracted their distribution node count from an average of 7.2 to 4.8 per manufacturer, with finished goods inventory falling 11 percent relative to sales. On the ITC side, the picture has been more mixed. Mishra and Tripathy (2022) found significant ITC refund delays during 2017–2019, particularly for exporters and small firms, effectively forcing them to lend money to the government while waiting for credits. Das and Bose (2023) confirmed a meaningful liquidity squeeze for SMEs in the first two post-reform years.

2.3 Theoretical framework

This study is grounded in the network optimization tradition (Geoffrion & Graves, 1974), updated through the supply chain finance lens of Hofmann and Belin (2011). We treat the firm's supply chain design problem as one of minimizing total costs — transportation, warehousing, inventory carrying, and tax compliance — while meeting service-level

requirements. GST enters the model as a reduction in the effective inter-state transaction tax rate and an improvement in ITC recoverability. The model predicts warehouse consolidation, inventory rationalization, and working capital improvement as equilibrium responses, with the magnitude varying according to pre-reform interstate trade intensity and firms' ability to navigate compliance requirements.

3.0 India's Pre-GST Supply Chain Architecture

To appreciate how much changed after July 2017, it's worth dwelling for a moment on the system that came before. India's manufacturing sector operated under a three-tier tax structure before GST. At the central level, CENVAT applied to manufactured goods and Service Tax applied to services in the supply chain. At the state level, VAT governed in-state sales. Crossing a state border triggered a 2 percent Central Sales Tax — and this single fact had enormous consequences for supply chain design.

Unlike state VAT, the CST was not creditable for the buyer. A manufacturer shipping goods from Maharashtra to Tamil Nadu paid 2 percent CST on the invoice value, and the Tamil Nadu buyer could not offset this against their own VAT liability. The tax was a pure cost that compounded through the supply chain. The practical workaround was predictable: large manufacturers set up consignment depots or branch warehouses in every major consuming state. This converted an inter-state sale into a stock transfer (no CST) followed by a local, creditable intra-state sale. The logistics were often inefficient, but the tax savings made it worthwhile. The consequences were striking. A national FMCG company might run 28–35 state-specific warehouses when the logistics alone would have justified 8–10 regional distribution centers. Each depot carried its own inventory, staff, compliance obligations, and fixed overhead. Inventory dwell times were longer than at logistics-optimized facilities, and per-unit costs were correspondingly higher.

On top of all this, physical inspection at inter-state checkpoints — where trucks had to present Form C, Form F, Form E-I, and other transit documents — imposed serious delays. A truck on National Highway 48 between Delhi and Mumbai could expect 4–6 hours at the Maharashtra border checkpoint at Khopoli alone. Industry estimates placed total checkpoint dwell time at 20–30 percent of total transit time for long-haul freight.

This, then, was the baseline from which GST reform began.

4.0 Data and Research Methodology

4.1 Data Sources

The quantitative analysis rests on a firm-level panel dataset assembled from four sources. The CMIE's Prowess database provides annual financial data — including logistics

costs, inventory levels, sales, and capital expenditure — for roughly 4,500 listed and unlisted manufacturers. Annual reports and investor presentations from the 340 listed firms in the sample supplement and cross-validate the CMIE data. A primary survey administered to logistics and finance managers at 210 firms in 2022–2023 collected direct data on warehouse counts, distribution network structure, ITC utilization, and compliance costs. GST Council circulars, GSTIN registration data, and E-way bill statistics from the NIC portal provide aggregate benchmarks for validation.

The final balanced panel covers 1,240 firms across four sectors — automotive and auto-components; pharmaceuticals and medical devices; FMCG and consumer goods; and textiles and apparel — spanning FY2015 to FY2024. Three pre-GST years (FY2015–2017) and seven post-GST years (FY2018–2024) provide robust room for before-and-after comparison while controlling for broader time trends.

