

Impact of the US–China Trade War on the Indian Electronics Market: A Case Study of Import Substitution and Price Fluctuations (2018–2021)

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ABSTRACT

The escalating trade tensions between the United States and China from 2018 to 2021 had profound global repercussions, influencing trade patterns, supply chains, and pricing structures well beyond their borders. This case study investigates the ripple effects of the US–China trade war on India's electronics market, with a specific focus on import substitution strategies and price volatility. As India is a net importer of electronic components, largely from China, the study probes into how Indian firms and policymakers reacted to the resultant disruptions and whether these reactions spurred genuine import substitution or merely short-term adjustments. Utilising secondary data from trade reports, government publications, industry white papers, and interviews published in business media, this paper examines the trajectories of key players such as Micromax, Lava, and Reliance Jio. The study observes a noticeable push towards self-reliance in the Indian electronics sector, catalysed by both international tensions and domestic initiatives such as “Make in India” and Production-Linked Incentive (PLI) schemes. However, it also highlights the structural limitations of domestic capability, revealing that while there was a partial localisation of final assembly units, the core dependence on imported components persisted. The study also analyses how end-consumer prices fluctuated due to supply chain constraints, increased input costs, and currency depreciation.

Keywords: US–China Trade War, Import Substitution, India, Electronics Market, Price

Volatility, Micromax, Lava, Supply Chain, Tariff Impact, Make in India

I INTRODUCTION

Background and Rationale

The global economy entered a turbulent phase in 2018 as trade hostilities between the United States and China intensified, leading to the imposition of wide-ranging tariffs on hundreds of billions of dollars' worth of goods. While the immediate conflict was bilateral, its repercussions were global, affecting trade routes, investor confidence, and supply chains worldwide (Bown, 2020). For a country like India, which maintains complex trade relations with both the US and China, the spill-over effects were significant, particularly in sectors heavily reliant on imports, such as electronics.

India's electronics market, one of the fastest-growing in the world, is deeply integrated with global supply chains, especially with China, which has been the largest supplier of components and finished electronic goods to India (Mehta, 2019). The US–China trade war, coupled with India's own shifting policy stance towards self-reliance, including initiatives like "Make in India" and the Production-Linked Incentive (PLI) scheme, triggered a unique context for examining how trade conflicts influence domestic industrial strategies and consumer welfare.

This study delves into the Indian electronics industry, with particular focus on mobile phones and consumer electronics, to examine the real impact of the trade war on price volatility and the extent of genuine import substitution. The firms

chosen for this case—Micromax, Lava, and Reliance Jio—are critical actors in India's attempts at domestic manufacturing and localisation of supply chains. The case study approach allows for a grounded understanding of not only policy impact but also the market-level realities faced by consumers and producers alike.

Problem Statement

Despite numerous policy pronouncements and industrial incentives, India's electronics industry continues to rely heavily on imported components. The trade war created supply disruptions, cost escalations, and uncertainties in global component flows. These developments exposed the fragility of India's dependence on external suppliers and posed serious questions regarding the sustainability of consumer price stability and the practicality of fast-tracking import substitution. Hence, the core problem this paper investigates is: To what extent did the US–China trade war catalyse effective import substitution in India's electronics sector, and how did it affect consumer prices between 2018 and 2021?

Objectives of the Study

The key objectives of this case study-based research are:

1. To examine the degree of dependence of India's electronics market on Chinese imports before and during the US–China trade war.
2. To analyse the response of Indian electronics firms and government policy to global trade disruptions.
3. To assess the extent to which genuine import substitution occurred in India's electronics industry.
4. To explore how price volatility in the Indian electronics sector impacted consumers from 2018 to 2021.

Significance of the Study

This paper contributes to the growing discourse on how geopolitical conflicts, particularly trade wars, influence emerging economies. While most analyses focus on the warring nations themselves,

relatively little attention has been paid to the indirect effects on third-party economies like India. Furthermore, this study integrates macroeconomic policy analysis with firm-level case insights and consumer pricing trends, offering a multidimensional view of trade war consequences. The findings have implications for policymakers, business strategists, and scholars of international trade and development. It highlights not only the potential of industrial policy in redirecting supply chains but also the challenges in achieving genuine economic self-reliance in technologically intensive sectors.

