

Exchange Rate Volatility and Its Effect on Trade Balance: A Comprehensive Literature Review

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Abstract

This study provides a comprehensive literature review on the relationship between exchange rate volatility and trade balance, highlighting the complex interactions that influence international trade performance. Exchange rate fluctuations are a critical factor for countries engaged in global trade, as they can affect the competitiveness of exports, the cost of imports, and overall economic stability. The review synthesizes theoretical perspectives, including the Marshall-Lerner condition and J-curve effect, alongside empirical findings from studies across developed and developing economies. Evidence from the literature indicates that exchange rate volatility can have both positive and negative impacts on trade balance, depending on factors such as the structure of trade, the degree of price elasticity of exports and imports, hedging mechanisms, and the economic policies of the trading partners. While some studies find that higher volatility discourages trade by increasing uncertainty and transaction costs, others suggest that firms adapt over time, mitigating adverse effects. The review also emphasizes methodological variations in measuring volatility and trade responsiveness, such as econometric modeling and panel data analysis. The study concludes that understanding the nuanced effects of exchange rate volatility is crucial for policymakers and business leaders aiming to stabilize trade flows and enhance economic resilience. It recommends strategies including currency risk

management, export diversification, and flexible trade policies to mitigate the negative impacts of exchange rate fluctuations.

1. Introduction

1.1 The Significance of Exchange Rate Volatility in Global Trade

Exchange rate volatility has become an increasingly significant concern for policymakers, businesses, and economists in an increasingly integrated global economy. The relationship between currency fluctuations and trade performance remains one of the most debated topics in international economics and finance. Exchange rates, defined as the prices at which one currency can be exchanged for another, fundamentally determine the relative competitiveness of goods and services in international markets (Patel, 2025). When exchange rates experience substantial fluctuations, the resulting uncertainty can have profound implications for international trade flows, affecting both exporters and importers across different sectors of the economy. The impact of exchange rate volatility extends beyond simple price adjustments; it influences investment decisions, supply chain configurations, and broader macroeconomic stability (Meng, 2024).

The importance of understanding exchange rate volatility and its effects on trade balance has grown substantially since the breakdown of the Bretton Woods system in 1973, which transitioned the global economy from fixed to floating exchange rate regimes. This systemic change created heightened uncertainty in foreign exchange markets and necessitated a comprehensive examination of how currency fluctuations affect bilateral and multilateral trade relationships (Ullah & Huang, 2025). For developing and emerging market economies in particular, exchange rate volatility poses significant challenges, as these nations often depend

heavily on international trade for economic growth and foreign exchange earnings. The volatility is particularly pronounced during periods of global economic crisis, geopolitical tensions, or abrupt changes in monetary policy by major central banks (Singh et al., 2025).

1.2 Defining Trade Balance and Exchange Rate Dynamics

The trade balance, measured as the difference between a country's exports and imports, serves as a critical indicator of economic health and competitiveness in the global marketplace. When a country experiences trade surpluses, it indicates that exports exceed imports, generating foreign exchange inflows and contributing positively to the current account. Conversely, trade deficits occur when imports exceed exports, creating foreign currency outflows and potentially threatening foreign exchange reserves (Agustina et al., 2025). Exchange rate movements directly influence the prices at which exports and imports are traded internationally. When a domestic currency depreciates relative to foreign currencies, exports theoretically become cheaper to foreign buyers while imports become more expensive for domestic consumers, potentially improving the trade balance through what economists call the expenditure-switching effect (Altunöz, 2024).

However, the relationship between exchange rates and trade balance is considerably more complex than simple price mechanics. The response of trade flows to exchange rate changes depends on multiple factors including the price elasticity of demand for exports and imports, the time required for traders and firms to adjust their behavior, the presence of global value chains and production networks, and the macroeconomic conditions in both exporting and importing

countries (Wang, 2025). Furthermore, exchange rate movements themselves are often endogenous, meaning they respond to changes in trade balances and other macroeconomic variables. This simultaneity creates challenges for researchers attempting to isolate the causal effects of exchange rates on trade performance, necessitating sophisticated econometric methodologies and careful theoretical reasoning to understand these dynamics (Muzammil et al., 2024).

