Lahore Journal of Economics
Volume 29, Issue 1,
Spring 2024

Exchange Rate Policy and Trade Performance in Pakistan

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Citation: "Bukhari, S.K.H., Mahmood, A., and Khan, M. Ul, H., (2024). Exchange Rate Policy and Trade Performance in Pakistan". *Lahore Journal of Economics*, *29* (1), 47–68.
https://doi.org/10.35536/lje.2024.v29.i1.a3

Abstract: *The exchange rate is an important tool for enhancing exports in emerging economies. To quantify the role of the exchange rate in determining trade in Pakistan, this paper presents estimates of the elasticities of relative prices, demand, and exchange rates across various categories of export and import demand for Pakistan's economy. Our results indicate that the exports of manufactured and intermediate inputs are more responsive to changes in relative prices and exchange rates than the exports of primary goods. Furthermore, the higher magnitude of the elasticity of exports with respect to foreign demand suggests that Pakistan's exports are more responsive to foreign demand. Regarding import demand functions, our results show that the exchange rate plays an important role in impacting the demand for primary and manufactured goods imports, while domestic income drives the demand for intermediate goods imports. Overall, the exchange rate and foreign demand have played a significant role in enhancing exports in Pakistan.*

Keywords: Exports, imports, elasticities, exchange rate, relative prices, external demand, domestic demand, Pakistan.

JEL Classification: F11, F14, F17, F19.

Paper type: Research paper

Received: 28th March 2025 Revised: 5th May 2025 Accepted: 5th May 2025

Conflict of interest:
The authors declare no conflict of interest.

Funding:
There is no funding for this research.

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1. Introduction

The four theoretical approaches to analyzing the impact of devaluation on the economy's external sector present compelling arguments. Proponents of the trade/elasticities approach (Robinson, 1947 and Metzler, 1948) describe the necessary and sufficient conditions for improving the trade balance in terms of elasticities of demand and supply. They argue that devaluation should improve the trade balance if demand elasticities are sufficiently large and supply elasticities are sufficiently small. Advocates of the absorption approach (Alexander; 1952 and Johnson; 1967) explain how devaluation may change the terms of trade, increase production, shift expenditure from foreign to domestic goods, or have other effects that reduce domestic absorption relative to production, thereby improving the trade balance. International monetarists (Mundell, 1971, Dornbusch; 1973; Frenkel & Rodriguez, 1975) contend that exchange rate devaluations reduce the real value of cash balances and/or change the relative price of traded to non-traded goods, thus improving both the trade balance and the balance of payments. This understanding is referred to as the balance of payments approach. The exchange rate is also influenced by changes in monetary policy (Khan, 1999), known as the monetary approach, which postulates that the exchange rate is determined by the process of equilibrating the demand and supply of currency stocks.

The responsiveness of imports and exports to exchange rate movements is a critical area of study for understanding the effectiveness of exchange rate policies in adjusting the balance of payments. The seminal works of Robinson (1947) and Meade (1951) laid the foundation for analyzing the impact of exchange rate fluctuations on trade balances. Goldstein and Khan (1985) found that the exchange rate elasticities of exports and imports are higher in the long run than in the short run, primarily because agents gradually adjust to price changes. Furthermore, Hooper and Marquez (1995) highlight the presence of asymmetries in these responses. More recently, Ahmed et al. (2015) and Boz, Bussière, and Marsilli (2022) document a decline in exchange rate elasticities, attributing it to structural changes in global supply chains that have dampened the traditional impact of exchange rate movements on trade flows.

Trade is promoted as a necessary catalyst for fostering economic growth in developing countries (Singh, 2010). Over the past several

decades, policymakers have utilized foreign trade policies and exchange rates to influence trade flows, thereby impacting economic development levels. In the modern economic landscape, macroeconomic policies, particularly exchange rate policies, increasingly play a role in enhancing exports and providing neutral incentives to import-competing and export-oriented industries (Sekkat & Varoudakis, 2000; Arslan & Wijnbergen, 1993). However, these policies have undergone significant changes over time (Dollar, 1992; Sachs and Warner, 1995; Rodriguez and Rodrik, 2001; Rodrik, 2008). Countries worldwide, regardless of their development level, are now pursuing policies that integrate them into the growing global trade to reap the benefits from this unprecedented development in the international economic order (Choudhry, Marelli, and Signorelli, 2020; Huh and Park, 2021). Fukui, Nakamura, and Steinsson (2023) find that depreciation leads to a fall in net exports due to expenditure switching and highlight the importance of financial channels in achieving economic growth.

Therefore, the exchange rate strongly influences a country's trade, as demonstrated by the high correlation between the real exchange rate and exports (Freund & Pierola, 2008). Cooper (1971, 1971a), Connolly & Taylor (1972), Salant (1976), and Himarios (1989) find evidence supporting their contention that exchange rate devaluations generally lead to an improvement in the trade balance and can thus be considered beneficial for the economy. However, Magee (1973), Junz & Rhomberg (1973), Laffer (1976), Williamson (1983), and Bahmani-Oskooee (1985) show that, in general, exchange rate devaluation has an undesirable impact on the trade balance of countries. An overvaluation of the exchange rate leads to a rising trade deficit and falling reserves, which often prompt increased use of exchange controls and trade barriers, and vice versa. The overvaluation of the Vietnamese dong apparently contributed to the deterioration of the trade account (Phuc, 2019). The exchange rate has taken on a crucial role in influencing the trade deficit in the current scenario of falling tariff levels and reduced non-tariff barriers.

Bahmani-Oskooee (1994) examines the case of Australian exports and imports, concluding, "Australia's macroeconomic policies have indeed been effective in making exports and imports converge toward equilibrium in the long run." Paleologos and Georgantelis (1997) show a long-run relationship between the Greek trade balance and the real effective exchange rate of the Greek currency. In contrast to these studies that highlight the beneficial impact of devaluations on the trade balance, several studies suggest that devaluations may not have been so

advantageous. Husted (1992) examines the long-run relationship between US exports and imports and finds that the US violated its inter-temporal budget constraint. Upadhyaya et al. (1998) find that devaluation has a positive and significant effect on the trade balance in India and Nepal.

The increase in exports, in the absence of surplus stocks, requires an increase in production, which in turn requires capital and raw materials. Less developed or developing countries are typically agro-based, labor-abundant economies with insufficient capital. Thus, capital can only be imported from other countries to enhance production. Consequently, developing countries must engage in the trade of intermediate goods while also focusing on export promotion policies. Trade policy plays a vital role in shaping a country's trade landscape. With import substitution policies in place, there could be a decline in the level of imports. Conversely, if trade remains open, it could hinder exports, although exports might increase in the long run. A low level of imports may lead to a decline in exports due to stagnant capacity; similarly, a low level of exports may result in a decline in imports due to a shortage of foreign exchange. Therefore, it is essential to better understand the relationship between real exchange rates, exports, and imports.

Given that it is uncertain whether exchange rate devaluation actually helps improve the trade balance, numerous studies have analyzed the empirical evidence regarding the effects of devaluations on the trade balance across a wide variety of countries. Initially, these studies utilized import and export demand elasticities to infer how trade flows respond to changes in price or exchange rates, while more recent research constructed reduced-form models incorporating elements of all three approaches (exchange rate, income, and money supply).

Empirical research on Pakistan provides additional insights, particularly given the country's chronic trade deficit and frequent exchange rate adjustments. Kemal and Qadir (2005) find that the elasticity of export demand with respect to the exchange rate is relatively high, suggesting that currency depreciation could help increase exports. However, import demand is relatively inelastic due to dependence on essential goods such as energy, food, and capital goods. This implies that exchange rate depreciation may have a limited effect on improving the trade balance, especially for crucial imports like oil, machinery, and food products. Hyder and Mahboob (2006), using error correction models, conclude that exchange rate depreciation supports export growth in the long run but has limited effects in the short run. Rehman et al. (2012)

confirm that the Marshall-Lerner condition holds in the long run for Pakistan. Baluch and Hyder (2012) estimate the price and income elasticities of imports, determining long-run values of –0.53 for relative prices and 1.22 for income.