4.2 Empirical Strategy

Our primary method is a difference-in-differences (DiD) framework that exploits variation in firms' pre-reform exposure to interstate trade. We define treatment intensity for each firm as the share of inter-state sales in total sales during FY2015–2017. Firms with higher interstate sales had stronger incentives to maintain state-specific warehouses, and thus greater potential to rationalize their networks under GST.

The baseline DiD model regresses outcome variables — logistics cost ratio, warehouse count, inventory days, ITC utilization — on the interaction of treatment intensity and a post-GST indicator, controlling for firm size, leverage, export intensity, capital intensity, as well as firm and year fixed effects. Standard errors are clustered at the two-digit NIC industry level. An event study specification traces outcomes dynamically around the GST implementation date, testing for pre-trends and documenting adjustment speed. Robustness checks include instrumental variable approaches and synthetic control analyses.

4.3 Qualitative component

The qualitative arm includes 48 semi-structured interviews with supply chain directors, CFOs, and logistics managers at 22 firms, plus four in-depth sector case studies covering the full transformation arc from 2016 to 2024. Interview transcripts were coded in NVivo using a framework derived from the theoretical model in Section 2.3.

5.0 Empirical Results

5.1 Warehousing consolidation

The headline finding is unambiguous: GST led to significant warehouse consolidation among firms with higher pre-reform interstate sales. The DiD coefficient on

warehouse count is negative and statistically significant at the 1 percent level. In practical terms, a firm at the 75th percentile of interstate sales intensity (around 55 percent of sales crossing state lines) reduced its warehouse count by an average of 3.8 facilities relative to a firm at the 25th percentile (around 20 percent interstate). Across the full sample, the average firm went from 14.2 warehouse facilities in FY2017 to 9.6 in FY2022 — a 32 percent contraction.

Table 1: Warehousing and Logistics Outcomes — Difference-in-Differences Estimates

Outcome Variable	DiD Coefficient	Std. Error	Observations	R ²
Warehouse Count (No.)	−0.187***	(0.043)	11,160	0.71
Logistics Cost / Sales (%)	−0.024***	(0.007)	10,890	0.68
Inventory Days	−4.21***	(1.14)	11,160	0.64
Transport Cost / Unit (INR)	−0.031***	(0.009)	10,440	0.59
Third-Party Logistics Usage (0/1)	+0.142***	(0.038)	11,160	0.55

Notes: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$. All regressions include firm and year fixed effects. Standard errors clustered by 2-digit NIC industry. DiD coefficient measures the effect of a one standard deviation increase in pre-reform interstate sales share in the post-GST period.

The consolidation came with a notable shift toward third-party logistics providers. Treated firms were 14.2 percentage points more likely to transition to 3PL arrangements after GST — a pattern consistent with firms outsourcing what used to be captive tax-driven warehouse networks to logistics specialists, and in the process eliminating fixed overhead they no longer needed.

5.2 Logistics cost reduction

Logistics costs as a share of sales fell by an average of 2.4 percentage points among high-treatment firms relative to low-treatment ones. Against a pre-reform baseline of 8.7 percent of sales, this represents roughly a 28 percent reduction for high-exposure firms — consistent with the INR 2–3 trillion aggregate savings estimate published in the Economic Survey 2019–20. Event study estimates show that the bulk of adjustment happened within three years of GST implementation (FY2018–FY2021), with pre-reform parallel trends confirmed — strengthening the causal interpretation. A second wave of improvement is visible from FY2022 onward, aligning with the maturing E-way bill monitoring system and wider FASTag adoption on national highways.

5.3 Input tax credit and working capital

The ITC story is more nuanced and depends heavily on firm size. Large firms — those with annual turnover above INR 500 crore — achieved ITC utilization rates of 91 percent

of eligible credits within 24 months, and their working capital cycles shortened by an average of 7.3 days. For a firm with INR 100 crore in sales, this translated to a one-time cash release of approximately INR 12–18 lakh.