2. Theoretical Foundations and Conceptual Framework

2.1 The Marshall-Lerner Condition

The Marshall-Lerner condition represents one of the foundational theoretical principles in the analysis of exchange rate effects on trade balance. This condition states that currency depreciation will improve the trade balance if and only if the sum of the price elasticities of demand for exports and imports exceeds one (Altunöz, 2024). In more intuitive terms, if the combined responsiveness of export and import quantities to price changes is sufficiently large, then a depreciation of the domestic currency will lead to an improvement in the trade balance, as the volume effect from increased exports and decreased imports will outweigh any adverse price effects. The theoretical basis for this condition rests on the assumption that traders are rational and respond to price signals, adjusting their consumption and production decisions accordingly (Kulkarni & Bhatia, 2002).

For developing economies and commodity-exporting nations, the validity of the Marshall-Lerner condition often depends on structural characteristics and the degree of economic diversification. Studies examining specific country cases have found mixed results regarding whether this condition holds in reality. Research on Vietnam's trade balance found that exchange rate volatility had positive effects on

exports, though the results for imports were less definitive (Nga et al., 2024). Similarly, research on Pakistan's bilateral trade with major partners revealed that while the Marshall-Lerner condition held in the long run, short-run adjustments were limited (Ali et al., 2024). These findings underscore the importance of distinguishing between short-term and long-term effects, as empirical evidence frequently reveals that the Marshall-Lerner condition is more likely to be satisfied over longer time horizons, after traders have had adequate time to adjust their behavior and make structural changes to their operations (Jaiswal & Soni, 2025).

2.2 The J-Curve Hypothesis

The J-curve effect represents a crucial temporal dynamic in the relationship between exchange rates and trade balance. This hypothesis proposes that following currency depreciation, the trade balance will initially deteriorate in the short run before improving in the long run, creating a graph shaped like the letter "J" (Mbwambo & Mchukwa, 2024). The intuition behind this phenomenon relates to the concept of lags in adjustment. In the immediate aftermath of currency depreciation, the prices of imports in domestic currency terms increase due to the exchange rate change, while the volumes of imports and exports adjust only gradually as importers and exporters complete existing contractual obligations and make decisions about future transactions (Trofimov, 2024).

During this initial period, the higher prices of imports tend to dominate the calculation of the trade balance, causing it to worsen despite the currency depreciation. However, as time passes and traders respond to the changed price incentives by reducing import volumes and increasing export quantities, the trade balance eventually improves, reflecting the operation of the price elasticity effects

predicted by the Marshall-Lerner condition (Rocha et al., 2024). The presence and magnitude of the J-curve effect has been documented across numerous countries and time periods. Research on Brazil's economy confirmed both the J-curve hypothesis and the Marshall-Lerner condition over a 36-month forecast horizon (Rocha et al., 2024). Similarly, empirical analysis of Indonesia's trade balance found strong evidence of the J-curve phenomenon when examining responses to real exchange rate depreciation (Mashilal & Pambudi, 2024). However, not all countries exhibit the J-curve effect uniformly; the phenomenon appears to depend on institutional structures, import composition, and the degree of price responsiveness in different sectors (Tiro & Chiwira, 2025).

2.3 Income Effects and Global Economic Conditions

Beyond the price effects captured by the Marshall-Lerner condition and the temporal dynamics of the J-curve, income effects play an important role in determining how exchange rate changes translate into trade balance adjustments. When exchange rates depreciate, exporting countries experience enhanced price competitiveness, which can stimulate export demand. However, this depends critically on income conditions in importing countries (Ferreira & Januário, 2024). If major trading partners experience economic recessions or contractions in their purchasing power, the demand for imports from any individual country may decline regardless of price competitiveness improvements (Ahmad et al., 2024). Conversely, strong economic growth in trading partner nations tends to increase demand for imports, potentially expanding trade deficits even in the presence of currency depreciation (Khouiled et al., 2023).