It is quite apparent that the long- and short-run relationships between exports, imports, and the exchange rate exist, but the exact nature of these relationships is still unclear. The literature on the subject suggests that the trade balance improves with devaluation in some cases, while quite the opposite holds true in others. It is expected that the current study will make a substantial contribution to the debate on this important issue by shedding light on the phenomenon in a small open economy like Pakistan.

Based on this discussion, our primary focus is to quantify the role of exchange rate movements on the exports and imports of Pakistan. In addition, we also compare the contribution of the exchange rate to export and import demand relative to that of income and relative prices. The results suggest that external demand (growth in GDP of trading partners) plays the most important role in determining Pakistan's export demand. Similarly, domestic demand emerges as the most significant contributor to import demand. Although the impacts of relative prices and exchange rates are less than those of income effects, they remain significant.

The organization of the paper is as follows: after the introduction in Section 1, Section 2 discusses the theoretical framework and methods, Section 3 discusses the results, and Section 4 concludes.

2. Theoretical Framework and Methodology

The objective of this paper is to examine the role of the exchange rate in determining the export and import demand of Pakistan. Given the heterogeneous nature of exports and imports, the determinants are explored at a disaggregated level. Our review of existing studies leads us to the external and domestic factors that influence Pakistan's exports and imports. External demand, the nominal effective exchange rate, the unit value of exports, price levels of trading partners, and sector-specific control variables are the main determinants of export demand.

The export demand function is specified as:

$$X_{i,t}^{d} = f\left(\frac{P_{i,t}^{x}}{P_{i,t}^{f}}, Y_{i,t}^{f}, ER_{i,t}^{N}, Z_{i,t}\right), \quad (1)$$

$X_{i,t}^{d}$ is the export demand of category i in time period t, $P_{i,t}^{x}$ is the unit value of respective export item, $P_{i,t}^{f}$ are the foreign consumer prices, Y_{t}^{f} is the external demand, ER_{t}^{N} is the nominal effective exchange rate, and $Z_{i,t}$ is a vector of sector specific control variables.

Domestic demand for foreign goods is specified as follows.

$$M_{i,t}^{d} = f\left(\frac{P_{i,t}^{m}}{P_{i,t}^{d}}, Y_{i,t}^{d}, ER_{i,t}^{N}, Z_{i,t}\right), \quad (2)$$

$M_{i,t}^{d}$ is the import demand of a specific category i, $P_{i,t}^{m}$ is the unit value of respective imports, $P_{i,t}^{d}$ are the domestic consumer prices, Y_{t}^{d} is the domestic demand, ER_{t}^{N} is the nominal effective exchange rate, and $Z_{i,t}$ is a vector of control variables.

To transform Equation (1) for estimation, the logarithmic functional form is imposed by adding the intercept and error term.

$$Ln(X_{i,t}^{d}) = \alpha_i + \beta_i * Ln\left(\frac{P_{i,t}^{x}}{P_{i,t}^{f}}\right) + \gamma_i * Ln\left(ER_{i,t}^{N}\right) + \delta_i * Ln\left(Y_{i,t}^{f}\right) + \zeta_i * Ln\left(Z_{i,t}\right) + \epsilon_i \quad (3)$$

Exports witness an increase due to increases in global demand, which implies that $\delta_i > 0$. An increase in relative prices reduces the demand for exports and hence the price effect implies that $\beta_i < 0$. An increase in the nominal effective exchange rate implies appreciation, so it is expected that it would result in a decline in exports ($\gamma_i < 0$). The wholesale prices in the domestic economy, agricultural productivity as well as dummy variables for export packages and energy shortages are introduced in the matrix of control variables.

Rewriting Equation (2) in logarithmic functional form and adding the intercept and error term provides the equation to be estimated.

$$Ln(M_{i,t}^{d}) = \alpha_i + \beta_i * Ln\left(\frac{P_{i,t}^{m}}{P_{i,t}^{d}}\right) + \gamma_i * Ln\left(ER_{i,t}^{N}\right) + \delta_i * Ln\left(Y_{i,t}^{d}\right) + \zeta_i * Ln\left(Z_{i,t}\right) + \epsilon_i \quad (4)$$

Improvements in domestic demand, reflected by increases in domestic GDP, result in an increase in the import demand, so it implies $\delta_i > 0$. An increase in the unit value of imports relative to domestic consumer prices reduces the import demand, implying that $\beta_i < 0$. An appreciation in the nominal effective exchange rate results in cheaper imports at given prices and hence increases the import demand ($\gamma_i > 0$). Openness and dummy variables for energy shortages are introduced in the matrix of control variables.

To enhance the specification of the export and import demand functions, we incorporate squared terms of the explanatory variables based on the flexible functional form of the transcendental logarithmic (Translog) model. Specifically, we include squared terms for the nominal effective exchange rate, relative prices, and income to capture potential nonlinear relationships. Additionally, we incorporate deterministic components such as seasonal dummy variables, a linear trend, and a trend-squared term into the model. The specification further includes lags of both the dependent and explanatory variables to account for dynamic effects. The statistical significance of each explanatory variable determines its retention in the final equation. Short-run elasticities with respect to the exchange rate are calculated by considering both the linear and squared terms of the exchange rate variable.

Export demand functions are estimated for eight important categories of exports, which include: (i) Beverages & Tobacco; (ii) Chemicals; (iii) Crude Materials inedible except fuel; (iv) Food & Live Animals; (v) Manufactured Goods; (vi) Minerals, Fuels and Lubricants; (vii) Other Miscellaneous Manufactured Goods; and (viii) Machinery & Transport Equipment. In addition, the overall export function is also estimated. Separate estimation is performed for each category due to the heterogeneity of the products.

Import demand functions are estimated for nine important categories of imports, which include: (i) Beverages & Tobacco; (ii) Chemicals; (iii) Crude Materials, inedible except fuel; (iv) Food & Live Animals; (v) Manufactured Goods; (vi) Minerals; (vii) Fuels and Lubricants; (viii) Other Miscellaneous Manufactured Goods; (ix) Machinery & Transport Equipment; and (x) Vegetable Oils & Fats. Additionally, the overall import function is estimated based on aggregated data. Separate estimations are performed for each category due to product heterogeneity.

We use quarterly data of a small open economy – Pakistan, from Q1:1984 to Q4:2023. It is confirmed that we use stationary variable in the estimation process. To test for unit roots in the variables, we utilize the Augmented Dickey-Fuller (ADF) test, Dickey-Fuller Test with GLS Detrending (DFGLS), Elliot, Rothenberg, and Stock Point Optimal (ERS-PO) Test, the Kwiatkowski, Phillips, Schmidt, and Shin (KPSS) Test, and the Phillips-Perron (PP) Test. Conventionally, the trend and intercept in log levels, as well as the intercept in differences, are included. Due to the possibility of seasonality in the quarterly data, we also apply seasonal unit root tests, including the Hylleberg, Engle, Granger, and Yoo (HEGY, 1990) test, the Smith and Taylor (1998) likelihood HEGY test, Canova and Hansen (CH, 1995), and Taylor (2005) HEGY variance ratio tests. The seasonal deterministic variables included in estimation are: "none" (no seasonal exogenous), "dum" (seasonal dummies), "const" (constant), and "trend" (constant and linear trend). Seasonal Deterministics include spectral intercepts. Finally, we apply the Breakpoint unit root test, including modified augmented Dickey-Fuller tests, which allow for levels and trends that differ across a single break date. This minimizes the Dickey-Fuller t-statistic with an intercept break, considering the minimum t, maximum t, maximum absolute t, along with Innovational Outlier Tests and Additive Outlier Tests. For optimal lag selection, if required by the test, we use SIC. After investigating the time series properties of the variables under consideration, we use stationary variables in the estimation process.

Considering heterogeneity and endogeneity in the estimation process is the main contribution of this paper. The export demand function for eight categories and the import demand functions for nine categories are estimated using the simple OLS method. However, the unit value of exports and the nominal effective exchange rate may lead to biased estimates of the parameters due to reverse causality. The unit value and quantity of exports are mutually determined within the demand-supply framework. Furthermore, with the depreciation of the exchange rate, importers in the trading partner economies negotiate regarding the nominal share in the profits of exporters. Additionally, the inflow of foreign exchange due to an increase in exports may result in the appreciation of the currency, leading to endogeneity bias in the estimations. The global oil prices and economic growth in trading partner economies are exogenous variables in the context of a small open economy.