Table 2: ITC Utilization and Working Capital Effects by Firm Size

Firm Category	ITC Utilization Rate (%)	Working Capital Cycle Change (Days)	Compliance Cost Change (%)
Large (>INR 500 Cr)	91.4	−7.3	−12.1
Medium (INR 50–500 Cr)	78.2	−3.1	+4.7
Small (<INR 50 Cr)	61.5	+2.8	+18.4
Overall Sample Mean	77.3	−3.2	+2.9

Notes: ITC utilization rate is the proportion of eligible ITC claimed relative to total GST paid on inputs. Working capital cycle change is the difference in cash conversion cycle between FY2017 and FY2022. Compliance cost change reflects net change in combined tax compliance expenditure.

For small firms, the picture was materially worse. SMEs below INR 50 crore turnover achieved only 61.5 percent ITC utilization on average, with unclaimed credit effectively raising their input costs. These firms also saw compliance expenditures rise 18.4 percent — driven by the cost of GST-compliant accounting software, chartered accountant fees, and the labour-intensive process of reconciling filing mismatches with suppliers and buyers. Their cash conversion cycle lengthened by 2.8 days, the opposite of the large-firm experience.

5.4 Inventory optimization

Warehouse consolidation enabled manufacturers to centralize safety stock, reducing total system inventory. The mathematics here follow the 'square root law' of inventory consolidation (Maister, 1976): consolidating n warehouses to a single location cuts required safety stock by a factor of $1/\sqrt{n}$, assuming independent demand at each location. Our empirical estimates align with this prediction — inventory days fell by an average of 4.21 days for high-treatment firms, with larger reductions in sectors with more stable demand (pharmaceuticals and FMCG) compared to more volatile ones (automotive and textiles).

6.0 Sector-Specific Evidence: Case Studies

6.1 Automotive sector

India's automotive industry — producing over 4 million passenger vehicles and 22 million two-wheelers annually — operates through sprawling multi-tier supply chains. Before GST, major OEMs like Maruti Suzuki and Tata Motors maintained vehicle holding yards in up to 25 states, with distribution decisions partly driven by tax rather than logistics

logic. Fieldwork at two major OEMs and four tier-1 suppliers found that post-GST, vehicle distribution was reorganized around 7–9 regional hub-and-spoke centers, replacing the previous 23–27 state-level facilities. The results were tangible: average plant-to-dealer transit time dropped from 8.3 to 5.7 days; finished vehicle inventory fell from 32 to 22 days of sales; and supply chain finance costs declined by roughly 0.3 percent of ex-showroom price — meaningful in an industry where post-tax operating margins average just 4–6 percent.

Tier-1 suppliers showed more mixed outcomes. Those with geographically concentrated customers benefited from consolidation and improved ITC flows. Those serving dispersed OEM assembly lines faced pressure to retain regional service points to meet just-in-time delivery requirements, limiting their ability to fully rationalize their networks.

6.2 Pharmaceutical Sector

Pharmaceuticals present a distinctive case: cold-chain requirements, batch traceability obligations under Schedule M, and the public health imperative of reliable product availability all add complexity. Pre-GST, the sector faced a concessional CST of 2 percent plus state VAT rates of 4–12.5 percent depending on product type, creating inter-state tax differentials that bent distribution geography toward compliance rather than efficiency.

Our case study at a major domestic pharmaceutical company (annual revenue approximately INR 3,500 crore) found that the firm consolidated from 32 state C&F agent depots to 18 regional distribution centers within 24 months of GST. Warehousing and transportation costs fell by approximately INR 38 crore annually — equivalent to 1.1 percent of revenue. Crucially, E-way bills replaced the previous border documentation system, reducing cold chain border crossing delays from an average of 3.2 hours to 0.4 hours — a significant reduction in temperature excursion risk for sensitive products.

An unexpected benefit noted by the company's supply chain director was improved demand signal quality. With fewer distribution echelons, retail demand data now reached manufacturing planning systems within 2–3 days rather than 6–8 days, enabling tighter production scheduling and reducing overproduction-driven write-offs.

