Vietnam and its major Trading Partners: the impact on exchange rates

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ABSTRACT

Despite the limited research on the J-curve phenomenon in Vietnam, my paper delves into the short-term and long-term effects of the Vietnamese Dong's real exchange rate depreciation on the trade balance with its 11 principal trading partners. This study not only provides valuable insights and evidence to support the J-curve theory but also underscores its significance in understanding the complex relationship between currency and trade dynamics. The results present in this paper, both theoretical and practical, not only shed light on this intricate relationship but also equip policymakers and economists with the knowledge to guide strategies for promoting sustainable and balanced economic growth in Vietnam, thereby empowering them to make informed decisions. This research is of utmost importance to understanding Vietnam's trade dynamics and the implications of currency fluctuations. It is a crucial read for economists, policymakers, and academic researchers interested in trade dynamics and exchange rates, as it can directly inform their work and policy decisions.

Keywords: J-Curve, Linear ARDL approach, Vietnam

JEL Classification F31, F32, F42, C10

Introduction

Exchange rates, a complex and multifaceted aspect of a nation's trade dynamics, are indispensable to almost every global market economy. Governments rigorously monitor and manage exchange rates as a critical tool to inform crucial economic decisions. Vietnam's journey from a centrally planned to a market economy has been a remarkable transformation, substantially reducing poverty and elevating the country to its status as a lower- and middle-income nation. This economic shift has established Vietnam as one of East Asia's most vibrant and swiftly advancing economies and underscored the importance of understanding the role of exchange rates in its trade dynamics. Under current Vietnamese law, the Vietnam Dong (VND) is the sole accepted payment form, mandating that all goods and services be priced and transacted in VND. The Vietnamese Dong (VND) is a cornerstone of the country's economy, with the State Bank of Vietnam (SBV) assuming a pivotal role in its management. The SBV's management of the VND is not just important, it's crucial. With the announcement of exchange rates and the establishment of exchange rate regimes, the SBV ensures the stability of the VND against other currencies. A managed floating exchange rate regime is in place, incorporating mechanisms to regulate exchange rates. The real exchange rate of the VND has experienced depreciation against the USD since 2000 (refer to Figure 1), prompting contemplation of its potential impact on Vietnam's bilateral and overall trade balance. Therefore, understanding the implications of this depreciation on Vietnam's economy is not just important; it's a key focus and a pressing need of this research.

Given Vietnam's heavy reliance on exports, any fluctuations in the exchange rate can have significant and potentially game-changing consequences. The potential impact of these fluctuations on Vietnam's economy is not to be underestimated. Thus, the SBV's pivotal role in managing the VND is not just important; it's indispensable to the success and stability of Vietnam's economy. The urgency of understanding and managing these fluctuations cannot be overstated. This research aims to provide a deeper understanding of these dynamics, offering potential strategies for managing these fluctuations effectively.

The J-curve phenomenon, a vital concept first identified by Magee in 1973 in the United States, plays a significant role in this study. This economic theory illustrates the fascinating dynamic when a country’s currency depreciates. Although the trade balance may initially decline, it ultimately rebounds and can even surpass previous performance levels. Understanding this phenomenon is essential for grasping the broader implications of currency fluctuations on trade. How a nation's trade balance reacts in the short run after an exchange rate devaluation is critical. Early studies centered on the Marshall-Lerner (ML) conditions assert that currency devaluation will improve the trade balance only if the sum of import and export demand price elasticities is greater than one. However, this approach relies on aggregate trade data. Bahmani and Ratha(2004) conducted a literature review on the J-curve phenomenon. Their review unveiled that empirical studies on the J-curve could be categorized into two groups: those that dealt with aggregate data (between one country and the world) and those that dealt with bilateral data (a country with its trading partners). Regardless of whether the models and data were aggregated or bilateral, there was a consensus that the short-term response to currency devaluation needed to follow an identifiable pattern regarding a country's trade balance. However, in the long run, there was more supporting evidence between exchange rates and trade balance in bilateral studies. This study aims to augment the existing knowledge base by investigating the J-curve effect within the framework of Vietnam and its primary trade partners, a subject of considerable interest in global economics.

There have been limited studies on the J-curve effect in Vietnam. In 2017, Thom X.T. utilized a bivariate VAR system and impulse response function analysis with bilateral data on 11 trading partners. Her study suggests that the trade balance shape follows an S rather than a J curve. In the same year, My, Sayim, and Rahman used the ARDL model approach and impulse response function to analyze 20 trading partners. Their findings indicated that the devaluation of the Vietnamese Dong did not improve the trade balance, suggesting that the J-curve effect does not hold. In 2018, Phong, Bao, and Van utilized an ARDL that included the impulse response function and found no evidence of a J-curve phenomenon between Vietnam and its trading partners. They recognized that treating Vietnam's main trading partners as an aggregate resulted in the inability to find the J-curve phenomenon. These studies so far have not found evidence of a J-curve, underscoring the unique and significant contribution of my research in this area. This study aims to fill this gap by comprehensively analyzing the J-curve phenomenon in the context of Vietnam and its major trading partners. It offers new insights and perspectives that could reshape the understanding of Vietnam's trade dynamics.