Similarly, higher import demand has exerted pressure on Pakistan's foreign exchange reserves, potentially leading to the depreciation of the

Pakistani rupee against partner currencies. Additionally, domestic GDP and import demand share a causal relationship in the Keynesian identity. Moreover, the phenomenon of imported inflation might result in similar consequences for domestic consumer prices. To address the issue of endogeneity in the export and import demand functions, these functions are also estimated using Two Stage Least Squares (2SLS), Limited Information Maximum Likelihood (LIML), and Generalized Method of Moments (GMM). For exports, we consider external demand—GDP of trading partners—as excluded instruments, while global oil prices, world food prices, and world CPI are treated as exogenous included instrumental variables. Furthermore, the lags of the alleged endogenous variables are also included as instrumental variables.

Initially, the specified equations are estimated using Ordinary Least Squares (OLS). However, to address potential endogeneity among the explanatory variables, alternative estimation techniques—including Two-Stage Least Squares (2SLS), Limited Information Maximum Likelihood (LIML), and the Generalized Method of Moments (GMM)—are also employed. To ensure the robustness of the parameter estimates, models are re-estimated with each of these methods. The 2SLS technique produces reliable results when valid and strong instrumental variables are available, but it may yield biased estimates in the presence of weak instruments. LIML performs better in small samples and is less sensitive to weak instruments compared to 2SLS. Finally, GMM is more efficient in the presence of heteroscedasticity or when the model is over-identified.

The diagnostic procedure is a crucial component of the research paper, as it enhances the validity of the results. To address the issue of autocorrelated errors, the lag of the dependent variable is included in the estimations. Robust standard errors that correct for serial correlation are reported in the case of OLS, 2SLS, and GMM estimations. Additionally, to confirm the validity and relevance of instrumental variables in the case of 2SLS, we employ the Sargan J-statistic and Cragg-Donald F-statistic to examine issues of over-identification and weak identification when using LIML and GMM. We test for autocorrelation, autoregressive conditional heteroscedasticity (ARCH), and the normality of residuals.

3. Results

With the objective of quantifying the impact of external and domestic factors on the demand for exports and imports of Pakistan, we estimate the logarithmic transformed export and import demand functions at a

disaggregated level (Equations 3 and 4) using OLS, 2SLS, LIML, and GMM techniques. We discuss the overall results as well as various categories of exports and imports in this section. The nominal effective exchange rate, relative prices, and external demand are the key determinants of export demand for exports quantum. Although exchange rate and relative prices are significant determinants of export demand, growth in the trading partner's economies plays the most important role in enhancing the export demand for Pakistan. The instrumental variables are the log levels of external demand and world prices of exports, while the excluded instrumental variables are the lags of external demand, world prices of exports, domestic consumer and wholesale prices, domestic production, nominal effective exchange rate, and unit value of exports. Identification issues in the estimations are investigated by examining the relevance of the instrumental variables. The Cragg-Donald F-statistic confirms the relevance of the instruments. We test the validity of the instruments using the Sargan J-test, which confirms that there is no issue of overidentification in the models. We employ the LM test and Ljung-Box Q for checking the autocorrelation structure of the residuals, Ljung-Box Q-squared statistics for testing ARCH, and the Jarque-Bera statistic for the normality of the residuals. The diagnostic procedure confirms that the residuals are well behaved and that the instrumental variables are valid and relevant. Table 1 presents the estimates of the elasticities of relative prices, nominal effective exchange rate, and external demand with respect to the quantum of exports. Table 2 presents the estimates of the elasticities of relative prices, nominal effective exchange rate, and domestic demand with respect to the quantum of imports. The estimates for the analysis of disaggregated export and import elasticities are reported in Tables A2-A7 in the appendix. Table A1 discusses the model diagnostics for GMM.

Table 1 reports the results of the demand function for overall exports as well as disaggregated exports. The results of the GMM model indicate that a 10 percent increase in the unit value of exports relative to world export prices causes a decrease of 2.3 percent in export quantum. In comparison, these estimates from the 2SLS and OLS models are 2.9 and 5.5 percent, indicating relatively higher responsiveness of relative prices after considering endogeneity. Regarding the impact of the nominal effective exchange rate, a 10 percent appreciation reduces the quantum of exports by 2.2, 1.8, and 2.8 percent in the GMM, 2SLS, and OLS models, respectively. The expansion of the trading partners' economies has a strong impact on the export demand of Pakistan. Overall export quantum increases by 7.7 percent in response to a growth of 10 percent in the trading partner economies.

Table 1: Elasticity estimates of Export demand functions by sectors

Sectors	Relative Prices	NEER	External demand
Beverages & Tobacco	-6.90**	-2.43*	4.38**
Chemicals	-0.25	-0.93	0.22
Crude Material inedible except fuel	-0.15	0.15	-3.56
Food & Live Animals	-0.14**	-0.35**	0.89**
Manufactured good	-0.14*	-0.63**	1.04**
Minerals, Fuel and Lubricants	-0.38	-	0.56
Misc. Manufactured good	-0.06	-0.36	0.37
Machinery & transport	-23.48**	41.20	-340.71*
Overall	-0.16*	-0.67**	2.97**

Source: Authors' calculations.

Table 2 presents the estimates of overall and disaggregated import demand functions. The expansion of the domestic economy plays an important role in increasing the demand for imports. However, the elasticity of imports with respect to domestic demand is low. We consider the industrial production index of large-scale manufacturing as an indicator of domestic demand. An increase of 10 percent in domestic demand causes an increase of 5.3 percent in the demand for imports. Imports are less elastic to the exchange rate and relative prices. Imports of beverages and tobacco, as well as manufactured goods, are highly elastic to changes in relative prices, whereas machinery and transport are relatively inelastic to price changes. All types of manufactured goods and transport and machinery groups are responsive to movements in exchange rates, whereas consumer goods (food and beverages, food and live animals, and vegetable oil and animal fats) are inelastic to movements in exchange rates.

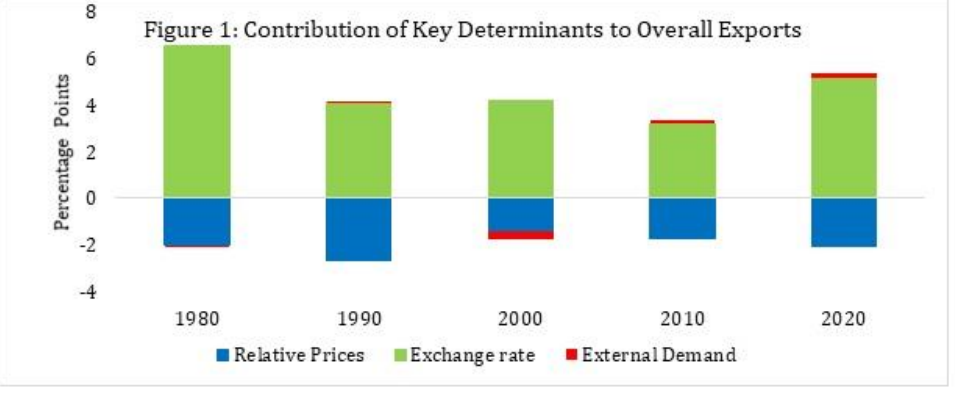
Table 2: Elasticity estimates of Import demand functions by sectors

Groups	Relative Prices	NEER	Domestic demand
Beverages & Tobacco	-0.73**	3.91**	1.45**
Chemicals	-0.69**	0.63*	
Crude Material inedible except fuel	-0.55*		0.95**
Food & Live Animals	-0.60**		0.60**
Manufactured good	-0.70**	0.46*	0.20***
Minerals, Fuel and Lubricants	-0.07**		0.03
Misc. Manufactured good	-0.23*	0.96**	0.71**
Machinery & transport	-0.15*	1.14**	1.27**
Vegetable, oil and Fats	-0.49**	0.77*	0.99**
Overall	-0.56*	3.81*	7.83**

Source: Authors' calculations.

