https://doi.org/10.3126/kmr.v2i1.94633

Trade Openness, Exchange Rate Volatility and Export Performance in Nepal

Surya Bahadur Rana
Principal, Kshitiz International College, Butwal, Nepal
Email: surryabrana@gmail.com (Corresponding Author)
https://orcid.org/0009-0004-7587-6223

Sweta Baniya*, Anisha Khanal*, Nisha Bhusal*, Nisha Pandey*, Asmita Subedi*, Anisha Shrestha*
**MBA scholars, Kshitiz international college, Butwal, Nepal*

Article History
Received 03 Jan, 2026
Reviewed 05 Feb, 2026
Revised 29 Feb, 2026
Accepted 06 March, 2026

Keywords
ARDL, Export performance, Exchange rate volatility, Real exchange rate, Trade openness

Kshitiz Management Review
Volume 2, Issue 1, April 2026, pp. 1- 14.
ISSN: 3059-975X (Print)

Abstract

This paper analyzes the long-run relationship among trade openness, exchange rate volatility, and export performance in Nepal using the ARDL bounds testing approach for the period 1979–2024. The results of unit root test reveals that the variables are integrated either at order zero or at order one or at the combination of both, validating the applicability of the ARDL model. The ARDL bounds test reveals the existence of a stable long-run relationship among trade openness, exchange rate volatility, the real exchange rate, inflation, and export performance. The results of long-run estimation show that trade openness has a significant positive effect on export performance in Nepal, indicating that greater integration into the global economy enhances export growth and competitiveness. In contrast, exchange rate volatility, the real exchange rate, and inflation do not exhibit significant long-run effects on export performance. The error correction model indicates that short-run disequilibrium adjusts toward long-run equilibrium at a moderate speed of 27.97 percent annually. The study recommends promoting trade openness, export diversification, and exchange rate stability to strengthen Nepal's export performance and international competitiveness.

Introduction

Export performance of any nation is shaped by a range of important macroeconomic factors and, in turn, influences the course of economic growth, employment levels, and foreign earnings (Krugman et al., 2018). In Nepal, the export sector has shown pronounced instability and has stayed weak largely due to structural constraints. In addition to these structural bottlenecks, limited product and market diversification and exposure to external economic shocks have further undermined Nepal's export outcomes (World Bank, 2023). Among the macroeconomic determinants potentially influencing exports are trade openness and exchange rate volatility.

Trade openness denotes the extent to which an economy is integrated with global markets through trade and cross-border investment. Higher level of trade openness can stimulate a country's access to global markets, escalating competition, easing technology transmission,

and cultivating resource allocation, thereby fostering export growth (Grossman & Helpman, 1991). In case of developing countries like Nepal, liberalization and expansion of trade helps generating prospects for export expansion by increasing regional and global economic integration. However, an economy with inadequate production size should overly dependent on imports, which may distort the advantages of trade openness (World Bank, 2023).

Besides trade openness, the outcomes from exports in an economy also depends on the volatility of currency exchange rate of the country relative to foreign currency. Higher volatility in exchange rates diminishes a country's price competitiveness in international markets, thereby increasing uncertainty for foreign traders. Higher volatility dampens exports by intensifying risk, making foreign income unpredictable, and increasing the cost of international trade (Clark et al., 2004). In developing countries like Nepal exporters frequently are more exposed to exchange rate risk due to underdeveloped financial markets and less availability of hedging instruments. Nepal has pegged exchange rate system with Indian currencies, and therefore Nepali rupee is linked to other currencies through the exchange rate of Indian currencies relative to other currencies (Nepal Rastra Bank, 2022). As a result, devaluation of Indian currencies relative to other currencies also reduces the purchasing power of Nepali rupees, thereby adversely affecting the export income.

There are other macroeconomic variables that affect export performance in a country. Some of the prominent variables of them include the real exchange rate and inflation. A decline in the real exchange rate makes a country's exports cheaper in international markets, thereby strengthening competitiveness, whereas high rate of inflation decreases the competitive capacity of a country in the international market by heightening the costs of exports (Bahmani-Oskooee & Hegerty, 2007).

Based on given background, study attempts to analyze the effects of trade openness, exchange rate volatility, the real exchange rate, and inflation on export performance in Nepal. For this purpose, the study makes use of time-series econometric model, namely ARDL-bonds testing approach to uncover the long-run and short-run dynamics of the relationship among these variables. The study findings are expected to provide important feedbacks on designing effective trade and exchange rate policies, thereby encouraging export growth and stability, and backing up long-run economic growth of Nepal.