This paper provides a compelling analysis of Vietnam's trade balance with its 11 major trading partners: Australia, China, Hong Kong (China), India, Indonesia, Japan, Malaysia, Singapore, Thailand, and the United States. As illustrated in Table 1, these countries represent over 63% of Vietnam's total trade, making them vital to the nation's economic growth and stability. Understanding the complexities of Vietnam's trade balance with these partners is not just important—it is essential for policymakers and stakeholders. This study takes a robust approach by utilizing bilateral data and applying bounds-testing methods for cointegration and error correction modeling. The paper is thoughtfully structured into four main sections: models, methodology, results, and a summary, ensuring clarity and coherence. Additionally, an appendix offers a detailed definition of variables and data sources, enhancing the reliability of the analysis.

The Models and Methods

Using quarterly data from 2000QI-2023II, this paper's methodology employs error correction and cointegration structures to analyze the trade balance between Vietnam and 11 of its trading partners. The accepted fundamentals[1] are (i) a country's trade balance with its trading partners is influenced by its economic growth at home, (ii) the economic growth of its trading partners, and (iii) the real bilateral exchange rate[2]. Following their techniques[3], this model is specified as follows:

$$Ln\,TB_{i,t} = \alpha + \beta lnV_{i,t} + \delta\, Y_{i,t} + \eta REX_{i,t} + \theta\varepsilon_t \quad (1)$$

Vietnam's trade balance (import/export) with its trading partners *i* (the bilateral trade balance) is represented by TB[4]. Vietnam's economic activity (V_i), trading partners' economic activity (Yi), and real exchange rate (REX_i) are the primary factors that influence TB. If the bilateral trade balance is positive, the coefficient associated with the real bilateral exchange rate (REX_i) indicates an improvement in the bilateral trade balance. This is because REX_i is defined

[1] Refer to Rose and Yellen (1989) for the hypothetical explanation.
[2] Refer to Appendix.
[3] Several studies have applied a similar model, including Bahmani-Oskooee and Brooks (1999), Lal and Lowinger (2002), Onafowora (2003), Bahmani-Oskooee and Harvey (2012), and Harvey (2019).
[4] The trade balance unit, a crucial metric used to assess the equilibrium between a country's imports and exports, is measured using a ratio. This method, as advocated by Bahmani-Oskooee (1991), provides a comprehensive view of a country's trade position. For a detailed derivation of the reduced form, please refer to Rose and Yellen (1989, pp. 54–55).

so that a reduction in its value reflects a real depreciation of the VND against the partner's currency, as shown in the Appendix. Imports are expected to increase with economic growth in Vietnam, leading to a positive correlation between V_i and TB. According to Bahmani-Oskooee (1986), if Vietnam's increase in income (Yv) is caused by the rise in the production of goods that can substitute imports, then Vietnam may import less as its income rises. This could lead to a negative correlation between Vietnam's income and the trade balance. Similarly, δ may be positive or negative. Equation (1) only provides long-run coefficient estimates, regardless of how it is estimated. However, as the J-curve is a short-run phenomenon, this paper must include the short-run dynamic adjustment mechanism in equation (1) to investigate the short-run. To accomplish this, this paper will combine equation (1) with an error-correction model (2), which was introduced by Pesaran et al. (2001)[5].

$$\Delta TB_{i,t} = \sigma' + \sum_{k=1}^{n} \beta_k' \Delta LnTB_{i,t-k} + \sum_{k=0}^{n} \gamma_k' \Delta LnV_{it-,k} + \sum_{k=0}^{n} \pi_k' \Delta LnY_{i,t-k} + \sum_{k=0}^{n} \eta_k' \Delta LnREX_{i,t-k} + \chi_1 LnTB_{i,t-1} + \chi_2 LnV_{i,t-1} + \chi_3 LnY_{i,t-1} + \chi_4 LnREX_{i,t-1} + \phi \qquad (2)$$

Equation (2), both long and short runs, are completed in one stage using the OLS method. Additionally, (2) short-run effects of REX are observed via η' while the forecast of $\chi2$ discerns estimates of the long run - χ_4- normalized on χ_1[6]. The J-curve effect is observed when estimates of η' are negative at lower lags and positive at higher lags. Pesaran, Shin, and Smith (2011) suggest using their critical F-test to confirm cointegration in the model. They provide upper and lower-bound critical values for assessing the joint significance of lagged-level variables indicative of cointegration. Their critical F-test has a unique integrating property, making pre-unit-root testing unnecessary. In addition, they recommend using OLS to estimate both short-run and long-run effects simultaneously.