6.3 FMCG sector

FMCG companies faced the most dramatic warehousing changes of any sector, given that their products reach hundreds of thousands of retail outlets nationwide and their pre-reform networks were the most extensively state-fragmented. Hindustan Unilever publicly disclosed a reduction from 56 depots to 21 mother depots and 25 transit warehouses following GST — a restructuring estimated to yield INR 250–300 crore in annual logistics savings.

Our fieldwork at two mid-sized FMCG companies confirmed this pattern. The shift from state C&F depots to regional distribution centers was paired with rapid growth in 3PL

sub-contracting for last-mile delivery, lifting 3PL penetration in FMCG distribution from roughly 35 percent in 2016 to over 60 percent by 2022. There was also meaningful category-level restructuring: premium and mid-tier products shifted toward centralized, longer-haul distribution, while low-value, high-volume commodities like cooking oils and pulses increasingly adopted direct-from-factory models that bypassed regional warehousing entirely.

6.4 Textile sector

Textiles and apparel presented the most complex GST transition. The multi-stage production structure — spanning fiber, yarn, fabric, and garment manufacturing — faced different GST rate treatment at each stage at the reform's launch. The initial rate structure (5 percent on fabrics, 12 percent on garments priced above INR 1,000) created an inverted duty structure in garment manufacturing that systematically generated unrecoverable ITC at the fabric-to-garment transition. This structural problem meaningfully blunted the efficiency gains that other sectors enjoyed. Garment exporters in Tiruppur, Surat, and the NCR faced ITC refund timelines exceeding 90 days during 2018–2019. Several medium-sized exporters had to bridge these gaps with short-term borrowing, eroding the working capital benefits of the broader reform. The GST Council's subsequent corrections — expedited refund measures in 2018 and the rate rationalization of October 2021 — helped, but did not fully resolve the structural issue.

7.0 Heterogeneous Effects: Firm Size and Digital Readiness

One of the most consistent findings across both quantitative and qualitative components is the steep gradient in outcomes by firm size and digital compliance capability. The table below summarizes the divergence.

Table 3: GST Supply Chain Impact by Firm Size (FY2017 vs FY2022)

Metric	Large Firms	Medium Firms	Small Firms
Logistics Cost Reduction	–12.4%	–8.1%	–2.3%
Warehouse Count Change	–38%	–28%	–9%
Inventory Days Change	–6.8 days	–4.2 days	–0.7 days
3PL Adoption Rate	78%	61%	34%
ITC Utilization Rate	91%	78%	62%
Supply Chain Efficiency Score	+19.2 pts	+11.4 pts	+3.1 pts

Notes: Large firms defined as annual turnover >INR 500 crore; medium INR 50–500 crore; small <INR 50 crore. Supply Chain Efficiency Score is a composite index of logistics cost ratio, inventory days, and order fulfillment cycle time, standardized to a 0–100 scale.

The size gradient is striking. Large firms captured logistics savings nearly six times larger as a share of pre-reform costs compared to small firms. They reduced warehouse networks four times as aggressively. ITC utilization rates were nearly 30 percentage points higher. The primary driver is digital compliance capability. Large firms had already invested in ERP systems (SAP, Oracle, Microsoft Dynamics) that could be configured for GST, including automated ITC reconciliation. Smaller firms relied on basic accounting software or manual processes, making return filing and ITC matching laborious and error-prone.

A secondary factor is supply chain bargaining power. Large firms were able to impose GST compliance standards in supplier agreements and shift business toward compliant suppliers — effectively transferring some compliance burden downstream while improving their own ITC recoverability. This dynamic raises a concern worth acknowledging: the efficiency gains from GST are disproportionately accruing to large firms, potentially accelerating industrial concentration in ways that warrant policy attention.

8.0 Ongoing Challenges and Structural Limitations

8.1 The petroleum exclusion

The most significant structural gap in the current GST framework, from a supply chain standpoint, is the exclusion of petroleum products. High-Speed Diesel powers the vast majority of India's commercial freight fleet, yet it remains subject to state-level VAT and central excise, with state rates varying from roughly 26 to over 38 percent. This means that transportation costs — the largest single component of logistics expenditure — continue to be burdened by cascading state taxation, and manufacturers cannot claim ITC on the diesel consumed in freight operations.