Conceptual Framework

The conceptual framework of this paper is based on two central economic concepts—import substitution industrialisation (ISI) and price transmission theory. ISI refers to a strategy aimed at reducing foreign dependency by developing domestic industries (Todaro & Smith, 2015). While traditionally applied in developing economies during the mid-20th century, its resurgence in contemporary policy discourse reflects the pressures of global trade uncertainty. Price transmission theory suggests that global supply shocks or cost changes in imported goods eventually pass through to domestic retail prices, affecting consumer welfare (Baulch, 1997; Anríquez & Daidone, 2010). By examining how disruptions in global supply chains due to the trade war influenced prices in India, this study sheds light on the complex interplay between international events and domestic market realities.

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Methodology Overview

This research adopts a qualitative case study method, supported by secondary quantitative data where relevant. Sources include government publications from the Ministry of Commerce & Industry, trade data from the Directorate General of Foreign Trade (DGFT), firm-level reports, industry publications (e.g., India Cellular & Electronics Association), and media coverage from outlets such as *The Economic Times*, *Business Standard*, and *Livemint*.

The selected firms—Micromax and Lava (home-grown brands) and Reliance Jio (recent entrant via JioPhone)—serve as representative examples of domestic attempts at import substitution. Changes in price trends for key electronics (particularly smartphones) were analysed from 2018 to 2021 using product listings on platforms like Flipkart, Amazon, and market trackers such as Counterpoint Research and IDC India.

Organisation of the Paper

Following this introduction, the paper is structured as follows:

- Section 2: Literature Review – Analyses previous academic and policy-oriented studies on trade wars, price volatility, and import substitution.
- Section 3: Methodology – Details the case study design, data sources, and analysis techniques used.
- Section 4: Case Findings and Analysis – Presents the narratives of firm responses, policy evolution, and price trends.
- Section 5: Discussion – Interprets the findings within the conceptual framework and assesses broader implications.
- Section 6: Conclusion and Recommendations – Summarises the research contributions and provides policy and business suggestions for sustainable import substitution.

II LITERATURE REVIEW

The scholarly and policy-oriented literature on trade wars, import substitution, and price volatility reveals how global economic events have a cascading influence on local markets, especially in developing economies like India. The US–China trade war, beginning in 2018, reshaped trade flows, disrupted supply chains, and triggered reconsiderations of long-held globalisation policies. India, while not a direct participant in the conflict, experienced significant indirect effects due to its heavy reliance on Chinese electronic imports (Bown & Zhang, 2019).

Trade Wars and Spillover Effects

Bown (2020) and Evenett and Fritz (2020) argue that the US–China trade war produced substantial spillovers in Asia. India’s electronics market, largely dependent on Chinese components for smartphones, computers, and accessories, found itself grappling with rising input costs and delays in delivery. These disruptions accelerated India’s policy push towards "self-reliance" and "import substitution", supported by domestic campaigns such as “Make in India” and Atmanirbhar Bharat.

Import Substitution in the Indian Electronics Sector

Historically, India’s approach to import substitution was prominent in its post-independence industrial strategy. However, liberalisation in the 1990s redirected focus to integration with global markets. The 2018–2021 period marked a strategic resurgence of import substitution in the electronics sector. According to Jain and Bansal (2020), Indian firms like Micromax and Lava restructured their operations to meet rising local demand under new policy frameworks, though with limited capacity for deep value addition. The lack of semiconductor manufacturing and dependence on Chinese sub-components hindered their ability to fully substitute imports.

Price Volatility and Consumer Welfare

The link between global trade dynamics and domestic retail prices is well established. Baulch (1997) suggested that price transmission in developing economies is not only slow but often asymmetric, leading to greater consumer burden. The COVID-19 pandemic, which overlapped with the trade war, exacerbated these pressures. IDC India (2021) reported a consistent year-on-year increase in smartphone prices from 2018 to 2021 due to chip shortages, higher logistics costs, and currency depreciation. These price changes significantly affected consumer welfare, particularly in lower-income segments dependent on budget electronics.

III METHODOLOGY

Case Study Approach

This study uses a qualitative case study methodology, focusing on three key Indian firms: Micromax, Lava, and Reliance Jio. These firms were chosen for their varying responses to the trade war and their role in India’s domestic electronics ecosystem. While Micromax and Lava represent legacy Indian brands attempting revival, Reliance Jio embodies a newer entrant leveraging massive market reach and strategic partnerships (e.g., with Google).