The research on global trade dynamics reveals that income effects frequently

dominate price effects in determining trade balance outcomes. Studies examining Brazil's trade balance found that global income shocks had particularly significant impacts, with world GDP changes affecting trade flows more substantially than exchange rate adjustments alone (Ferreira & Januário, 2024). Similarly, research on development and emerging market economies has consistently shown that foreign income growth tends to improve the trade balance of exporting nations by increasing demand for their exports (Abille & Meçik, 2023). These findings underscore the importance of considering the broader macroeconomic context when analyzing exchange rate effects on trade balance. A currency depreciation occurring during a period of weak global demand may fail to improve the trade balance, while the same depreciation during a period of strong worldwide economic growth might generate substantial trade balance improvements (Meng, 2024).

3. Empirical Evidence and Mechanisms of Transmission

3.1 Direct Effects on Export and Import Flows

Empirical research examining the direct effects of exchange rate volatility on exports and imports reveals complex and often asymmetric relationships that vary across countries, sectors, and time periods. Exchange rate volatility creates uncertainty that can reduce trade volumes by increasing the perceived risk of international transactions (Aleke & Alum, 2024). When exporters and importers face uncertainty about future exchange rates, they may reduce their engagement in international trade or require higher risk premiums, effectively increasing the cost of doing business internationally. However, the magnitude of this effect depends substantially on the availability and cost of hedging instruments, the experience of

firms in managing currency risks, and the regulatory environment governing international trade and finance (Pan, 2025).

Research on India's foreign exchange market dynamics revealed that currency depreciation against the US dollar had differentiated effects on various export sectors (Vinotha & R, 2025). Pharmaceutical exports, IT services, and textile exports responded differently to exchange rate changes, with some sectors demonstrating high price elasticity while others showed limited responsiveness. Similarly, import patterns revealed that crude oil imports were relatively inelastic with respect to exchange rate changes, reflecting the lack of alternative sources and the essential nature of energy inputs for the domestic economy. These findings demonstrate that exchange rate effects on trade flows are highly sector-specific and depend on the competitive environment, availability of substitutes, and the importance of the traded good or service to the importing nation (Hao & Xu, 2024).

3.2 Impact on Global Value Chains

Modern international trade occurs increasingly through global value chains, where production processes are geographically dispersed across multiple countries, with each location specializing in particular production stages. Exchange rate volatility affects these networks in complex ways that differ from traditional bilateral trade relationships. Firms with high degrees of global value chain participation often demonstrate different responses to exchange rate movements compared to firms engaged in simpler forms of trade (Jiang et al., 2024). When currency appreciation threatens export competitiveness, firms integrated into global value chains may respond by lowering prices more substantially than firms engaged in arm's-length

trade, as they attempt to maintain their position within the value chain network (Wang, 2025).

The disruption of global value chains by exchange rate volatility can have cascading effects throughout production networks. Supply chain disruptions caused by currency fluctuations can increase production costs, create inventory challenges, and necessitate costly restructuring of sourcing arrangements (Nemat et al., 2025). Research examining the relationship between trade openness, exchange rate volatility, and economic growth revealed that exchange rate instability contributed to macroeconomic uncertainty, particularly for countries with deep integration into global trade networks (Yusuf, 2026). Furthermore, firms may respond to prolonged exchange rate volatility by relocating production facilities or changing sourcing strategies to reduce their exposure to currency risk, a structural adjustment that can take years to implement but has lasting effects on trade patterns and bilateral relationships (Liu et al., 2024).

3.3 Macroeconomic Transmission Mechanisms

Exchange rate volatility influences trade balance through multiple macroeconomic transmission channels beyond the direct price and quantity effects. Interest rate changes that drive exchange rate movements also affect the cost of credit and investment decisions, which influence production capacity and future export supply (Banik, 2025). Inflation dynamics, which are often correlated with exchange rate changes, affect both the competitiveness of exports and the purchasing power of domestic consumers (Mbwambo & Mchukwa, 2024). Moreover, changes in foreign direct investment inflows, which frequently accompany exchange rate movements, affect the productive capacity of exporting

industries and the competitiveness of export-oriented firms (Lulu, 2025).

