

SYNOPSIS

**ESSAYS ON EXCHANGE RATE
PASS THROUGH**

THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY IN ECONOMICS OF
JADAVPUR UNIVERSITY, KOLKATA

DARPAJIT SENGUPTA

**DEPARTMENT OF ECONOMICS
JADAVPUR UNIVERSITY
KOLKATA-700032, INDIA**

2025

The study of Exchange Rate Pass-Through (ERPT) occupies a central position in international economics and policy debates because it connects exchange rate movements with domestic inflation, external competitiveness, and overall macroeconomic stability. For emerging economies such as India, the question is particularly critical. Over the last three decades, India has transitioned from a relatively closed economy with stringent trade controls to one of the world's largest and fastest-growing trading nations. This shift has exposed the economy to exchange rate volatility stemming from both domestic and external shocks. Episodes such as the Asian financial crisis of the late 1990s, the global financial crisis of 2008, the taper tantrum of 2013, the pandemic-induced disruptions in 2020, and the recent geopolitical turmoil leading to oil price spikes have all highlighted how vulnerable the Indian economy remains to currency fluctuations. At the same time, India's evolving institutional environment, especially the adoption of a formal inflation-targeting framework by the Reserve Bank of India (RBI) in 2016, has made it imperative to understand how exchange rate changes influence not only actual prices but also inflation expectations. Moreover, India's increasing participation in global value chains, its dependence on imported intermediates, and its still limited use of the rupee as an invoicing currency have created a complex setting where ERPT dynamics are unlikely to follow simple, uniform patterns. Against this backdrop, the present thesis undertakes a comprehensive and multi-dimensional analysis of ERPT in India, combining econometric techniques with structural modeling to produce both empirical evidence and policy-relevant insights.

The broader literature provides a strong foundation for the inquiry but also reveals important limitations. Traditional theories rooted in the law of one

price and purchasing power parity once suggested that exchange rate movements would be fully reflected in domestic prices. However, the empirical evidence beginning in the 1980s demonstrated that pass-through was often incomplete, especially in advanced economies. Pioneering studies by Krugman (1987) showed how exporters adjust their mark-ups in response to demand elasticities and competitive pressures, a phenomenon described as pricing-to-market. Knetter (1995) work further demonstrated that exporters' strategies vary by destination market, leading to heterogeneity in pass-through elasticities. Later contributions incorporated nominal rigidities through staggered contracts, à la Calvo or Taylor (1980), which explain why prices do not adjust immediately in response to currency shocks. In more recent years, the focus has shifted to invoicing practices, with Gopinath (2010) and others articulating the dominant currency paradigm, under which the widespread use of the U.S. dollar in global trade substantially reduces the sensitivity of bilateral prices to bilateral exchange rate fluctuations. Parallel to these developments, empirical research has confirmed that ERPT is generally lower and declining in advanced economies, largely due to credible monetary frameworks, inflation anchoring, and deeper GVC integration. By contrast, in emerging economies ERPT tends to be higher, more volatile, and often asymmetric, reflecting weaker monetary credibility, greater dependence on imported inputs, and institutional rigidities.

The Indian literature on ERPT, while informative, is still relatively limited compared to the global evidence. Early studies confirmed that pass-through was incomplete but often focused only on import prices, neglecting exports altogether. Many of these analyses relied on aggregate data that masked heterogeneity across sectors and products. Only a few attempts were made to

explore whether ERPT differs between appreciation and depreciation episodes, or whether it has evolved over time with changing policy regimes. More recent contributions have examined the role of global value chain participation in moderating ERPT, as well as the declining influence of exchange rates on inflation in the era of inflation targeting. Nevertheless, significant gaps remain. Export price pass-through remains underexplored, despite India's growing global export footprint. The possibility of asymmetric ERPT has not been studied systematically. The role of invoicing practices and pricing-to-market strategies is inadequately addressed in the Indian context. The impact of ERPT on inflation expectations has been neglected, even though expectations are crucial in the operation of monetary policy. Finally, there has been an attempt made to embed ERPT into a structural macroeconomic model to capture dynamic feedback loops. These gaps provide the motivation for the present thesis.

In line with these observations, the thesis sets out four main objectives. First, it measures the magnitude and dynamics of ERPT into India's import and export prices, distinguishing between short-run and long-run effects and testing explicitly for asymmetry. Second, it investigates heterogeneity in ERPT across products, partner countries, and sectors, with particular attention to the role of pricing-to-market, invoicing structures, and GVC participation. Third, it analyzes the impact of ERPT on inflation expectations within India's inflation-targeting framework, seeking to understand how households form expectations in response to exchange rate shocks. Fourth, it embeds ERPT into a New Keynesian Dynamic Stochastic General Equilibrium (DSGE) model to capture structural interactions and simulate policy-relevant dynamics. These objectives

are ambitious but necessary to develop a holistic understanding of ERPT in India and to provide policymakers with actionable insights.

To achieve these objectives, the thesis employs a mixed-methods approach, tailoring methodologies to the questions at hand. For the analysis of aggregate ERPT into import and export prices, autoregressive distributed lag (ARDL) models and error correction mechanisms are employed. These models are well suited to distinguish between short-run and long-run dynamics while accounting for non-stationarity and cointegration. For the analysis of heterogeneity, the study relies on disaggregated customs data at the product and partner level, estimated through panel regressions that control for unobserved heterogeneity and cross-sectional dependence. For the investigation of inflation expectations, survey data are combined with econometric techniques to assess how exchange rate shocks influence households' forecasts of future inflation, and whether these effects are symmetric or nonlinear. Finally, the DSGE model is calibrated to Indian data, incorporating features such as incomplete pass-through, staggered price setting, and alternative invoicing regimes, to simulate how ERPT interacts with shocks and policy responses. This methodological pluralism enhances both the robustness and the interpretability of results.