Literature Review

Trade openness is commonly accredited as a main factor determining the export performance for both developed and emerging economies through economic expansion. According to international trade theory, higher level of trade openness allows a country to become more focused per its comparative advantage. It helps improving efficiency, fascinating international investment, and easing access to global markets (Krugman et al., 2018). Increased trade openness also speeds up technology transmission, enhances productivity, and boosts foreign trade diversification by sustaining export growth (Grossman & Helpman, 1991). Trade openness can assist as a way to increase regional and global

economic integration for a country like Nepal, thereby promoting international trade and industries.

Empirical evidences have shown a positive effect of trade openness on export performance. For example, Sachs and Warner (1995) demonstrated that countries with higher degree of trade openness have speedy growth in exports as compared against those having lower level of trade openness. In the context of developing countries, Dollar and Kraay (2004) documented that countries with higher integration with global economy can expand their exports and foreign earnings. In the similar line, Edwards (1998) postulated that higher level of trade openness makes resource allocation more efficient, thereby encouraging export competitiveness. However, studies such as Jansen and Nordas (2004) including Omoke and Opuala-Charles (2021), among others, showed that the level of benefits a country can achieve from trade openness also depends on the factors like institutional quality, infrastructure, and industrial capabilities of the country. Generally, a country that has a poor institutional, infrastructural and productive capacity depends more on imports with no corresponding growth in exports, thereby facing continuous trade deficits.

Nepal increased its exposure to international markets after the 1990s when government adopted liberalization policies. Nepal's membership in the World Trade Organization (WTO) and its regional integration through the membership in the SAARC further extended Nepal's economic integration with world markets. However, Nepal continues to experience fragile export performance, primarily due to lack of industrial, infrastructural, and institutional development, as well as limited diversification of export products (World Bank, 2023). Against this backdrop, it is necessary to examine how Nepal's integration into the world economy through trade openness has contributed for the expansion of country's exports in the present situation.

Besides trade openness, volatility in exchange rate also greatly affects exports performance of a country. Exchange rate volatility refers to the degree to which currency exchange rate of a country fluctuates unpredictably relative to foreign currencies. In this regard, some studies, such as Clark (1973), and Hooper and Kohlhagen (1978), posit that continuous volatility in exchange rate increases uncertainty and risk in international trade, thereby disheartening risk-averse exporters. However, the theoretical linkage between exchange rate volatility and export performance is sometimes not clear. For example, De Grauwe (1988) argues that intensity of the effect hinges on the risk preferences of traders and the market structure of countries. Sometimes, volatility can generate profit making opportunities, thereby increasing exports. With respect to exchange rate volatility effects on export performance, empirical studies provide mixed evidences. For example, Frankel and Wei (1993) showed negative effects of exchange rate volatility on export performance. Similarly, MacDonald and Vieira (2010) showed that the intensity of negative effects is higher in countries having less developed financial markets and hedging instruments. Bahmani-Oskooee and Hegerty (2007) conclude that volatility's effects also vary across countries, industries, and empirical methods, and therefore volatility effect is always not negative. For example, Hsu and Chiang (2011) observed the non-linear effects of exchange rate volatility on exports. The study

particularly found that exchange rate volatility negatively affected the exports in high-income countries, whereas the effect was positive in the context of low-income countries.

Studies from South Asia often find negative effects of exchange rate volatility on exports in countries like India, Pakistan, and Sri Lanka (Mukhtar & Malik, 2010). Nepal shares many characteristics with these countries in terms of trade structure and export concentration, yet empirical work specific to Nepal is scarce. Among such studies, Paudel and Burke (2015) investigated exchange rate effects on Nepal's exports for 1980–2010 and documented a considerable appreciation of the real exchange rate from the late 1990s; using a gravity model they found that real appreciation adversely affected exports, suggesting reconsideration of the currency peg. Similarly, Essayyad, Palamuleni and Satyal (2018), in the case of Nepal, documented that long-run appreciation in real exchange rate negatively affects export performance of the country. In a more recent study, Devkota and Panta (2019) analyzed cointegration among exports, imports, and the USD exchange rate for 1965–2017 and found no long-run cointegrating relationship, implying Nepal's macro policies have struggled to maintain long-term balance between imports and exports. Rana (2020) examined the nexus between trade openness and growth in Nepal using ARDL method and exhibited a long-run positive relationship between trade, investment and growth. In particular, findings revealed that openness stimulates growth indirectly through the investment channel.