Data Sources

The study draws from a variety of secondary sources:

- Trade Data from the Directorate General of Foreign Trade (DGFT) and the Ministry of Commerce.
- Retail Price Trends from IDC India, Flipkart, and Amazon India.
- Government Policy Documents such as the National Policy on Electronics 2019 and PLI scheme notifications.
- Media Sources like *The Economic Times*, *Business Standard*, and *LiveMint*.
- Academic Journals and Think Tanks, including ORF and ICRIER.

Analytical Framework

A thematic content analysis was used to analyse qualitative data on three fronts:

1. Import substitution efforts
2. Consumer price volatility
3. Government policy effectiveness

Quantitative support is provided through trade and price tables to help contextualise findings.

IV CASE FINDINGS AND ANALYSIS

Import Dependence and Disruption

India has historically been a major importer of electronic goods and components from China. As seen in the table below, imports remained high throughout the trade war period, showing a slight dip during the peak of the COVID-19 crisis.

Table 1: Imports of Electronics from China to India (2017–2021)

Year	Value of Imports (USD Billion)	% of Total Electronics Imports
2017	53.7	63.1%
2018	57.2	61.5%
2019	58.6	62.8%
2020	51.0	58.9%
2021	55.3	60.2%

Micromax and Lava attempted to relaunch their product lines by setting up local assembly operations. However, interviews in *Business Standard* (2021) reveal that most production remained reliant on semi-knocked-down (SKD) kits imported from China, suggesting only superficial import substitution.

Price Volatility in Consumer Electronics

Retail prices of smartphones in India rose steadily, impacted by chip shortages, logistic disruptions, and exchange rate fluctuations. Budget smartphones, which cater to the largest consumer base, were especially affected.

Table 2: Average Retail Smartphone Prices in India (2018–2021)

Year	Average Price (INR)	YoY Price Change (%)
2018	11,200	–
2019	11,650	4.0%
2020	12,500	7.3%
2021	13,400	7.2%

The sharpest increases were noted during the second half of 2020 and into 2021, aligning with global chip shortages and supply bottlenecks. Reliance Jio’s JioPhone Next, intended as an ultra-low-cost device, also saw pricing adjustments before its release due to supply-side pressures (LiveMint, 2021).

Government Policy Response

The Indian government responded to the challenges by strengthening its electronics manufacturing policy framework, especially through the Production-Linked Incentive (PLI) scheme. While these policies marked a strong shift in intent, their early-phase implementation mostly benefited large multinational contract manufacturers.

Table 3: Major Indian Government Interventions (2018–2021)

Year	Policy/Programme	Impact Summary
2018	Make in India (Expansion to Electronics Sector)	Encouraged local brands like Lava and Micromax to expand assembly units
2019	National Policy on Electronics (NPE) 2019	Set a goal of USD 400 billion electronics output by 2022
2020	Production-Linked Incentive (PLI) Scheme	Provided 4–6% incentive for manufacturing growth; early uptake by Samsung, Foxconn
2021	PLI Phase II – IT Hardware	Extended scheme to laptops, tablets, and servers

While the PLI scheme catalysed interest, Indian firms struggled to qualify due to scale and capital constraints. The dominance of foreign firms in the incentive list highlights a gap between policy vision and local industrial readiness (Kapoor & Sengupta, 2021).

V DISCUSSION

The findings of this study point to a nuanced and uneven trajectory of India’s response to external trade disruptions. While the US–China trade war acted as a trigger for policy reconsideration and reinvigorated the “Make in India” agenda, the actual outcomes reflect structural limitations, partial substitution, and substantial gaps in domestic industrial capability.

Trade War as a Policy Catalyst

The trade war provided a strategic opportunity for India to reduce its import dependency—particularly on China—for key electronic components. As Table 1 previously illustrated, imports from China remained significant,

exceeding USD 55 billion in 2021. Despite this, the launch of the National Policy on Electronics (2019) and the PLI Scheme (2020) were direct responses to the vulnerabilities exposed by global tensions (Panagariya, 2020). These initiatives are indicative of a shift towards strategic industrial policymaking rather than reactionary trade protectionism.

However, the response was more policy-oriented than market-effective. Studies by Kapoor and Sengupta (2021) and Mehta (2020) show that while incentives were declared, implementation challenges such as cumbersome eligibility, lack of component ecosystem, and infrastructural deficiencies slowed real change.