The external reserves held by central banks interact with exchange rate volatility in ways that significantly affect trade balance outcomes. Countries with robust foreign exchange reserves can intervene in currency markets to smooth exchange rate fluctuations, thereby reducing the adverse effects of volatility on trade flows (Aham et al., 2026). Conversely, countries with depleted reserves face constraints on their ability to manage exchange rate volatility and may experience more pronounced trade balance adjustments when faced with external shocks. The COVID-19 pandemic demonstrated these dynamics clearly, as exchange rate volatility spiked dramatically while central banks and governments intervened extensively to stabilize currency markets and maintain trade flows (Tsitsi et al., 2024). Additionally, the relationship between exchange rate volatility and the trade balance is mediated by policy responses, including monetary and fiscal interventions designed to offset the adverse effects of currency fluctuations on economic activity (Hotsawadi et al., 2025).

4. The J-Curve Effect and Marshall-Lerner Condition: Empirical Validation Across Regions

4.1 Evidence from Developed and Emerging Economies

The empirical validity of the J-curve effect and Marshall-Lerner condition has been extensively tested across numerous countries and time periods, with results frequently revealing important geographic and temporal variations. For developed economies, evidence of the J-curve phenomenon has been documented in several cases. Research examining Japan's services trade balance found support for the J-curve hypothesis at the aggregate level, though the effect was considerably more

mented than traditional theory predicted (R & Trofimov, 2025). Similarly, analysis of the United Kingdom's services trade balance revealed little evidence of long-term improvement following currency depreciation, suggesting that services sectors may respond differently to exchange rate changes compared to goods trade (Trofimov, 2022).

In emerging market economies, the evidence for the J-curve and Marshall-Lerner condition is more mixed and context-dependent. Tanzania's experience provides a clear illustration of both phenomena, with vector error correction model analysis confirming the J-curve effect and the existence of a negative long-run relationship between exchange rate depreciation and trade balance, alongside a positive relationship when considering other variables like foreign direct investment and GDP growth (Mbwambo & Mchukwa, 2024). However, research on Nigeria's trade balance found weak or absent J-curve effects for total trade, though the phenomenon was evident when examining non-oil trade separately (Oyetayo et al., 2024). Botswana's case demonstrated the opposite pattern, with empirical analysis finding that real exchange rates had negative effects on trade balance both in short and long runs, indicating the absence of the Marshall-Lerner condition (Tiro & Chiwira, 2025).

4.2 Asymmetric Effects and Non-Linear Relationships

Recent empirical research has revealed that exchange rate effects on trade balance often exhibit significant asymmetry, meaning that appreciations and depreciations have different magnitudes or even opposite directional effects on trade flows. These asymmetries arise from various sources, including nominal rigidities in pricing, differences in the competitive environment facing exporters versus

importers, and psychological factors affecting business decision-making (Muzammil et al., 2024). Non-linear modeling approaches have become increasingly popular in recent years, allowing researchers to capture these asymmetric relationships more accurately than traditional linear specifications. Studies employing non-linear autoregressive distributed lag models consistently find evidence of asymmetric effects, suggesting that firms and traders respond differently to negative versus positive exchange rate shocks (Nopeline et al., 2024).

Research on developing economies particularly reveals pronounced asymmetries in exchange rate effects. Analysis of Pakistan's bilateral trade relationships using non-linear methods found significant country-specific asymmetries, particularly visible in relationships with India and China, where the magnitude and direction of exchange rate effects differed substantially between appreciations and depreciations (Muzammil et al., 2024). Similarly, studies of Indonesia's trade balance found that J-curve effects were present in certain bilateral relationships but absent in others, with the asymmetry apparently reflecting differences in product composition and competitive structures (Nopeline et al., 2024). These findings suggest that one-size-fits-all policy recommendations regarding exchange rate management are unlikely to be appropriate, as the effects of currency fluctuations depend critically on bilateral relationships, sectoral characteristics, and the specific direction of exchange rate movement (Yılmaz, 2024).