Besides the effects of trade openness and exchange rate, there are other literatures examining the linkage between real exchange rate, inflation, and exports. The empirical documentations in this regard are also mixed. Theoretically, it is argued that devaluation of real exchange rate of a country facilitates exports growth by making country's exports cheaper in global markets. On the other hand inflation erodes external demands for domestic products because it heightens the price of domestic products in international markets. In this line, Blecker (2023) empirically observed significant effects of real exchange rate on exports. The study also showed that the effect size varies across countries with different institutional quality and trade structure. In a recent study, Akusta (2026) revealed negative effects of increase in real exchange rate and inflation on export performance of Turkey in the long run.

Though there are numerous studies examining the connection among trade openness, exchange rate volatility, real exchange rate, inflation and export performance, country-specific empirical evidence integrating the dynamics of relationship among these variables are yet to uncover in the case of Nepal. Building on this background, the present study analyzes the empirical links between trade openness, exchange rate volatility, and export performance in Nepal using a more recent time-series dataset, aiming to enrich country-specific evidence on short- and long-run dynamics among these variables. Additionally, the study also attempts to verify whether there is any role of real exchange rate and inflation in determining the export performance in Nepal.

Research Methods

Research Design, Data and Variable

This study uses a causal research design to assess the effects of trade openness and exchange rate volatility on export performance in Nepal. The dependent variable of the study is export performance, while main independent variables of interest are trade openness and exchange rate volatility. In addition, other two variables, namely the real exchange rate and inflation, are included to examine their roles in predicting export performance in Nepal. Specifically, the study analyzes time series data on these variables to investigate the dynamics of short-run relationships and long-run equilibrium among them.

The economic time-series used in this study cover the time span from mid-July 1979 to mid-July 2024. The time series data set includes the data on nominal GDP, exports, imports, exchange rates, and the consumer price index (CPI) derived from Quarterly Economic Bulletin published by Nepal Rastra Bank. Export performance refers to the annual value of total exports from Nepal. It is used as dependent variable and labeled as '*lnEXP*'. It refers to the natural logarithm of real value of exports, where real exports are measured as nominal value of exports deflated by CPI of Nepal using the year 2024 as the base index. Natural log transformation of nominal exports enables interpretation of regression coefficients easier in the form of elasticity rather than rupee value.

Trade openness is the main independent variable of the study. It refers to the degree of Nepal's regional and global integration into the international market and is measured as the ratio of annual nominal value of imports plus exports to the annual nominal GDP. This variable is denoted as 'OPEN'. A higher ratio indicates a greater degree of openness or stronger integration of the domestic economy with the world economy. International trade theories, such as those proposed by Krueger (1978) and Balassa (1978), argue for a positive effect of OPEN on export performance. Consistent with these theories, this study hypothesizes that openness positively and significantly affects export performance in Nepal.

Exchange rate volatility is another main independent variable of interest in this study. It refers to the degree of uncertainty associated with the movement in exchange rate of Nepali currency relative to US dollar. The exchange rate is measured as the average of the monthly mid-point rates between the buying and selling rates of Nepali rupee per US dollar. In this study, the exchange rate volatility has been computed using two-stage procedures. First, log return series of the nominal exchange rate has been generated. Second, three-year rolling standard deviation series of the log return of nominal exchange rate has been computed, and labeled as '*ERV*'. Based on the cited literatures in this study, ERV is expected to have either positive or negative influence on the export performance in Nepal.

Additionally, the study uses two additional independent variables, namely real exchange rate and inflation, labeled as '*RER*' and '*lnCPI*', respectively. The level of real exchange rate and inflation both indicate the level of price competitiveness of a country. In this study, RER is measured as the exchange rate per US dollar adjusted to the ratio of CPI of Nepal to CPI of India. CPI of India has been chosen considering India being the main trading partner of

Nepal. Similarly, inflation is measured as natural logarithm of annual consumer price index of Nepal considering the year 2024 as the base. Theory predicts the negative effects of real exchange rate and inflation on export performance. For example, Krugman and Obstfeld (2018) argue that real exchange rate appreciation adversely affects export as country's products becomes expensive in international markets. Similarly, Salvatore (2013) argues that higher level of inflation in the country raises the production costs, leading to expensive price of products in international markets. Therefore, this study hypothesizes that *RER* and *lnCPI* significantly and negatively affect export performance in Nepal.