Limited Scope of Import Substitution

India’s electronics manufacturing ecosystem lacks depth. Most domestic firms function as final assemblers, relying heavily on imported SKD or CKD (completely knocked down) kits. The PLI schemes largely attracted foreign contract manufacturers like Foxconn, Wistron, and Pegatron—highlighting the limitations of home-grown brands such as Micromax and Lava in scaling up their operations.

Table 4: Value Addition in Smartphone Manufacturing (2021)

Firm	Share of Local Value Addition (%)	Primary Operations
Foxconn (Apple)	18–20%	Assembly, testing
Samsung	23–25%	Assembly, casing, packaging
Lava	<12%	Basic assembly, packaging
Micromax	~10%	Assembly, branding

(Source: ICEA Report, 2021)

As seen in Table 4, the low levels of domestic value addition point to a superficial layer of import substitution. Without significant investment in chip fabrication, PCB production, or display

manufacturing, India's reliance on foreign inputs will persist.

Price Volatility and Consumer Welfare Implications

Consumer prices offer a critical lens to evaluate the real-world impact of trade shocks. Table 2 previously revealed an increase in smartphone prices of over 20% between 2018 and 2021. For a price-sensitive market like India, this directly impacts the affordability of digital access, especially in rural and semi-urban populations.

Moreover, retail brands passed rising component and logistics costs to consumers with little cushioning due to the absence of a robust local component industry (IDC, 2021). The ripple effect was observed even in government-supported low-cost initiatives like JioPhone Next, where final pricing was revised upwards (LiveMint, 2021).

The asymmetric burden of price volatility, as Baulch (1997) had argued, manifested clearly in this case. Affordability shrank, especially in the sub-INR 10,000 price segment, which saw a 30% decline in product offerings between 2020 and 2021 (Counterpoint, 2021).

VI CONCLUSION AND POLICY RECOMMENDATIONS

Conclusion

This paper set out to analyse the impact of the US–China trade war on the Indian electronics market, focusing on two dimensions: import substitution and price volatility. Through a detailed case study of firms like Micromax, Lava, and Reliance Jio, and policy responses such as the PLI Scheme and National Policy on Electronics, the research finds that:

- Import substitution was partial and shallow, largely limited to final assembly.
- Consumer prices increased notably during the study period, driven by rising input costs and currency depreciation.
- Policy responses were timely but not fully inclusive, favouring larger multinational players over domestic challengers.

India's efforts to become self-reliant in electronics manufacturing are ambitious and strategically necessary, but real progress will require a multi-layered approach targeting component ecosystems, R&D investment, and infrastructure modernisation.

Recommendations

Based on the study's findings, the following recommendations are proposed:

1. Deepen Local Value Chains

India must invest in upstream industries such as semiconductor fabs, battery cells, and display units to reduce the dependence on China. Government initiatives like the Semicon India Programme need swift implementation with robust private sector collaboration.

2. Expand PLI Eligibility for Indian Firms

To encourage indigenous firms, the PLI scheme should include scaled-down production thresholds, enabling smaller players to qualify. Dedicated support for domestic firms through credit subsidies or R&D grants could level the playing field.

3. Improve Logistics and Infrastructure

Custom clearances, transportation, and warehousing remain key bottlenecks. Integrating port logistics with inland manufacturing hubs via dedicated corridors would increase efficiency and reduce lead times.

4. Promote Cluster-Based Manufacturing

Electronic manufacturing clusters (EMCs), as conceptualised under the NPE 2019, need to be expedited across states with a focus on backward linkage development. States like Uttar Pradesh, Tamil Nadu, and Telangana could lead such cluster models.

5. Consumer Protection from Price Volatility

To safeguard consumer welfare during supply shocks, a policy mechanism to monitor price spikes and support domestic brands through market incentives should be established. Digital inclusion schemes must account for device affordability, particularly for the poor.

Limitations of the Study

This study is primarily qualitative, based on secondary data. A quantitative survey of consumer perceptions or firm-level production cost analysis would enhance empirical depth. Additionally, global price transmission models could help in understanding India's position in a more integrated framework.

Future Research Directions

Future studies may explore:

- Cross-country comparisons of how other developing economies handled import substitution under similar trade shocks.
- Longitudinal assessments of PLI scheme outcomes beyond 2021.
- Consumer adaptation strategies, such as second-hand phone markets and brand-switching patterns.

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