The estimates of the elasticities for both aggregate and sector-wise export and import demand functions are presented in Tables 1 and 2, respectively. Figures 1 and 2 illustrate the historical contributions of relative prices, the nominal effective exchange rate, and demand—measured by domestic GDP in the case of imports and foreign GDP in the case of exports. These historical contributions are computed using real-time data for all relevant variables. We compute the contribution of key determinants on exports by utilizing the estimates of the GMM model (Figure 1). In enhancing export demand from 1990 to 2015, the exchange rate and external demand are favorable factors, while relative prices and other factors (technology, inertia, base effect, markup, and dummy variables) are unfavorable factors. The exchange rate has bolstered export demand throughout the sample. Disaggregated export demand functions reveal that the responsiveness of export quantities of intermediate goods (chemicals, crude materials, machinery, and transport) is high to all determinants, whereas the export of final goods is relatively less elastic.

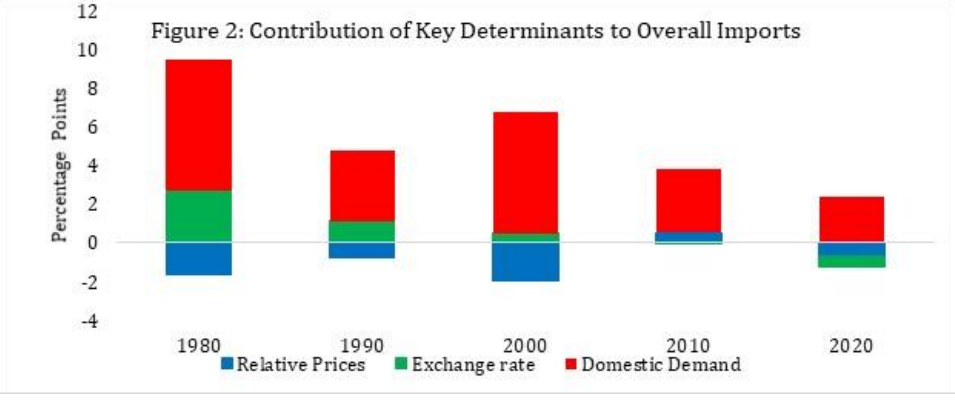
Figure 1: Contribution of Key Determinants to Overall Exports



Source: Authors' calculations.

Figure 2 illustrates the contributions of relative prices, the exchange rate, domestic demand, and other factors (technology, inertia, dummy variables, markup, international oil prices) in explaining the growth trajectory of import demand. The depreciation of the exchange rate constrained import demand during FY91-15. Declining relative prices, increasing LSM growth, and other factors have enhanced import demand during FY16 and FY17.

Figure 2: Contribution of Key Determinants to Overall Imports



Source: Authors' calculations.

4. Conclusions

The objective of this paper is to examine the role of the exchange rate in determining the exports and imports of Pakistan's economy. The nominal effective exchange rate, relative prices, income of trading partners, and control variables are the determinants of overall as well as disaggregated exports. Similarly, imports are affected by domestic demand, the nominal effective exchange rate, relative prices, and control variables. To address the issues of endogeneity and heterogeneity, we estimate the demand functions for exports and imports using OLS, 2SLS, and GMM. Diagnostics confirm the validity and relevance of the instrumental variables.

Further, tests reject the presence of ARCH, autocorrelation, and non-normality in the residuals. The results of the aggregate export and import demand functions indicate that exports and imports are less elastic to changes in relative prices, exchange rates, and demand. We find that the exports and imports of intermediate inputs are more responsive to changes in relative prices and exchange rates compared to the exports and imports of manufactured and primary goods. A higher magnitude of elasticity of exports with respect to foreign income indicates that Pakistan's exports are primarily driven by external demand. Domestic economic growth drives the demand for intermediate goods imports.

References

Alessandria, G. A., Khan, S. Y., Khederlarian, A., Ruhl, K. J., & Steinberg, J. B. (2025). *Recovering credible trade elasticities from incredible trade reforms* (No. w33568). National Bureau of Economic Research.

Arslan, I., & Van Wijnbergen, S. (1993). Export Incentives, Exchange Rate Policy and Export Growth in Turkey. *The Review of Economics and Statistics, 75*(1), 128-133. doi:10.2307/2109635

Bahmani-Oskooee, M. (1998). Cointegration approach to estimate the long-run trade elasticities in LDCs. *International Economic Journal*, *12*(3), 89-96.

Broda, C., & Weinstein, D. E. (2006). *Globalization and the gains from variety The Quarterly Journal of Economics, 121*(2), 541–585.

Çağlayan Aslan, Oğuzhan Çepni & Selçuk Gül (2021). The impact of real exchange rate on international trade: Evidence from panel structural VAR model, The Journal of International Trade & Economic Development, 30:6, 829-842, DOI: 10.1080/09638199.2021.1905695

Chaudhry, A and Hyder, K., (2013). A structural VAR analysis of the impact of macroeconomic shocks on Pakistan's textile exports, *Economic Modelling*, 32(2), 302-315.

Choudhry, M.T., Marelli, E. and Signorelli, M., 2020. Global integration and economic growth in emerging countries: The case of BRICS and NEXT-11. In Capitalism, Global Change and Sustainable Development (pp. 25-55). Springer, Cham.

Devarajan, S., Go, D. S., & Robinson, S. (2023). *Trade Elasticities in Aggregate Models: Estimates for 191 Countries* (No. 10490). The World Bank.

Devereux, M. B., Dong, W., & Tomlin, B. (2025). Trade flows and exchange rates: Importers, exporters and products. *Journal of International Economics*, *154*, 104044.

Feenstra, R. C., Obstfeld, M., & Taylor, A. M. (2018). *International Economics* (4th ed.). Macmillan.

Gala, Paulo. 2007. "Real Exchange Rate Levels and Economic Development: Theoretical Analysis and Econometric Evidence." Cambridge Journal of Economics 32, no. 2: 273–88.

Galvarriato, Aurora Gómez, and Jeffrey G. Williamson. 2008. "Was It Prices, Productivity or Policy? The Timing and Pace of Latin American Industrialization after 1870." NBER Working Paper 13990. Cambridge, Mass.: National Bureau of Economic Research (May).

Gluzmann, Pablo, Eduardo Levy-Yeyati, and Federico Sturzenegger. 2007. "Exchange Rate Undervaluation and Economic Growth: Díaz Alejandro (1965) Revisited." Kennedy School of Government, Harvard University. Hausmann,

Goldstein, M., & Khan, M. S. (1985). *Income and Price Effects in Foreign Trade*. Handbook of International Economics.

Hahn, J., & Hausman, J. (2003). Weak instruments: Diagnosis and cures in empirical econometrics. American Economic Review, 93(2), 118–125.

Hausmann, Ricardo, and Dani Rodrik. 2003. "Economic Development as SelfDiscovery." Journal of Development Economics 72, no. 2 (December): 603–33.

Hausmann, Ricardo, Jason Hwang, and Dani Rodrik. 2007. "What You Export Matters." Journal of Economic Growth 12, no. 1: 1–25.

Hausmann, Ricardo, Lant Pritchett, and Dani Rodrik. 2005. "Growth Accelerations." Journal of Economic Growth 10, no. 4: 303–29.

Hayashi, F. (2000). *Econometrics*. Princeton University Press.

Heston, Alan, Robert Summers, and Bettina Aten. 2006. "Penn World Table Version 6.2." Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania (September). pwt.econ.upenn.edu/ php_site/pwt_index.php.

Houthakker, H. S., & Magee, S. P. (1969). *Income and Price Elasticities in World Trade*. *The Review of Economics and Statistics*, 51(2), 111–125.

Huh, H.S. and Park, C.Y., 2021. A new index of globalisation: Measuring impacts of integration on economic growth and income inequality. The World Economy, 44(2), pp.409-443.Ilzetzki, Ethan O., Carmen M. Reinhart, and Kenneth Rogoff. 2008. "Exchange Rate Arrangements Entering the 21st Century: Which Anchor Will Hold?" University of Maryland and Harvard University.

Imbs, Jean, and Romain Wacziarg. 2003. "Stages of Diversification." American Economic Review 93, no. 1 (March): 63–86. International Comparison Program. 2007. "2005 International Comparison Program Preliminary Results." World Bank, Washington (December 17).

Johnson, Simon, Jonathan Ostry, and Arvind Subramanian. 2007. "The Prospects for Sustained Growth in Africa: Benchmarking the Constraints." IMF Working Paper 07/52. Washington: International Monetary Fund (March).