The Empirical Model

The empirical framework employed in this study is the autoregressive distributed lag (ARDL) model. The ARDL bounds testing method has been applied to investigate both the short-term dynamics and the long-run equilibrium relationship among the variables. Introduced by Pesaran, Shin, and Smith (2001), the ARDL method has several advantages over Johansen and Juselius (1990) VECM techniques. First, it accommodates variables that are *I(0), I(1)*, or a mix so long as none are *I(2)*. Additionally, it estimates a single reduced-form equation rather than a system. Moreover, it yields unbiased long-run estimates even with some endogenous regressors (Odhiambo, 2011). Finally, it is suitable for a study with relatively small sample sizes.

The general ARDL model is specified as in Equation (1):

$$\Delta \ln EXP_t = \beta_0 + \sum_{k=1}^{p} \beta_{1k} \Delta \ln EXP_{t-k} + \sum_{k=0}^{q_1} \beta_{2k} \Delta OPEN_{t-k} + \sum_{k=0}^{q_2} \beta_{3k} \Delta ERV_{t-k} + \sum_{k=0}^{q_3} \beta_{4k} \Delta RER_{t-k} + \sum_{k=0}^{q_4} \beta_{5k} \Delta \ln CPI_{t-k} + \lambda_1 \ln EXP_{t-1} + \lambda_2 OPEN_{t-1} + \lambda_3 ERV_{t-1} + \lambda_4 RER_{t-1} + \lambda_5 \ln CPI_{t-1} + \varepsilon_t \quad \ldots (1)$$

In Equation (1), the differenced variables capture short-run dynamics, while the lagged level variables represent the long-run equilibrium relationship among the variables. The coefficients β_{1k} to β_{5k} are short-run parameters that captures short-run dynamics of the model. Similarly, the coefficients λ_1 to λ_5 represent long-run coefficients. The null hypothesis tested is H_0: $\lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = 0$, implying the absence of a long-run relationship among the variables. Finally, ε_t denotes the white-noise error term in the model, which is assumed to be identically distributed with zero mean and constant variance.

The ARDL bounds testing procedure examines the cointegration relationship among variables. According to this approach, the null hypothesis of no cointegration is rejected when the calculated *F*-statistic is greater than the upper critical bound, indicating the presence of a long-run relationship among the variables irrespective of whether they are integrated of order *I(0), I(1)*, or mutually integrated. In contrast, the null hypothesis cannot be rejected when the *F*-statistic falls below the lower critical bound. However, if the F-statistic lies between the lower and upper bounds, the results remain inconclusive. The optimal lag

structure is determined using the Akaike Information Criterion (AIC), while the parameters of the model are estimated through the ordinary least squares (OLS) method.

After confirming the presence of cointegration relationship, the long-run model of the form specified in Equation (2) is estimated:

$$lnEXP_t = \beta_0 + \sum_{m=1}^{p} \beta_{1jm} ln\, EXP_{t-m} + \sum_{m=0}^{q_1} \beta_{2m} OPEN_{t-m} + \sum_{m=0}^{q_2} \beta_{3m} ERV_{t-j} + \sum_{m=0}^{q_3} \beta_{4m} RER_{t-j} + \sum_{m=0}^{q_4} \beta_{5jm} lnCPI_{t-j} + \upsilon_t \quad \ldots(2)$$

In Equation (2), p *and* q_1 to q_4 are the optimal lag lengths selected for each variable. The coefficients β_{ij} show the long-run effects, and υ_t is the stochastic error term with zero mean and constant variance.

Finally, the ECM presented in Equation (3) is estimated to measure the speed at which short-run deviations adjust toward the long-run equilibrium.

$$\Delta\, ln\, EXP_t = \alpha_0 + \sum_{k=1}^{p} \alpha_k \Delta\, lnEXP_{t-k} + \sum_{k=0}^{q_1} \beta_{2k} \Delta\, OPEN_{t-k} + \sum_{k=0}^{q_2} \beta_{3k} \Delta\, ERV_{t-k} + \sum_{k=0}^{q_3} \beta_{4k} \Delta\, RER_{t-k} + \sum_{k=0}^{q_4} \beta_{5k} \Delta\, lnCPI_{t-k} + \lambda ECT_{t-1} + \varepsilon_t \quad \ldots(3)$$

In Equation (3), λ is the coefficient of error correction term (ECT). A negative and significant coefficient of ECT provides evidence of a steady long-run relationship among the variables. The magnitude of ECT coefficient shows the speed at which short-term deviations are adjusted back towards long-run equilibrium.