The empirical findings presented in the second chapter provide the first substantive insights. The analysis confirms that ERPT in India is incomplete: only about twenty-three percent of exchange rate movements are transmitted to export prices and around forty-five percent to import prices. These magnitudes are consistent with the global evidence for emerging economies but clearly indicate that exporters and importers in India absorb a substantial portion of exchange rate shocks. The time dynamics show that short-run pass-through is

weaker, reflecting contractual rigidities and staggered adjustments, while long-run pass-through is somewhat stronger. Perhaps the most important finding is that ERPT is asymmetric: appreciations of the rupee lead to sharper declines in export and import prices, whereas depreciations have weaker upward effects. This asymmetry suggests that exporters often compress their margins during depreciation rather than passing the benefits to foreign consumers, which undermines the effectiveness of currency depreciation as a policy tool for stimulating exports. The chapter thus establishes a critical baseline: ERPT in India is neither complete nor symmetric, and its dynamics are heavily influenced by institutional and market rigidities.

The third chapter deepens the analysis by focusing on heterogeneity across products and destinations. Using disaggregated customs-level data, the study uncovers significant variation in pass-through. Commodities and fuels exhibit near-complete ERPT, reflecting dollar pricing and globally determined markets, while differentiated goods such as pharmaceuticals, electronics, and machinery exhibit very low pass-through due to the greater pricing power of exporters. Country-level heterogeneity is equally striking. Exports to advanced economies such as the United States, Japan, and Germany exhibit lower pass-through than exports to emerging economies such as Bangladesh and Sri Lanka. This reflects differences in demand elasticity, competitive structures, and contractual practices. Evidence of pricing-to-market behavior is strong: Indian exporters adjust local-currency prices and margins depending on market conditions, rather than applying uniform pass-through across all destinations. Furthermore, participation in global value chains emerges as a dampening factor, as costs and revenues are spread across multiple borders,

diluting the effect of any single exchange rate change. These findings highlight that ERPT in India is not a single parameter but a mosaic of outcomes shaped by product characteristics, partner markets, and global production networks.

The fifth chapter extends the scope of analysis by linking ERPT to inflation expectations within N-ARDL framework. The econometric analysis of household survey data on inflation expectation shows that ERPT significantly influences expectations but in a nonlinear and asymmetric manner. Appreciations reduce inflation expectations more strongly than depreciations raise them, indicating that appreciation of currency anchor expectations more effectively than depreciation. At the same time, past inflation remains a dominant factor shaping expectations, underscoring the importance of credibility in the inflation-targeting framework.

In the fifth chapter, the DSGE model simulations provide additional structural insights. The model confirms that ERPT is stronger for tradable goods than for non-tradables, that monetary policy shocks generate near-complete pass-through while external shocks yield incomplete adjustments, and that invoicing practices critically shape outcomes. In a surprising result, ERPT is strongest under the dominant currency paradigm, moderate under local currency pricing, and weakest under producer currency pricing, contrary to traditional theory but consistent with the contractual rigidities observed in practice. Together, the findings of this chapter demonstrate that ERPT in India is not only a matter of prices but also a determinant of expectations, and that its structural features depend on how global trade and monetary systems are organized. The final chapter synthesizes these results and draws broader policy lessons.

The central conclusion is that ERPT in India is incomplete, asymmetric, heterogeneous, and conditioned by structural factors such as invoicing practices and GVC participation. This has profound implications for policy. Depreciation cannot be relied upon as a simple tool for boosting exports or correcting current account deficits. Instead, it must be complemented with supply-side reforms that reduce costs, improve infrastructure, and promote competitiveness. Export diversification is necessary to reduce vulnerability to asymmetric ERPT, while rupee invoicing and regional settlement arrangements can strengthen monetary autonomy. For monetary policy, the asymmetric influence of ERPT on inflation expectations requires the RBI to incorporate ERPT into its forecasting models and communication strategies. Structural reforms are equally important: MSMEs must be provided with hedging instruments, local value addition must be promoted to reduce import dependence, and non-tradable sectors such as housing and logistics must be deregulated to reduce inflation persistence.

The thesis also outlines future research directions, recognizing the evolving nature of ERPT in a rapidly changing global environment. Linking customs-level trade data with firm-level balance sheets could illuminate how financial conditions, mark-ups, and hedging strategies influence ERPT. Extending the analysis to services trade, particularly IT and digital services, would capture an increasingly important component of India's external sector. Investigating the implications of rupee internationalisation, climate change, and the green energy transition would align ERPT analysis with emerging global challenges. Comparative studies across BRICS and other emerging economies

features. The policy message is clear: exchange rate management must be integrated with trade, monetary, and structural reforms, while credibility and resilience must be strengthened to manage external volatility. As India advances toward its ambition of becoming a developed economy by 2047, its ability to understand and manage ERPT will be central to sustaining growth, ensuring stability, and enhancing global competitiveness.

Sanjayit Sengupta
15/9/2025

Sankar Sinha
15.09.2025

PROFESSOR
DEPARTMENT OF ECONOMICS
JADAVPUR UNIVERSITY
KOLKATA - 700 032