Kaufmann, Daniel, Aart Kraay, and Massimo Mastruzzi. 2008. "Governance Matters VII: Aggregate and Individual Governance Indicators, 1996–2007." World Bank Policy Research Working Paper 4654. Washington: World Bank (June 24).

Khurram, A. B., & Bukhari, S. K. H. (2012). Price and Income Elasticity of Imports, The case of Pakistan, State Bank of Pakistan (SBP) (No. 48). Working Paper Series.

Krugman, P. R., Obstfeld, M., & Melitz, M. J. (2018). *International Economics: Theory and Policy* (11th ed.). Pearson.

Levchenko, Andrei. 2004. "Institutional Quality and International Trade." IMF Working Paper 04/231. Washington: International Monetary Fund.

———. 2003. Turkey: Making the Productivity and Growth Breakthrough. Istanbul: McKinsey & Co.

Levy-Yeyati, Eduardo, and Federico Sturzenegger. 2007. "Fear of Floating in Reverse: Exchange Rate Policy in the 2000s." World Bank, Harvard University, and Universidad Torcuato di Tella. McKinsey Global Institute. 2001. India: The Growth Imperative. San Francisco: McKinsey & Co. DANI RODRIK 411 11472-07_Rodrik_rev2.qxd 3/6/09 1:20 PM Page 411

Li, N., & Meleshchuk, S. (2024). *Bilateral Trade in Services and Exchange Rates: Evidence of Dominant Currency Pricing. IMF Working Paper No. 24/242.*

Méon, Pierre-Guillaume, and Khalid Sekkat. 2006. "Institutional Quality and Trade: Which Institutions? Which Trade?" Working Paper DULBEA 06-06.RS. Brussels: Université Libre de Bruxelles, Department of Applied Economics. North, Douglass C. 1990. Institutions, Institutional Change and Economic Performance. Cambridge University Press.

Nakano, S., & Nishimura, K. (2024). *How do we measure trade elasticity for services? Empirical Economics, 66(1), 45–68.*

Nunn, Nathan. 2007. "Relationship-Specificity, Incomplete Contracts and the Pattern of Trade." Quarterly Journal of Economics 122, no. 2 (May): 569–600.

Phuc, N.T., 2019. Equilibrium Real Exchange Rate, Currency Misalignment, and Trade Performance-The Case of Vietnam: 1992-2017. International Journal of Asian Social Science, 9(12), pp.735-751.

Prasad, Eswar, Raghuram G. Rajan, and Arvind Subramanian. 2007. "Foreign Capital and Economic Growth." BPEA, no. 1: 153–209.

Rajan, Raghuram G., and Arvind Subramanian. 2006. "Aid, Dutch Disease, and Manufacturing Growth." Peterson Institute for International Economics, Washington (August).

Ranjan, Priya, and Jae Young Lee. 2004. "Contract Enforcement and the Volume of International Trade in Different Types of Goods." University of California, Irvine.

Rauch, James E. 1999. "Networks versus Markets in International Trade." Journal of International Economics 48, no. 1: 7–35.

Razin, Ofair, and Susan M. Collins. 1997. "Real Exchange Rate Misalignments and Growth." Georgetown University.

Ricardo. 2006. "Economic Growth: Shared Beliefs, Shared Disappointments?" Speech at the G-20 Seminar on Economic Growth in Pretoria, South Africa, August 2005. CID Working Paper 125. Center for International Development, Harvard University (June).

Rigobon, Roberto, and Dani Rodrik. 2005. "Rule of Law, Democracy, Openness and Income: Estimating the Interrelationships." Economics of Transition 13, no. 3 (July): 533–64.

Rodriguez, Francisco, and Dani Rodrik. 2001. "Trade Policy and Economic Growth: A Skeptic's Guide to the Cross-National Evidence." NBER Macroeconomics Annual 2000 15:261–325.

Rodrik, D. (2008). The real exchange rate and economic growth. Brookings papers on economic activity, 2008(2), 365-412.

———. 2005. "Why We Learn Nothing from Regressing Economic Growth on Policies." Kennedy School of Government, Harvard University (March). ksghome.harvard.edu/~drodrik/policy%20regressions.pdf.

Rodrik, Dani, and Arvind Subramanian. Forthcoming. "Why Did Financial Globalization Disappoint?" International Monetary Fund Staff Papers.

Rodrik, Dani, Arvind Subramanian, and Francesco Trebbi. 2004. "Institutions Rule: The Primacy of Institutions over Geography and Integration in Economic Development." Journal of Economic Growth 9, no. 2 (June): 131–65.

Rodrik, Dani. 1986. "'Disequilibrium' Exchange Rates as Industrialization Policy." Journal of Development Economics 23, no. 1 (September): 89–106.

Roodman, David. 2005. "xtabond2: Stata Module to Extend Xtabond Dynamic Panel Data Estimator." Center for Global Development, Washington. Econ papers.repec.org/software/bocbocode/s435901.htm.

———. 2006. "How to Do xtabond2: An Introduction to 'Difference' and 'System' Gmm in Stata." Working Paper 103. Center for Global Development, Washington (December).

Sachs, Jeffrey, and Andrew Warner. 1995. "Economic Reform and the Process of Global Integration." BPEA, no. 1: 1–95.

Ahmed, S. Ara, I. and Hyder, Kalim (2006). How External Shocks And Exchange Rate Depreciations Affect Pakistan? Implications for choice of an Exchange Rate Regime, ***SBP-Research Bulletin***, 2(1), 661-88.

Sekkat, K., & Varoudakis, A. (2000). Exchange rate management and manufactured exports in Sub-Saharan Africa. Journal of Development Economics, 61(1), 237-253.

Singh, T. (2010). Does international trade cause economic growth? A survey. The World Economy, 33(11), 1517-1564.

Stock, J. H., & Watson, M. W. (2020). *Introduction to Econometrics* (4th ed.). Pearson.

Thanh, N. N., & Kalirajan, K. (2005). The importance of exchange rate policy in promoting Vietnam's exports. Oxford Development Studies, 33(3-4), 511-529.

Wooldridge, J. M. (2010). Econometric Analysis of Cross Section and Panel Data. MIT Press.

5. Appendix

Table A1: Weak and under identification Tests of GMM Estimations

Dependent Variables	Alleged endogenous Variable	Difference in J-stats		J-stat
		Value	Probability	
Real Imports of Beverages & Tobacco	All	3.61	(0.5)	4.65
	Relative Prices	0.20	(0.7)	
	Domestic demand	2.47	(0.3)	
	NEER	2.20	(0.3)	
Real Imports of Chemicals	All	11.64	(0.0)	2.26
	Relative Prices	0.01	(0.9)	
	NEER	9.72	(0.0)	
Real Imports of Crude Material inedible except fuel	All	2.98	(0.2)	6.77
	Relative Prices	1.06	(0.3)	
	Domestic demand	2.79	(0.1)	
Real Imports of Food & Live Animals	All	4.52	(0.1)	1.50
	Relative Prices	3.80	(0.1)	
	Domestic demand	1.99	(0.2)	
Real Imports of Manufactured good	All	3.04	(0.6)	13.21
	Relative Prices	0.47	(0.5)	
	Domestic demand	1.00	(0.3)	
	NEER	1.95	(0.2)	
Real Imports of Minerals, Fuel and Lubricants	All	5.42	(0.1)	2.12
	Relative Prices	3.43	(0.1)	
	Domestic demand	4.27	(0.0)	
Real Imports of Misc. Manufactured good	All	0.74	(0.9)	12.01
	Relative Prices	0.08	(0.8)	
	Domestic demand	0.01	(0.9)	
	NEER	0.72	(0.4)	
Real Imports of Machinery & transport	All	4.95	(0.2)	6.55
	Relative Prices	3.71	(0.1)	
	Domestic demand	1.08	(0.3)	
	NEER	0.00	(1.0)	
Real Imports **Overall**	All	5.88	(0.2)	18.62
	Relative Prices	2.49	(0.1)	
	Domestic demand	2.05	(0.2)	
	NEER	1.99	(0.4)	
Real Imports of Vegetables, oil and Fats	All	6.51	(0.4)	4.22
	Relative Prices	4.84	(0.1)	
	Domestic demand	4.61	(0.1)	
	NEER	0.22	(0.9)	
Real Exports of Beverages & Tobacco	All	0.99	(0.6)	2.05
	NEER	0.99	(0.6)	
Real Exports of Chemicals	All	1.27	(0.7)	
	Relative Prices	0.00	(1.0)	
	NEER	1.23	(0.3)	
Real Exports of Crude Material inedible except fuel	All	1.97	(0.4)	0.00
	Relative Prices	0.75	(0.4)	
	NEER	1.92	(0.2)	