The results

This paper presents a linear model for Vietnam and its 11 trading partners. The empirical analysis focuses on quarterly data from 2000QI to 2023II, with a maximum of four lags on each first-differenced variable. Akaike's Information Criterion (AIC) selects the best model. Dummy variables are included in the model to account for the Global Financial Crisis of 2008 and the Coronavirus disease (COVID-19) pandemic in 2020. The results from each table are identified as ARDL (linear models), including diagnostic tests (Panel C).

Based on the short-run real bilateral exchange rates (Table 2), Australia, China Mainland, Japan, China, Hong Kong, Indonesia, India, Malaysia, New Zealand, Singapore, Thailand, and the USA, with at least the lagged coefficient, is significant. It should be noted that in the short term, fluctuations in the trade balance can go both ways. However, when the real exchange rate coefficients shift from negative to positive, it supports the J-curve. This phenomenon was observed in three cases: China, India, and Malaysia. In addition, Table 1, panel B, shows that the real bilateral exchange rate carries a positive coefficient with significant results in Australia,

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[5] In 2001, Pesaran, Shin, and Smith provided new critical values for the F test that consider integrating properties of variables. This approach allows for variables to be a combination of I(0) and I(1), offering the advantage of estimating both short-run and long-run effects in one step using OLS (2). Moreover, these variables are I (0) or I (I), which matches macroeconomic variables. Pesaran et al. (2001) upper bound matches Banerjee et al. (1998) values for a large sample. Due to a smaller sample, this study will use values from Banerjee et al. (1998).

[6] In addition, χ_1 measures the adjustment speed in each model and must be negative.

Japan, India, Indonesia, and Thailand. By adopting the newly proposed definition of the J-curve by Rose and Yellen (1989), which denotes a short-term decline followed by long-term improvement, the manifestation of this curve is evident in the outcomes for Australia, Japan, and Thailand. From the long-run results, this paper gathers that the level of economic activity in Vietnam and its trading partners are significant determinants of trade balance in 50% of the cases.

As for the long-run effects of income variables, Vietnam's income is positive and significant in five linear models. Vietnam's trading partners' income carries significant negative coefficients in most models. The negative and significant coefficient obtained for EC_{t-1} indicates that the adjustment is towards equilibrium. Additionally, as Bahmani-Oskooee and Ardalani (2006) suggested, the negative and significant coefficient of EC_{t-1} could indicate cointegration among the variables. The results reported in Table 1, panel C, clearly support all cases' adjustment toward equilibrium and cointegration.

In Panel C, review the diagnostic statistics for all models. All Lagrange Multiplier statistics (LM) show no evidence of serial correlation. In addition, Ramsey's RESET test demonstrates that most of these models are correctly specified. CUSUM and CUSUMSQ tests were identified as CS and CS2 in Panel C to determine the stability of all estimated coefficients. Following Bahmani-Oskooee and Goswami (2003), this research applies the CUSUM and CUSUMSQ tests to Equation (2) residuals. The cumulative sum (CUSUM) test plots the recursive residuals against the breakpoints. The CUSUM of squares test (CUSUMSQ) involves plotting the squared recursive residuals against the breakpoints. These two statistics are then depicted within two straight lines bounded by a 5% significance level. The null hypothesis of stable parameters is rejected if any point lies beyond this 5% level. Bahmani-Oskooee and Goswami (2003)argue that cointegration does not imply stability. As such, CUSUM and CUSUMSQ tests are applied to identify stability. Overall, most estimates are stable. They finally adjusted R^2 to consider goodness of fit.

Summary and Conclusion

Policymakers and economists often highlight the impact of currency depreciations or appreciations on trade balance outcomes. As a result, countries adopt different exchange rate regimes to gain a trade balance advantage. Studies on the relationship between exchange rates and trade balance have evolved. Early studies focused on aggregate trade data but have shifted toward bilateral data. However, both approaches still suffer from an aggregation bias.