Diagnostic and Stability Tests

In this study, several diagnostic and stability tests are conducted confirm the robustness, adequacy, validity and stability of the estimated model. These tests include the tests for residual normality, serial correlation, heteroscedasticity, functional form (Ramsey RESET), and parameter stability (CUSUM and CUSUMSQ). The residual normality test has been used to confirm whether residuals are normally distributed. This test is important for making valid statistical inference. The serial correlation test has been conducted to examine whether residuals from the model are correlated across time. The presence of serial correlation in residuals result in inefficient estimates and biased standard errors in the model. The heteroscedasticity test has been performed to ensure that variance of the residuals are constant over time. The presence of heteroscedasticity in the residuals distort the efficiency and reliability of the estimated coefficients.

In addition, Ramsey RESET test has been conducted to confirm whether the model is correctly specified. Incorrect functional form of the model leads to potential omitted variable

bias. Finally, CUSUM and CUSUMSQ tests have been employed to ensure that estimated parameters are stable over time and there is no structural break.

Study Results and Discussion

Unit Root Test Results

Before conducting the ARDL bounds test, the ADF unit root test was applied to determine the order of integration of the variables, because ARDL requires that none of them be *I(2)*. The results are shown in Table 1.

Table 1

ADF test statistics

Variables	Level series		First difference series	
	Test statistics	p-values	Test statistics	p-values
lnExp	-1.4418	0.5530	-5.7573*	0.000
OPEN	-0.1409	0.9383	-8.2969*	0.0000
ERV	-3.3498**	0.0183	-7.1995*	0.0000
lnCPI	-2.4816	0.1267	-4.2273*	0.0017
RER	0.2711	0.9741	-6.0437*	0.0000

Note: '' p-value < 0.01; '**' p-value < 0.05*

Table 1 indicates that *lnEXP*, *OPEN*, *lnCPI*, and *RER* become stationary after first differencing and are thus *I(1)*. *ERV* is stationary at level and hence *I(0)*. None of variable is *I(2)*, therefore the ARDL methodology is suitable for this analysis.

F-Bounds Test Results

After having confirmed the order of integration, the *F*-bounds test was performed to ensure the existence of long-run relationship among variables. The *F*-bounds test outcomes are reported in Table 2.

Table 2

F-bounds test statistics

F-bounds test:				
Test Statistic	Value	Sig.	I(0)	I(1)
			Finite Sample: n = 45	
F-statistic	4.8896	10%	2.638	3.772
k	4	5%	3.178	4.450
Actual Sample Size	42	1%	4.394	5.914

Using a maximum of 46 annual observations, automatic lag selection (based on AIC) identified an optimal lag length of 4. The computed F-statistic is 4.8896, which exceeds the 5 percent upper bound critical value of 4.450. Consequently, the hypothesis indicating no long-run association among the variables is rejected, confirming the presence of a stable cointegration among export performance, trade openness, exchange rate volatility, the real

exchange rate, and inflation in the long-run. These results suggest that variables move together toward a long-run equilibrium, even if a short-run disequilibria occur.

Estimated Long-Run Results

This section presents the results of estimated long-run relationship, and the long-run coefficients are reported in Table 3. As the results report, the coefficient of *OPEN* (6.2385) has a positive sign and is significant at the 1 percent level. This result supports the hypothesis that trade openness has a long-run positive effect on export performance in Nepal.

Table 3

Estimated long-run relationships

Variable	Coefficient	Std. error	t-statistics	p-values
OPEN	6.2385	1.4555	4.2862	0.0002
ERV	-4.0816	4.9431	-0.8257	0.4159
lnCPI	1.1800	0.7365	1.6022	0.1203
RER	0.0093	0.0164	0.5653	0.5764

The positive and significant coefficient of trade openness observed in this study simply means that greater involvement of Nepal in global trade reasonably promotes export performance. This finding is consistent with theoretical prediction that trade openness enhances country's productivity, competitiveness, and hence export performance.

However, the study result showed no significant role of exchange rate volatility in predicting export performance as ERV coefficient (-4.0816) is not statistically significant. Insignificant ERV effect is possibly attributed to the fact that Nepal has limited diversification of its export products and has limited access to global capital markets. In the similar line, inflation and the real exchange rate also exhibit no significant long-run effects on export performance in Nepal. These results imply that price factors in isolation do not capture the export performance in Nepal. Instead, other factors such as industrial productivity, deficit infrastructures and concentrated export play more critical roles in determining export performance.

ECM Estimation Results

Table 4 reports the estimated short-run dynamics obtained from the error correction model (ECM). The coefficient of ECT(-1) estimated at -0.2797 and is significant at the 1 percent level. This negative and significant coefficient confirms the convergence toward long-run equilibrium, implying that approximately 27.92 percent of short-run disequilibrium is corrected annually. This finding suggest a moderate pace of adjustment towards the long-run equilibrium following short-term shocks.