Dependent Variables	Alleged endogenous Variable	Difference in J-stats		J-stat
		Value	Probability	
Real Exports of Food & Live Animals	All	0.84	(0.7)	2.77
	Relative Prices	0.59	(0.4)	
	NEER	0.01	(0.9)	
Real Exports of Manufactured good	All	1.52	(0.7)	6.36
	Relative Prices	0.11	(0.7)	
	NEER	1.34	(0.2)	
Real Exports of Minerals, Fuel and Lubricants	All	5.43	(0.1)	5.77
	Relative Prices	2.34	(0.1)	
	NEER	0.36	(0.5)	
Real Exports of Misc. Manufactured good	All	3.32	(0.3)	4.92
	Relative Prices	0.53	(0.5)	
	NEER	0.01	(0.9)	
Real Exports of Machinery & transport	All	3.24	(0.7)	35.94
	Relative Prices	2.70	(0.3)	
	NEER	0.76	(0.7)	
Real Overall Exports	All	0.80	(0.7)	3.97
	Relative Prices	0.17	(0.7)	
	NEER	0.73	(0.4)	

Source: Authors' calculations.

Table A2: Estimation Results of Real Exports

Dep. Variable:	Real Exports of Beverages & Tobacco				Real Exports of Chemicals				Real Exports of Crude Material inedible except fuel			
Method:	**GMM**	**LIML**	**LS**	**TSLS**	**GMM**	**LIML**	**LS**	**TSLS**	**GMM**	**LIML**	**LS**	**TSLS**
Constant	-26.03	-20.46	14.92	-20.43	4.17	4.17	4.21	4.17	14.55	21.79	23.42	21.77
	[-2.3]*	[-1.6]	[1.6]	[-1.8]	[0.8]	[0.9]	[0.9]	[0.9]	[1.3]	[2.2]*	[2.1]*	[2.2]*
Relative Prices	-6.90	-6.71	-3.34	-6.69	-0.25	-0.25	-0.29	-0.25	-0.15	-0.11	-0.05	-0.10
	[-4.4]**	[-4.0]**	[-4.6]**	[-4.3]**	[-1.4]	[-1.4]	[-2.5]*	[-1.4]	[-0.5]	[-0.4]	[-0.2]	[-0.4]
(Relative Prices)^2	-0.93	-0.90	-0.42	-0.90								
	[-4.5]**	[-4.0]**	[-4.6]**	[-4.3]**								
NEER	-2.43	-3.02	-12.11	-2.79	-0.93	-0.93	-0.67	-0.93	0.15	-0.08	-1.11	-0.09
	[-2.1]*	[-1.5]	[-4.8]**	[-2.0]	[-2.0]	[-2.1]*	[-1.9]	[-2.1]*	[0.3]	[-0.1]	[-1.3]	[-0.1]
(NEER)^2	0.33	0.37	0.62	0.34								
	[2.7]**	[1.8]	[3.1]**	[2.3]*								
External demand	4.38	3.65	5.27	3.54	0.22	0.22	-0.20	0.22	-3.56	-5.02	-3.74	-4.99
	[2.6]**	[-2.0]	[2.9]**	[2.1]*	[0.1]	[0.2]	[-0.2]	[0.2]	[-1.2]	[-1.8]	[-1.3]	[-1.8]
Lagged Dependent variable	0.42	0.41	0.30	0.42	0.57	0.57	0.58	0.57	0.59	0.57	0.48	0.57
	[4.1]**	[5.8]**	[4.0]**	[3.6]**	[6.4]**	[6.6]**	[7.9]**	[6.6]**	[6.4]**	[6.8]**	[5.8]**	[6.8]**
Observations	155	155	155	155	155	155	155	155	155	155	155	155
R^2	0.51	0.51	0.53	0.52	0.88	0.88	0.88	0.88	0.63	0.63	0.64	0.63
Q_1	1.03	0.08	0.14	0.96	0.08	0.08	0.18	0.08	0.01	0.02	0.55	0.02
	(0.3)	(0.8)	(0.7)	(0.3)	(0.8)	(0.8)	(0.7)	(0.8)	(0.9)	(0.9)	(0.5)	(0.9)
Q_1^2	7.91	7.04	12.53	6.30	0.09	0.09	0.03	0.09	0.16	0.48	0.59	0.48
	(0.0)	(0.0)	0.0	(0.0)	(0.8)	(0.8)	(0.9)	(0.8)	(0.7)	(0.5)	(0.4)	(0.5)
J-B	4.02	0.26	9.47	4.35	0.26	0.26	0.17	0.26	2.74	1.87	2.84	1.85
	(0.1)	(0.9)	(0.0)	(0.1)	(0.9)	(0.9)	(0.9)	(0.9)	(0.3)	(0.4)	(0.2)	(0.4)
D-W	2.16	2.05	2.05	2.15	2.05	2.05	2.07	2.05	1.95	1.94	1.86	1.94
CD	216.4	216.4			28.5	28.5		28.5	51.7	51.7		51.7

Source: Authors' calculations.

Table A3: Estimation Results of Real Exports

Dep. Variable:	Real Exports of Food & Live Animals				Real Exports of Manufactured good				Real Exports of Minerals, Fuel and Lubricants			
Method:	**GMM**	**LIML**	**LS**	**TSLS**	**GMM**	**LIML**	**LS**	**TSLS**	**GMM**	**LIML**	**LS**	**TSLS**
Constant	-0.10	-0.11	0.74	0.08	1.44	-0.03	-0.53	-0.07	-0.21	-7.82	-7.63	-2.93
	[-0.1]	[-0.1]	[0.4]	[0.1]	[1.3]	[-0.0]	[-0.4]	[-0.1]	[-0.0]	[-1.2]	[-3.1]**	[-1.6]
Relative Prices	-0.14	-0.15	-0.14	-0.13	-0.14	-0.14	-0.14	-0.14	-0.38	-0.33	-0.69	-0.19
	[-3.4]**	[-2.3]*	[-2.4]*	[-2.1]*	[-2.6]*	[-1.9]	[-2.1]*	[-2.0]	[-1.2]	[-1.8]	[-3.0]**	[-3.3]**
NEER	-0.35	-0.38	-0.40	-0.36	-0.63	-0.59	-0.51	-0.58				
	[-3.0]**	[-3.0]**	[-3.2]**	[-2.7]**	[-4.0]**	[-3.0]**	[-2.9]**	[-2.9]**				
External demand	0.89	0.93	0.74	0.85	1.04	1.34	1.35	1.33	0.56	0.79		
	[2.9]**	[2.8]**	[2.4]*	[2.6]*	[3.6]**	[4.0]**	[4.0]**	[4.0]**	[0.4]	[0.8]		
Lag of Dependent variable	0.29	0.26	0.30	0.29	0.25	0.26	0.27	0.26	0.18	0.13	0.15	0.14
	[6.4]**	[3.8]**	[3.4]**	[3.4]**	[4.2]**	[3.1]**	[3.2]**	[3.1]**	[2.3]*	[2.6]*	[2.2]*	[2.5]*
Observations:	155	155	155	155	155	155	155	155	155	155	155	155
R-squared:	0.63	0.63	0.64	0.63	0.88	0.88	0.89	0.89	0.82	0.83	0.83	0.83
Q_1	0.00	0.03	0.00	0.04	0.21	0.11	0.04	0.10	0.03	0.01	0.43	0.01
	(0.9)	(0.8)	(0.9)	(0.8)	(0.6)	(0.7)	(0.8)	(0.7)	(0.8)	(0.9)	(0.5)	(0.9)
Q_1^2	1.84	2.69	4.11	4.78	0.01	0.14	0.18	0.14	0.35	0.30	0.16	0.59
	(0.2)	(0.1)	(0.0)	(0.0)	(0.9)	(0.7)	(0.7)	(0.7)	(0.6)	(0.6)	(0.7)	(0.4)
J-B	5.09	4.91	3.37	2.99	244.42	201.40	170.08	198.76	2.03	4.02	3.73	3.58
	(0.1)	(0.1)	(0.2)	(0.2)	(0.0)	(0.0)	(0.0)	(0.0)	(0.4)	(0.1)	(0.1)	(0.2)
D-W	2.00	1.96	1.96	1.96	1.86	1.91	1.92	1.91	1.95	2.02	2.12	2.02
CD test	46.7	46.7		63.5	65.9	65.9		65.9	19.3	18.7		19.0

Source: Authors' calculations.