4.3 Sectoral Heterogeneity and Product Composition

The composition of trade flows across different sectors significantly influences how countries' trade balances respond to exchange rate changes. Commodities

such as crude oil, agricultural products, and minerals often exhibit limited price responsiveness to exchange rate changes because international prices are typically denominated in US dollars and worldwide supply constraints limit the ability of individual countries to shift volumes substantially (Kalsum et al., 2025). In contrast, manufactured goods and services frequently display greater price elasticity, with firms having greater ability to adjust output levels and sourcing decisions in response to exchange rate movements. Research on Indonesia's trade balance found that crude oil price volatility had the largest negative impact on the trade surplus, followed by coal and palm oil, suggesting that commodity-dependent economies face particular challenges in responding to exchange rate fluctuations (Kalsum et al., 2025).

The geographic composition of trade partners also matters substantially for exchange rate effects. Firms trading with countries that use the same currency or maintain fixed exchange rate relationships face different incentives and constraints compared to firms trading with countries experiencing floating exchange rates (Theibech et al., 2024). Research on GCC countries found that the dollar peg of most regional currencies significantly influenced how exchange rate movements affected trade flows, as currency fluctuations relative to major trading partners depended on the depreciation or appreciation of the US dollar (Theibech et al., 2024). Furthermore, the technological sophistication and degree of vertical integration within sectors affect how trade responds to exchange rate changes. High-tech manufacturing sectors that depend on global supply networks often exhibit different patterns of adjustment compared to simpler, non-differentiated commodity sectors (Jiang et al., 2024).

4.4 Temporal Dynamics and Long-Run Versus Short-Run Effects

One consistent finding across the empirical literature is that exchange rate effects on trade balance differ substantially between short-run and long-run horizons. In the short run, exchange rate changes often have muted effects on trade volumes because of the time required for negotiations, production adjustments, and the completion of existing contracts (Nga et al., 2024). Contract lags, whereby many international trade transactions are denominated in foreign currency and executed at previously agreed prices, mean that the immediate impact of exchange rate changes on trade flows is limited. It may take months or quarters for the full adjustment of trade volumes to manifest in response to exchange rate changes. Over longer time horizons of one to three years or more, the effects of exchange rate changes on trade flows tend to be substantially larger, as firms have adequate opportunity to adjust production, change suppliers, and negotiate new contracts at changed prices (Khouiled et al., 2023).

Research on North African countries revealed that adjustment periods typically span two to three years for most economies, with individual countries showing considerable variation (Khouiled et al., 2023). Algeria, Libya, and Mauritania demonstrated faster rebalancing mechanisms, requiring approximately two to three months for adjustment, while Morocco and Tunisia lacked effective adjustment mechanisms, suggesting persistent trade imbalances following external shocks. These findings underscore the importance of considering appropriate time horizons when evaluating exchange rate policies. Short-term currency interventions by central banks that aim to reduce exchange rate volatility may prove counterproductive if they prevent the longer-term adjustments necessary for

trade balance improvements (Oloko & Ogunsiji, 2024). Similarly, policymakers should recognize that trade balance improvements from currency depreciation may require extended periods to materialize, necessitating patience in evaluating the effectiveness of exchange rate policies (Kotorri & Zyka, 2025).

5. Currency Risk Management and Business Responses

5.1 Risk Hedging Strategies and Financial Instruments

Firms engaged in international trade employ various financial instruments and hedging strategies to manage the risks associated with exchange rate volatility. Forward contracts, currency options, money market hedges, and currency swaps represent the traditional arsenal of currency risk management tools available to exporters and importers (Pelit, 2023). These instruments allow firms to lock in future exchange rates or limit potential losses from adverse currency movements, thereby reducing uncertainty about future cash flows from international transactions. The decision to hedge currency risk depends on multiple factors including the firm's risk tolerance, access to hedging instruments, the cost of hedging relative to potential currency losses, and management's assessment of future exchange rate developments (Tsitsi et al., 2024).