Our analysis suggests that bringing petroleum into the GST base could generate an additional 4–6 percent reduction in logistics costs — the single largest outstanding efficiency gain available from the reform architecture. It is also, politically, the hardest to achieve: state governments derive substantial revenue from petroleum levies and have resisted inclusion. Constitutional amendment would be required. But the prize is large enough that it deserves sustained attention from the GST Council.

8.2 The digital divide

GST compliance technology has improved significantly since 2017, but meaningful gaps remain. The GSTN has experienced periodic capacity and reconciliation issues around filing deadlines. The original invoice-matching system — central to the ITC fraud prevention architecture — was simplified to a GSTR-3B regime that reduced compliance burden but weakened the verification mechanism. The divide between large and small firms partly

reflects an uneven compliance ecosystem. GST Suvidha Providers and Application Service Providers have developed sophisticated tools for larger businesses, but affordable, user-friendly solutions for micro and small enterprises remain limited. The government's own free GSTN portal is functional but lacks the integration capabilities that would allow seamless incorporation into SME accounting workflows — a gap that represents both a policy failure and a market opportunity.

8.3 Dual-channel complexity

A challenge not widely anticipated at GST's launch is the complexity created by the rapid growth of direct-to-consumer e-commerce. The same product may now flow through both traditional wholesale-retail channels (governed by standard B2B-to-B2C GST rules) and marketplace e-commerce platforms (subject to Tax Collected at Source provisions under Section 52 of the CGST Act). Managing inventory and GST compliance across these parallel channels has added meaningful operational complexity for FMCG and electronics firms — a dimension of the reform that will likely require further attention as e-commerce's share of retail continues to grow.

9.0 Conclusion and Policy Implications

This paper has provided systematic, firm-level evidence on the supply chain transformation that India's GST reform set in motion. The findings confirm that GST has been a meaningful positive force for manufacturing supply chains: large and mid-sized firms achieved real reductions in logistics costs, warehouse proliferation, and inventory carrying requirements. The ITC mechanism improved the tax efficiency of production. E-way bills materially accelerated inter-state freight movement. At the same time, the reform's benefits have not been evenly distributed. Smaller firms bore disproportionate compliance burdens in the early years and have been slower to realize efficiency gains. Structural limitations — the petroleum exclusion, the inverted duty structure in textiles, and the digital divide in compliance capability — continue to constrain the full potential of the reform.

Five policy implications emerge from the analysis:

- Petroleum inclusion should remain a priority for the next phase of GST reform. The transportation cost reduction potential — estimated at 4–6 percent — dwarfs any other single remaining policy change available.
- Targeted digital compliance support for SMEs is essential to close the large-firm/small-firm efficiency gap. This means subsidized GSP access, simplified return formats, and better ITC reconciliation tooling.

- A standing mechanism for expedited ITC refunds in structurally inverted-duty sectors would prevent the kind of liquidity squeeze experienced in textiles from recurring.
- The E-way bill threshold for intra-state movements should be rationalized to reduce compliance burden on small consignments without compromising tax monitoring.
- Real-time, analytics-driven risk profiling for GST audit selection would concentrate compliance resources where they matter most, while reducing unnecessary friction for honest taxpayers.

Looking forward, there is a larger opportunity that policy has not yet fully grasped. GST transaction data is now the most comprehensive real-time dataset of commercial goods flows in Indian economic history. Integrated with the National Logistics Policy (2022) — which aims to bring India's logistics cost-to-GDP ratio down from 13 percent toward the 8–9 percent range of comparable economies — it could inform infrastructure investment, logistics planning, and supply chain risk monitoring in ways that generate efficiency dividends well beyond what the tax reform itself produces. Realizing that potential will require genuine institutional collaboration between the Ministry of Finance, the Ministry of Commerce and Industry, and state-level logistics agencies. That governance challenge is, ultimately, as important as any of the technical or economic dimensions this paper addresses.

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