Furthermore, the coefficient of *D(OPEN), 2.7227,* is positive and significant at the 1 percent level. It indicates immediate short-term effect of trade openness, implying that increased trade openness produces instant benefits in export performance. It can be also noted that the second and third lagged D(OPEN) have negative and significant coefficients. It shows that trade openness exhibits temporary counter effects after the immediate positive effects,

implying that effects of trade openness on exports changes over time before reaching long-run equilibrium.

Table 4

ECM regression results

Variable	Coefficient	Std. Error	t-statistics	*p*-values
C	1.1754	0.2174	5.4073	0.0000
D(OPEN)	2.7227	0.5729	4.7524	0.0001
D(OPEN(-1))	-0.5111	0.5236	-0.9762	0.3373
D(OPEN(-2))	-2.0832	0.5109	-4.0776	0.0003
D(OPEN(-3))	-2.3952	0.4716	-5.0790	0.0000
D(ERV)	0.0531	0.7426	0.0715	0.9435
D(ERV(-1))	0.8003	0.7488	1.0688	0.2943
D(ERV(-2))	2.58782	0.7629	3.3919	0.0021
D(ERV(-3))	1.7484	0.7766	2.2515	0.0324
ECT(-1)*	-0.2797	0.0529	-5.2859	0.0000
R^2 = 0.6464; Ad. R^2 = 0.5469; F-stat. = (6.5002); p-value (F-stat.) = 0.0000				

Exchange rate volatility, *D(ERV)*, has the contemporary short-run positive coefficient (0.0531) but not statistically significant. Therefore, there is no immediate effect of exchange rate volatility on exports. However, second and third lagged coefficients of D(ERV) are positive and significant. This implies that export responses to change in exchange rates with a delay, suggesting that exporters take a time to adjust their decisions in response to the change in exchange rates.

Model Diagnostic and Stability Test Results

A set of diagnostic and stability checks was performed to evaluate model reliability. The Jarque-Bera test yields a statistic of 5.7313 with *p*-value 0.0569, which exceeds the 0.05 threshold; thus residual normality cannot be rejected.

Table 5

Diagnostic test statistics

Jarque-Bera test of normality:			
JB stat.	5.7313	*p*-value	0.0569
Serial correlation LM test:			
F-statistic	0.9391	*p*-value F(2,26)	0.4038
Obs*R-squared	2.8296	*p*-value Chi-Square(2)	0.2430
Heteroskedasticity test:			
F-stat.	0.5559	*p*-value F(13,28)	0.8674
Obs*R-squared	8.6171	*p*-value Chi-Square(13)	0.8012

Ramsey RESET test statistics			
Test statistics	Value	d.f.	*p*-value
t-stat.	1.0039	27	0.3243
F-stat.	1.0079	(1, 27)	0.3243

The serial correlation LM test fails to reject the null hypothesis of the absence of serial correlation (*p*-values above 0.05), indicating residuals are free from serial dependence. The Breusch–Pagan test shows no heteroscedasticity (*p*-values > 0.05). The Ramsey RESET test's *p*-value exceeds 0.05, implying no evidence of omitted variables and that the model specification is adequate.

The study also performed parameter stability test using the CUSUM and CUSUMSQ tests. The results are reported in Figure 1 and Figure 2. Results indicate that recursive residuals in both figures fall within the 5 percent critical bounds. It implies that estimated parameters are stable, and there is no structural breaks over the sample period. Hence, these diagnostic and stability tests establish the robustness, reliability and validity of ARDL model used in this study.

Figure 1

CUSUM plot

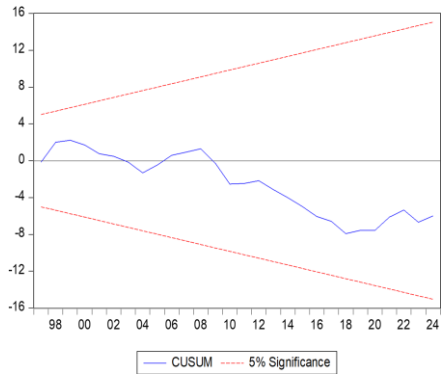
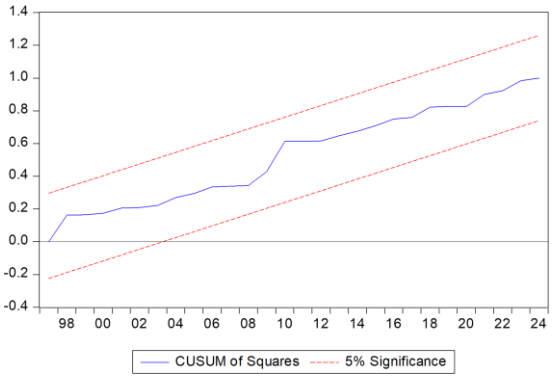