Table A4: Estimation Results of Real Exports

Dep. Variable:	Real Exports of Misc. Manufactured good				Real Exports of Machinery & transport				Real Overall Exports			
Method:	**GMM**	**LIML**	**LS**	**TSLS**	**GMM**	**LIML**	**LS**	**TSLS**	**GMM**	**LIML**	**LS**	**TSLS**
Constant	1.37	2.55	0.77	1.41	631.90	51.59	12.95	33.38	5.44	5.53	5.80	5.54
	(0.7)	(1.6)	(0.4)	(0.7)	[2.3]*	[2.2]*	[1.8]	[2.3]*	[10.4]**	[7.1]**	[8.0]**	[7.4]**
Relative Prices	-0.06	-0.02	-0.26	-0.07	-23.48	-17.29	-0.68	-8.91	-0.16	-0.22	-0.17	-0.21
	[-0.5]	[-0.2]	[-2.1]*	[-0.6]	[-2.7]**	[-2.5]*	[-1.1]	[-2.2]*	[-2.4]*	[-2.8]**	[-2.4]*	[-2.7]**
(Relative Prices)^2			-2.45		-1.73		-0.12		-0.94			
			[-2.8]**		[-2.7]**		[-2.0]*		[-2.4]*			
NEER	-0.36	-0.28	-0.83	-0.36	41.20	-39.86	-8.20	-24.80	-0.67	-0.78	-0.75	-0.76
	[-1.4]	[-1.4]	[-2.7]**	[-1.4]	[1.8]	[-3.1]**	[-4.3]**	[-3.1]**	[-4.8]**	[-4.3]**	[-4.5]**	[-4.4]**
(NEER)^2			-4.49		0.81		0.65		0.83			
			[-1.8]		[1.7]		[3.9]**		[2.8]**			
External demand	0.37	-0.08	0.81	0.36	-340.71	16.51	2.80	9.88	2.97	3.54	1.97	3.66
	[1.2]	[-0.3]	[2.5]*	[1.1]	[-2.3]*	[2.6]*	[1.9]	[2.5]*	[2.7]**	[2.2]*	[0.9]	[2.2]*
Lag of Dependent variable	0.65	0.81	0.62	0.66	0.29	0.19	0.37	0.25	0.35	0.37	0.33	0.36
	[9.3]**	[13.7]**	[8.6]**	[9.4]**	[2.4]*	[0.9]	[5.0]**	[2.0]	[6.7]**	[4.6]**	[4.4]**	[4.5]**
Observations:	155	155	155	155	155	155	155	155	155	155	155	155
R-squared:	0.82	0.84	0.85	0.84	0.87	0.87	0.88	0.87	0.66	0.25	0.88	0.72
Q_1	0.45	0.66	0.79	0.54	0.60	0.90	1.68	0.40	0.01	0.09	0.63	0.05
	(0.5)	(0.4)	(0.4)	(0.5)	(0.4)	(0.3)	(0.2)	(0.8)	(0.9)	(0.8)	(0.4)	(0.8)
Q_1^2	2.03	2.03	0.82	2.22	2.50	57.39	0.13	3.91	0.41	0.37	0.01	0.38
	(0.2)	(0.2)	(0.4)	(0.1)	(0.1)	0.0	(0.7)	(0.0)	(0.5)	(0.5)	(0.9)	(0.5)
J-B	154.88	139.2	226.63	151.3	8.51	1.57	15.30	1.19	219.86	189.88	135.58	181.36
	(0.0)	0	(0.0)	3	(0.0)	(0.5)	(0.0)	(0.6)	(0.0)	(0.0)	(0.0)	(0.0)
		(0.0)		(0.0)								
D-W	2.08	2.11	2.13	2.09	1.63	0.44	2.20	0.97	2.01	2.05	2.10	2.03
CD	29.5	29.5		29.5	0.9	0.9		0.9	23.5	22.7		29.3

Source: Authors' calculations.

Table A5: Estimation Results of Real Imports

	Real Imports of Beverages & Tobacco				Real Imports of Chemicals				Real Imports of Crude Material inedible except fuel			
Method:	**GMM**	**LIML**	**LS**	**TSLS**	**GMM**	**LIML**	**LS**	**TSLS**	**GMM**	**LIML**	**LS**	**TSLS**
Constant	-14.18	-15.87	-12.64	-14.34	-0.20	-0.25	0.28	-1.32	-3.02	-2.98	-1.76	-2.10
	[-4.3]**	[-4.8]**	[-4.1]**	[-4.4]**	[-0.2]	[-0.2]	[0.3]	[-1.1]	[-5.9]**	[-5.4]**	[-5.6]**	[-4.7]**
Relative	-0.73	-0.81	-0.82	-0.76	-0.69	-0.69	-0.69	-0.71	-0.55	-0.48	-0.39	-0.53
Prices	[-5.4]**	[-5.0]**	[-5.2]**	[-4.7]**	[-4.8]**	[-6.2]**	[-7.8]**	[-6.2]**	[-2.3]*	[-1.8]	[-2.4]*	[-2.0]*
Domestic	1.45	1.53	1.03	1.52					0.95	0.90	0.96	1.09
demand	[4.0]**	[5.5]**	[4.2]**	[5.3]**					[5.6]**	[4.6]**	[7.8]**	[7.2]**
NEER	3.91	4.41	4.26	3.79	0.63	0.72	0.58	1.06				
	[3.8]**	[3.5]**	[3.6]**	[3.1]**	[2.2]*	[2.4]*	[2.0]*	[3.4]**				
[NEER]^2	-0.35	-0.39	-0.41	-0.33	-0.07	-0.08	-0.07	-0.11				
	[-3.3]**	[-3.1]**	[-3.4]**	[-2.6]**	[-2.7]**	[-3.2]**	[-3.0]**	[-4.2]**				
Lag of	0.33	0.31	0.35	0.32	0.25	0.26	0.27	0.25	0.30	0.33	0.42	0.36
Dependent variable	[4.3]**	[4.9]**	[5.7]**	[5.0]**	[3.3]**	[4.3]**	[4.6]**	[3.9]**	[4.5]**	[4.2]**	[5.9]**	[4.6]**
Observations:	153	153	154	154	153	153	154	153	153	153	154	154
R-squared:	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Q_1	0.0	0.1	0.0	0.1	2.1	1.6	1.0	2.6	0.2	0.0	0.2	0.0
	(1.0)	(0.7)	(0.9)	(0.7)	(0.1)	(0.2)	(0.3)	(0.1)	(0.7)	(0.9)	(0.6)	(0.9)
Q^2	1.0	1.1	0.7	1.0	3.2	2.3	2.7	1.7	4.1	4.1	2.5	4.8
	(0.3)	(0.3)	(0.4)	(0.3)	(0.1)	(0.1)	(0.1)	(0.2)	(0.0)	(0.0)	(0.1)	(0.0)
J-B	7.9	6.2	7.8	5.9	4.1	4.4	3.8	4.5	2.3	2.2	1.5	2.0
	(0.0)	(0.0)	(0.0)	(0.1)	(0.1)	(0.1)	(0.2)	(0.1)	(0.3)	(0.3)	(0.5)	(0.4)
CD-F	53.4	53.4		71.5	47.6	47.6		20.6	8.7	9.8		12.7
D-W	2.0	1.9	1.9	1.9	1.8	1.8	1.8	2.0	1.9	2.0	2.1	2.0

Source: Authors' calculations.