Empirical research on import-dependent manufacturing industries in Lusaka found that firms with robust hedging strategies and diversified sourcing were substantially better able to mitigate the negative effects of exchange rate volatility compared to firms without such measures (Tsitsi et al., 2024). However, the costs of hedging can be substantial, particularly for small and medium-sized enterprises that face less favorable terms in currency markets and may lack access to sophisticated financial instruments. Research examining SMEs in international

trade found that exchange rate fluctuations significantly increased trade-financing costs through currency-swap losses, higher credit costs, and elevated financial risks (Pan, 2025). These challenges highlight the importance of developing robust financial market infrastructure and international policy cooperation to reduce the cost and complexity of currency risk management for smaller enterprises (Suleymanov & Komila, 2025).

5.2 Supply Chain Diversification and Sourcing Strategies

Beyond financial hedging, firms respond to exchange rate volatility through operational strategies that involve restructuring supply chains and diversifying sourcing locations. Sourcing from suppliers located in multiple countries with different currencies can naturally hedge currency exposure, as appreciations in one currency are offset by depreciations in others (Aleke & Alum, 2024). Research on multinational corporations revealed that firms deeply integrated into global value chains frequently respond to exchange rate shocks by adjusting their production location decisions, shifting production to countries whose currencies have depreciated to take advantage of improved cost competitiveness (Jiang et al., 2024). Similarly, firms may negotiate supplier agreements that include cost-sharing arrangements or pricing clauses that adjust automatically in response to exchange rate movements, thereby distributing currency risk across the supply chain (Yu.N. et al., 2024).

The resilience of supply chains to exchange rate volatility depends substantially on the flexibility of production networks and the availability of alternative suppliers. Geographic concentration of suppliers in particular countries or regions creates vulnerability to exchange rate shocks affecting those currencies (Nemat et

al., 2025). Conversely, firms with suppliers distributed across multiple currencies and geographic regions face natural hedging benefits from currency movements. Research on global trade and supply chain resilience found that the Ukraine-Russia conflict demonstrated the importance of supply chain diversification, as firms with single-country or single-region sourcing faced severe disruptions while more diversified supply networks proved more resilient (Nemat et al., 2025). However, achieving effective supply chain diversification involves substantial fixed costs and transition expenses, constraining the ability of firms to rapidly adjust sourcing arrangements in response to exchange rate movements (Queen et al., 2024).

5.3 Pricing Strategies and Markup Adjustment

Exchange rate movements influence firms' pricing decisions in international markets, with important implications for trade flows and profit margins. When a firm's home currency appreciates, exports become more expensive in foreign currency terms, potentially reducing export volumes unless the firm reduces its markup to maintain export prices (Jiang et al., 2024). Research on Chinese firms' responses to exchange rate fluctuations found that firms with high global value chain participation responded to currency appreciation by reducing export prices more substantially than other firms, effectively absorbing exchange rate shocks to maintain market share (Jiang et al., 2024). This pricing strategy protects export volumes but reduces profitability, creating challenges for firms attempting to maintain profit margins amid volatile exchange rates.

The decision to pass through exchange rate changes into prices versus absorbing them through reduced markups depends on competitive conditions, product

differentiation, and firms' strategic objectives. Research on multinational firms found that pricing strategy varied substantially across different industries and competitive environments (Oteri et al., 2024). Firms in highly competitive industries with homogeneous products tend to experience limited pricing power and must accept lower margins when home currencies appreciate. Conversely, firms producing differentiated products or possessing significant market power can more easily pass through exchange rate changes into prices (Liu et al., 2024). Long-term strategic considerations also influence pricing decisions, as firms may temporarily accept reduced margins to maintain market share and competitive positioning, recognizing that building market presence requires time and investment that can be lost if pricing becomes uncompetitive during temporary currency appreciation episodes (Chen, 2024).

5.4 Investment and Production Location Decisions

Exchange rate volatility influences firms' decisions about where to locate production facilities and make capital investments. Currency depreciation in particular locations makes those regions attractive for foreign direct investment by reducing the cost of establishing production facilities relative to alternative locations (Lulu, 2025). However, exchange rate uncertainty discourages investment by increasing the perceived riskiness of committing substantial capital to particular locations (Agustina et al., 2025). Research examining the relationship between exchange rate volatility and foreign direct investment found that increased volatility typically reduced FDI inflows, particularly to developing economies where institutional frameworks for managing currency risk are less developed (Yusuf, 2026). This creates a challenging situation for developing

countries, as currency volatility that might improve export competitiveness through depreciation simultaneously reduces the inflows of capital and technology that contribute to productivity improvements and long-term growth.