Figure 2

CUSUM of squared plot



To sum up, the findings from the study establish trade openness as a key factor determining export performance in Nepal, implying that Nepal's larger integration in international trade can increases competitiveness and yield greater export opportunities. The observed insignificant long-run role of exchange rate volatility further suggests that Nepal suffers from structural and institutional constraints. Therefore, adequate attention is necessary to increase export diversification and to strengthen industrial capacity.

Conclusion and Implications

This study analyzed the long-run relationship among trade openness, exchange rate volatility, and export performance in Nepal using the ARDL bounds testing approach for the period 1979–2024. The unit root test results revealed that the variables are integrated either at order zero or at order one or at the combination of both, validating the applicability of the ARDL model. The ARDL bounds test revealed the existence of a stable long-run relationship among trade openness, exchange rate volatility, the real exchange rate, inflation, and export performance.

The long-run estimation results showed that trade openness positively and significantly affects export performance in Nepal, indicating that greater integration into the global economy enhances export growth and competitiveness. Consistent with theory, this result implies that deeper global integration can encourage exports through expanded market access and enhanced competitiveness. In contrast, exchange rate volatility, the real exchange rate, and inflation did not exhibit significant long-run effects on export performance. The insignificant role of exchange rate volatility suggests that this variable was not primary driver for affecting Nepal's export performance during the sample period. Such observation may be the result of limited export diversification and heavy trade ties with India. The insignificant roles of real exchange rate and inflation also establish the importance of structural and institutional factors over price variables.

The error correction model indicated that short-run disequilibrium adjusts toward long-run equilibrium at a moderate speed of 27.97 percent annually. Similarly, trade openness produced immediate positive effects on exports, whereas exchange rate volatility showed negative lagged effects. This result suggests that exporters adjust their export decisions over time to exchange-rate movements with a delay.

Based on the findings from the study, some implications can be recommended. First, considering the strong positive long-run effect of trade openness, policy should be directed toward deepening economic integration of Nepal with regional and world markets. The policy should also attempt for reducing trade barriers, enhancing export diversification, and improving trade facilitation to increase the openness of the economy. Second, despite negligible role of exchange rate volatility in export performance, Nepal's growing economic associations beyond India could promote the importance of exchange-rate stability. Therefore, there is need to maintain a stable exchange-rate primarily to reduce transaction risk in international trade.

Besides implications, the study also pose some limitations. First, the sample size used in this study was relatively smaller. Second, large number of other explanatory variables, such as FDI, political stability, infrastructure development, and external demand, could not be considered due to limited range of observations. Third, the study relied only on aggregate export data, which did not account for the difference in sectoral exports. Thus future studies are suggested to incorporate broad array of variables along with more extended period and sectoral export performance in Nepal.

References

Akusta, E. (2026). Investigating the impacts of exchange rate and inflation on exports: A double threat or opportunity for Türkiye*? arXiv*. https://doi.org/10.48550/arXiv.2604.12991

Bahmani-Oskooee, M., & Hegerty, S. W. (2007). Exchange rate volatility and trade flows: A review article. *Journal of Economic Studies, 34*(3), 211–255. https://doi.org/10.1108/01443580710772777

Balassa, B. (1978). Exports and economic growth: Further evidence. *Journal of Development Economics, 5*(2), 181–189. https://doi.org/10.1016/0304-3878(78)90006-8

Blecker, R. A. (2023). How important is the real exchange rate for exports and growth? *European Journal of Economics and Economic Policies: Intervention, 20*(2), 250–265. https://doi.org/10.4337/ejeep.2023.0099

Clark, P. B. (1973). Uncertainty, exchange risk, and the level of international trade. *Western Economic Journal, 11*(3), 302–313. https://doi.org/10.1111/j.1465-7295.1973.tb01063.x

Clark, P. B., Tamirisa, N., Wei, S.-J., Sadikov, A., & Zeng, L. (2004). *Exchange rate volatility and trade flows: Some new evidence* (IMF Occasional Paper No. 235). International Monetary Fund.