Table A6: Estimation Results of Real Imports

	Real Imports of Food & Live Animals				Real Imports of Manufactured good				Real Imports of Minerals, Fuel and Lubricants			
Method:	**GMM**	**LIML**	**LS**	**TSLS**	**GMM**	**LIML**	**LS**	**TSLS**	**GMM**	**LIML**	**LS**	**TSLS**
Constant	0.49	0.45	0.46	0.45	-1.88	-0.77	-0.36	0.01	-0.19	-0.22	-0.17	-0.22
	[3.1]**	[2.3]*	[2.3]*	[2.3]*	[-1.8]	[-0.6]	[-0.5]	[0.1]	[-1.6]	[-1.6]	[-1.3]	[-1.6]
Relative	-0.60	-0.59	-0.61	-0.59	-0.70	-0.78	-0.50	-0.60	-0.07	-0.08	-0.06	-0.08
Prices	[-3.7]**	[-3.4]**	[-3.6]**	[-3.4]**	[-4.2]**	[-4.2]**	[-4.6]**	[-3.4]**	[-2.9]**	[-2.4]*	[-1.9]	[-2.4]*
Domestic	0.60	0.61	0.59	0.61	0.20	0.24	0.40	0.39	0.03	0.04	0.03	0.04
demand	[9.3]**	[8.7]**	[8.5]**	[8.7]**	[1.7]	[1.7]	[4.7]**	[4.0]**	[1.4]	[1.4]	[1.2]	[1.4]
NEER					0.46	0.27	0.16	0.11				
					[2.4]*	[1.2]	[1.7]	[0.9]				
Lag of	0.31	0.31	0.33	0.31	0.48	0.46	0.45	0.44	-0.44	-0.43	-0.43	-0.43
Dependent variable	[5.1]**	[4.61]**	[5.0]**	[4.6]**	[8.1]**	[8.6]**	[8.8]**	[8.3]**	[-9.8]**	[-6.4]**	[-6.4]**	[-6.4]**
Observations:	154	154	154	154	153	153	154	153	153	153	153	153
R-squared:	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.42	0.42	0.42	0.42
Q_1	0.1	0.1	0.4	0.1	0.4	0.7	0.1	0.2	1.75	1.88	2.22	1.89
	(0.7)	(0.7)	(0.6)	(0.7)	(0.5)	(0.4)	(0.8)	(0.7)	(0.19)	(0.17)	(0.14)	(0.17)
Q^2	2.2	2.2	2.3	2.2	4.4	3.2	6.3	6.2	0.10	0.17	0.22	0.17
	(0.1)	(0.1)	(0.1)	(0.1)	(0.0)	(0.1)	(0.0)	(0.0)	(0.75)	(0.68)	(0.64)	(0.68)
J-B	1.7	1.8	1.8	1.8	3.0	3.2	4.8	4.5	5.17	3.94	4.64	3.96
	(0.4)	(0.4)	(0.4)	(0.4)	(0.2)	(0.2)	(0.1)	(0.1)	(0.08)	(0.14)	(0.10)	(0.14)
CD-F	1047.5	1047.5		881.4	9.1	9.1		14.8	109.9	109.9		109.9
D-W	2.0	2.0	2.1	2.0	1.9	1.9	1.9	1.9	2.21	2.22	2.12	2.22

Source: Authors' calculations.

Table A7: Estimation Results of Real Imports

	Real Imports of Misc. Manufactured good				Real Imports of Machinery & transport				Real Imports of Vegetables, oil and Fats				Real Imports Overall			
Method:	**GMM**	**LIML**	**LS**	**TSLS**	**GMM**	**LIML**	**LS**	**TSLS**	**GMM**	**LIML**	**LS**	**TSLS**	**GMM**	**LIML**	**LS**	**TSLS**
Constant	-6.92	-6.58	-4.70	-6.31	-9.00	-10.21	-9.80	-10.17	-20.91	-21.21	-11.14	-20.62	-1.69	-3.40	-0.06	-2.61
	[-4.5]**	[-3.6]**	[-2.9]**	[-3.4]**	[-4.6]**	[-4.4]**	[-4.5]**	[-4.4]**	[-3.4]**	[-2.8]**	[-2.0]*	[-2.7]**	[-1.4]	[-2.9]**	[-0.1]	[-2.8]*
Relative Prices	-0.23	-0.21	-0.14	-0.20	-0.15	-0.19	0.01	-0.18	-0.56	-0.45	-0.48	-0.46	-0.49	-0.34	-0.16	-0.19
	[-2.6]*	[-1.9]	[-1.7]	[-1.8]	[-2.3]*	[-2.0]*	[0.1]	[-1.9]	[-2.5]*	[-1.9]	[-2.7]**	[-1.9]	[-4.2]**	[-2.8]**	[-2.1]*	[-1.7]
[Relative Prices]^2	0.08	0.08	0.07	0.08					-1.00	-0.86	-0.78	-0.86				
	[5.78]**	[4.45]**	[3.94]**	[4.37]**					[-2.8]**	[-2.4]*	[-2.9]**	[-2.4]*				
Domestic demand	0.71	0.67	0.51	0.64	1.27	1.33	0.86	1.28	7.83	8.33	4.37	8.08	0.99	0.71	0.32	0.53
	[4.2]**	[3.5]**	[3.2]**	[3.4]**	[3.2]**	[3.9]**	[3.2]**	[3.8]**	[2.7]**	[2.9]**	[2.3]*	[2.8]**	[11.0]**	[4.5]**	[3.3]**	[3.5]**
[Domestic demand]^2									-0.95	-1.02	-0.54	-0.99				
									[-2.8]**	[-3.0]**	[-2.5]*	[-2.9]**				
NEER	0.96	0.93	0.71	0.90	1.14	1.33	1.50	1.34	3.81	3.38	2.64	3.36	0.77	1.11	0.17	1.03
	[5.1]**	[4.1]**	[3.5]**	[4.0]**	[3.9]**	[3.7]**	[4.4]**	[3.7]**	[2.3]*	[1.9]	[1.6]	[1.9]	[2.0]*	[3.2]**	[1.5]	[3.0]**
[NEER]^2									-0.37	-0.32	-0.27	-0.32	-0.09	-0.07		-0.06
									[-2.0]	[-1.7]	[-1.6]	[-1.7]	[-2.3]*	[-2.3]*		[-2.0]*
Lag of Dependent variable	0.46	0.46	0.50	0.47	0.23	0.16	0.23	0.16	0.01	0.07	0.14	0.07			0.37	
	[7.0]**	[6.6]**	[7.5]**	[6.6]**	[2.4]*	[1.9]	[2.9]**	[1.9]	[0.1]	[0.9]	[1.7]	[0.8]			[5.9]**	
Observations:	153	153	154	153	152	152	154	152	154	154	154	154	152	153	154	153
R-squared:	0.81	0.81	0.82	0.81	0.82	0.81	0.83	0.82	0.81	0.81	0.82	0.82	0.92	0.94	0.97	0.94
Q_1	0.16	1.88	0.73	0.23	0.55	0.01	0.23	0	1.32	0.2	0.02	0.17	6.8	9.11	0.48	10.46
	(0.7)	(0.2)	(0.4)	(0.6)	(0.5)	(0.9)	(0.6)	(1.0)	(0.3)	(0.7)	(0.9)	(0.7)	(0.0)	(0.0)	(0.5)	(0.0)
Q^2	1	0.17	0.23	0.74	0.43	0.02	1.47	0.05	0.54	0.11	0.82	0.14	0.12	0.45	1.02	0.93
	(0.3)	(0.7)	(0.6)	(0.4)	(0.5)	(0.9)	(0.2)	(0.8)	(0.5)	(0.7)	(0.4)	(0.7)	(0.7)	(0.5)	(0.3)	(0.3)
J-B	44.8	3.94	66.85	39.53	75.89	85.71	59.79	84.16	13.16	21.28	6.72	19.9	36.38	34.17	1.19	31.27
	(0.0)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.6)	(0.0)
CD-F	15.8	15.8		15.8	21.0	21.0		21.0	9.5	9.5		9.5	23.6	11.4		11.4
D-W	2.21	2.22	2.13	2.08	2.12	1.99	2.08	2.00	1.77	1.89	1.98	1.90	1.56	1.50	1.89	1.47

Source: Authors' calculations.