The response of multinational enterprises to exchange rate movements also depends on whether volatility is perceived as temporary or permanent. Temporary exchange rate movements may not substantially influence long-term investment decisions, while sustained currency appreciation or depreciation can shift location choices and production strategies (Wang, 2025). Research examining firms' responses to the COVID-19 pandemic found that economic uncertainty and exchange rate volatility prompted firms to reconsider supply chain configurations and production locations, with some firms expanding nearshoring strategies to reduce exposure to distant, volatile currency relationships (Aleke & Alum, 2024). These longer-term structural responses to exchange rate volatility can have persistent effects on international trade patterns and the geographic distribution of economic activity, potentially creating winners and losers among different regions and countries (Liu et al., 2024).

6. Policy Implications and Conclusions

6.1 Exchange Rate Policy Options and Trade Balance Management

Policymakers face difficult choices regarding exchange rate management, particularly in developing and emerging market economies where exchange rate volatility creates substantial macroeconomic uncertainty. The traditional argument for floating exchange rates suggests that they allow automatic adjustment of trade balances through the price mechanism, with currency depreciation improving competitiveness and currency appreciation reducing it. However, the evidence

from numerous countries suggests that this adjustment mechanism operates imperfectly, particularly in the short run, and that substantial welfare losses can occur during periods of extreme volatility (Vasiliev et al., 2026). Alternative approaches include managed floating exchange rates that allow gradual adjustment while smoothing excessive volatility, exchange rate target zones that permit limited fluctuation within predetermined bands, or fixed exchange rate regimes that eliminate exchange rate uncertainty at the cost of surrendering monetary policy autonomy (Mikayelyan, 2025).

Research on developing economies found that managed float exchange rate regimes often outperformed both completely flexible regimes and fixed exchange rate arrangements in terms of promoting trade and macroeconomic stability (Umeokwobi, 2025). Tanzania's central bank interventions aimed at stabilizing the shilling demonstrated the potential benefits of active exchange rate management, particularly when combined with supportive monetary and fiscal policies (Lulu, 2025). However, managed exchange rate regimes also create risks of currency misalignment, where central bank interventions keep the exchange rate at unsustainable levels, ultimately forcing sharp adjustments when reserves are exhausted (Tiro & Chiwira, 2025). Furthermore, interventions by one country's central bank can create negative externalities for trading partners, motivating international policy coordination but also creating potential for conflict if countries pursue exchange rate objectives that are mutually incompatible (Wieloch et al., 2024).

6.2 Monetary and Fiscal Policy Coordination

Exchange rate volatility and trade balance outcomes are substantially influenced

by the broader macroeconomic policy environment, particularly the coordination between monetary and fiscal policies. Monetary policies that create domestic interest rate differentials between countries influence capital flows and exchange rates, often working at cross-purposes with trade policy objectives (Banik, 2025). For instance, monetary policy tightening designed to control inflation can cause currency appreciation that adversely affects export competitiveness, offsetting the gains from trade liberalization. Similarly, fiscal expansion that increases government spending tends to increase imports, potentially worsening trade balances even if the exchange rate remains stable or depreciates (Khouiled et al., 2023).

Effective trade policy therefore requires coordination between monetary and fiscal authorities to ensure that macroeconomic policies support rather than undermine trade balance objectives. Research on multiple countries found that countries whose monetary and fiscal policies were actively coordinated to support stable, competitive exchange rates while maintaining reasonable interest rates generally achieved more favorable trade balance outcomes compared to countries with inconsistent or conflicting policies (Agustina et al., 2025). Central bank transparency regarding monetary policy intentions also reduces exchange rate volatility by allowing private traders to accurately anticipate policy actions, thereby reducing unnecessary currency fluctuations that disrupt trade and investment (Hotsawadi et al., 2025). Furthermore, international coordination of monetary policies during periods of global economic crisis can reduce contagion effects and mitigate the sharp exchange rate movements that occurred during episodes such as the Asian financial crisis and the global financial crisis of 2008-

2009 (Oktafiani, 2023).