De Grauwe, P. (1988). Exchange rate variability and the slowdown in growth of international trade. *IMF Staff Papers, 35*(1), 63–84. https://doi.org/10.2307/3867277

Devkota, M. L., & Panta, H. (2019). Are exports, imports, and exchange rates cointegrated? Empirical evidence from Nepal. *International Journal of Economics and Financial Issues, 9*(2), 273–276. https://doi.org/10.32479/ijefi.7588

Dollar, D., & Kraay, A. (2004). Trade, growth, and poverty. *The Economic Journal, 114*(493), F22–F49. https://doi.org/10.1111/j.0013-0133.2004.00186.x

Edwards, S. (1998). Openness, productivity and growth: What do we really know? *The Economic Journal, 108*(447), 383–398. https://doi.org/10.1111/1468-0297.00293

Essayyad, M., Palamuleni, M., & Satyal, C. (2018). Remittances and real exchange rates in South Asia: The case of Nepal. *Asian Economic and Financial Review*, *8*(10), 1226–1238. https://doi.org/10.18488/journal.aefr.2018.810.1226.1238

Frankel, J. A., & Wei, S.-J. (1993). Trade blocs and currency blocs. *National Bureau of Economic Research Working Paper Series*, No. 4335. https://doi.org/10.3386/w4335

Grossman, G. M., & Helpman, E. (1991). *Innovation and growth in the global economy*. Cambridge, MA: MIT Press.

Hooper, P., & Kohlhagen, S. W. (1978). The effect of exchange rate uncertainty on the prices and volume of international trade. *Journal of International Economics, 8*(4), 483–511. https://doi.org/10.1016/0022-1996(78)90034-8

Hsu, K. C., & Chiang, H. C. (2011). The threshold effects of exchange rate volatility on exports: Evidence from US bilateral exports. *The Journal of International Trade & Economic Development, 20*(1), 113–128. https://doi.org/10.1080/09638190902898105

Jansen, M., & Nordas, H. K. (2004). *Institutions, trade policy and trade flows* (WTO Staff Working Paper No. ERSD-2004-02). World Trade Organization. https://doi.org/10.30875/0005b56b-en

Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration with application for the demand for money. *Oxford Bulletin of Economics and Statistics, 52*, 169-210. https://doi.org/10.1111/j.1468-0084.1990.mp52002003.x

Krugman, P. R., Obstfeld, M., & Melitz, M. J. (2018). *International economics: Theory and policy* (11th ed.). Harlow, England: Pearson Education Limited.

MacDonald, R., & Vieira, R. S. (2010). A panel data investigation of real exchange rate misalignment and growth. *CESifo Working Paper Series*, No. 3061. CESifo Group Munich.

Mukhtar, T., & Malik, S. J. (2010). Exchange rate volatility and export growth: Evidence from selected South Asian countries. *Zagreb International Review of Economics & Business, 13*(2), 27–37.

Nepal Rastra Bank. (2022). *Current macroeconomic and financial situation of Nepal*. Nepal Rastra Bank.

Odhiambo, N. M. (2011). Financial intermediaries versus financial markets: A South African experience. *International Business & Economics Research Journal, 10*(2), 77-84. https://doi.org/10.19030/iber.v10i2.1795

Omoke, P. C., & Opuala-Charles, S. (2021). Trade openness and economic growth nexus: Exploring the role of institutional quality in Nigeria. *Cogent Economics & Finance, 9(*1), 1869211. https://doi.org/10.1080/23322039.2020.1869211

Paudel, R. C., & Burke, P. J. (2015). *Exchange rate policy and export performance in a landlocked developing country: The case of Nepal* (Working Paper No. 2015/05). Arndt-Corden Department of Economics, Crawford School of Public Policy, ANU College of Asia and the Pacific, Australian National University.

Pesaran, H. M., & Shin, Y. (1995). *An autoregressive distributed lag modeling approach to cointegration analysis*. DAE Working Paper Series No. 9514, Department of Applied Economics, University of Cambridge, Cambridge, UK.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics, 16*(3), 289–326. https://doi.org/10.1002/jae.616

Rana, S. B. (2020). Trade openness and economic growth in Nepal. *Butwal Campus Journal*, *3*(1), 1-20. https://doi.org/10.3126/bcj.v3i1.36493

Sachs, J. D., & Warner, A. M. (1995). *Economic reform and the process of global integration. Brookings Papers on Economic Activity, 1995* (1), 1–118. https://doi.org/10.2307/2534573

Salvatore, D. (2013). *International economics* (11th ed.). Hoboken, NJ: John Wiley & Sons.

World Bank. (2023). *Nepal development update: Export competitiveness and trade performance.* World Bank.