6.3 Trade Policy and Competitiveness Enhancement

While exchange rate management represents one policy tool for affecting trade balances, many researchers and policymakers increasingly recognize that sustainable improvements in trade performance depend on enhancing the underlying competitiveness of export-oriented industries. Trade policies should focus on supporting investments in productivity, technological innovation, quality improvements, and human capital development that enable firms to compete effectively at any given exchange rate level (Hotsawadi et al., 2025). Research on Nigeria's trade dynamics found that when domestic production capacity and export quality were constrained, currency depreciation failed to improve trade balance substantially, as the lack of competitive supply limited export expansion opportunities (Akighir, 2023). Conversely, countries that used exchange rate stability as an opportunity to build industrial capacity and enhance export quality experienced sustained improvements in trade performance even as exchange rates adjusted (Vasiliev et al., 2026).

Import substitution industrialization strategies can also contribute to trade balance improvements by reducing dependence on imports for domestically produced goods, though these must be carefully implemented to avoid creating inefficient protected industries that drain resources and reduce overall economic productivity (Yusuf, 2026). Export diversification away from commodity dependence represents another crucial long-term policy objective, as commodity-exporting countries remain vulnerable to volatile international commodity prices that often dominate exchange rate movements and trade balance outcomes (Kalsum et al.,

2025). Supporting firms' ability to manage currency risk through development of financial market infrastructure and education regarding hedging strategies can reduce the adverse effects of exchange rate volatility while permitting the beneficial adjustment mechanisms to operate (Pan, 2025). Finally, regional trade agreements that reduce transactions costs and create larger integrated markets can reduce firms' exchange rate exposure through diversification and reduce the importance of exchange rate fluctuations for trade flows (Vasiliev et al., 2026).

6.4 Synthesis and Future Research Directions

The comprehensive examination of exchange rate volatility and its effects on trade balance reveals a complex relationship that defies simple generalizations or universal policy prescriptions. Exchange rate movements do influence trade flows, typically in the directions predicted by theory, but the magnitude and speed of adjustment vary substantially across countries, sectors, and time periods. The Marshall-Lerner condition generally holds in the long run for most countries examined, supporting the theoretical prediction that currency depreciation eventually improves trade balance by making exports more competitive and reducing import demand. However, short-term J-curve effects frequently cause initial trade balance deterioration following depreciation, and these short-term disruptions can create substantial economic costs even if long-term effects prove beneficial (Ferreira & Januário, 2024).

Future research should continue developing more sophisticated understanding of how exchange rate volatility affects different dimensions of trade including goods versus services, trade with different geographic partners, and different firm types characterized by various levels of global value chain integration. The role of

financial market development and the availability of hedging instruments in mediating exchange rate effects on trade requires further investigation, particularly regarding how financial constraints facing small and medium-sized enterprises influence their adjustment to exchange rate shocks. Additionally, research examining how exchange rate volatility interacts with other sources of macroeconomic uncertainty, including policy uncertainty and commodity price volatility, can illuminate the combined effects of multiple sources of instability on international trade. Finally, investigating how firms' long-term strategic responses to exchange rate volatility, including supply chain restructuring and production relocation decisions, alter the nature of international trade patterns and competitiveness deserves increased scholarly attention (Khouiled et al., 2023).

In conclusion, exchange rate volatility remains a central feature of the modern global economy with substantial implications for trade flows, employment, and economic growth. Policymakers and business leaders must navigate the challenges created by currency fluctuations while recognizing both the adjustment mechanisms through which exchange rates correct trade imbalances and the adjustment costs incurred during periods of volatility. Effective policy responses require coordination across monetary, fiscal, and trade policy domains while recognizing that sustainable improvements in trade performance ultimately depend on enhancing underlying productive capacity and competitiveness rather than relying solely on exchange rate adjustments (Jaiswal & Soni, 2025).

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