The paper uses quarterly data to assess Vietnam's trade balance with 11 trading partners, with China and the United States being the most significant trading partners. Figure 1 illustrates that Vietnam's nominal exchange rate has continuously depreciated since 2000. However, does this provide an advantage for its trade balance? Few studies have been conducted on the J-curve effect in Vietnam. These studies used aggregate data and found no evidence of J-curve. This may be due to the aggregation bias. As such, this paper uses disaggregated data and a bound testing approach to cointegration and error-correction modeling to find three cases of the J-curve phenomenon: China, Indonesia, and Malaysia. Yet, suppose one supports the updated interpretation of the J-curve proposed by Rose and Yellen (1989), which indicates an initial short-term decline followed by long-term recovery. In that case, this pattern is apparent in the outcomes for Australia, Japan, and Thailand. Evidence shows that Vietnam's VND depreciation contributes to its trade balance improvement in both the short and long run. Moreover, evidence indicates that the linear model supports the J-curve effects. However, the long-run results revealed improvement in Vietnam's bilateral trade balance, at least in four cases. Furthermore, in three of these cases, the new definition of the J-curve received empirical support. In the case of the USA, one of Vietnam's major trading partners, there is no evidence of a J-curve effect. Future research could benefit from using disaggregated data at the bilateral level, specifically in the case of Vietnam and the USA, at the industry level for a more detailed examination.

The policy implications underscore Vietnam's need to expand its export markets to mitigate potential economic disruptions in specific countries. The United States, Japan, and China serve as the primary markets for Vietnamese exports. Therefore, any economic downturn in these countries could adversely affect the demand for Vietnamese products. Policymakers should carefully consider Vietnam's inflation rate and that of its trading partners before adjusting to the nominal exchange rate to improve the trade balance through the relative price channel. However, it is essential to note that the relative price is directly linked to the real exchange rate rather than the nominal one. Considering the inflation and nominal exchange rates of different countries and currencies will enable the prediction of the real effective exchange rate trend and prevent unexpected movements that could negatively impact the trade balance. Decreasing government intervention in the foreign exchange market can enhance the flexibility of exchange rates. Embracing a more flexible exchange rate system could significantly strengthen the country's foreign exchange reserves.

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APPENDIX

Data Definition and Sources

Quarterly data over the period 2000QI-2023II are used to conduct the empirical analysis.
Data:

a. IMF e-Library – DATA:
   i. Direction of Trade Statistics (DOT)
   ii. International Financial Statistics (IFS)
b. Global Financial Data

Variables

TB_i = Vietnam trade balance with partner i is defined as Vietnam's imports from partner i over her exports to partner i. The data come from source a(i)

V = Measure of Vietnam's income. It is proxied by the index of real GDP. The data comes from sources a and b.

Y_i = the income of the trading partner, i. The country's index of real GDP also proxies this, and the data come from sources a and b.

REX_i = The real bilateral exchange rate of the Vietnamese Dong against partner i's currency is defined as REXi = (PVT.NEXi / Pi), where NEXi is the nominal exchange rate, PVT is the price level in Vietnam (measured by CPI), and Pi is the price level in country i (also measured by CPI). A decrease in REX indicates a real depreciation of the Vietnamese Dong. All data comes from source a.

Note:

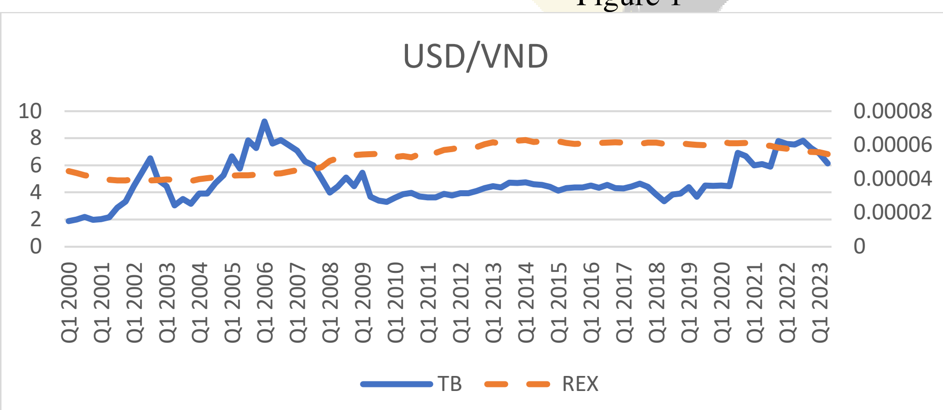
Dummy1: Global Financial Crisis, 2018

Dummy2: Coronavirus disease (COVID-19) pandemic, 2020.

<u>Countries:</u>

Australia, China, Hong Kong, China, Mainland, India, Indonesia, Japan, Malaysia, New Zealand, Singapore, Thailand, United States

Figure 1



1. Source: IMF, International Financial Statistics (IFS)
2. Figure 1 plots the trade balance (TB) and real bilateral exchange rate (REX) between Vietnam and China Mainland.
   - TB defined Vietnam's exports over its imports with China, Mainland. Thus, an increase in TB reflects an improvement.
   - REX as defined in the appendix.

Table 1

Trading partners	**Total exports**	**Total imports**	**Trade balance**	**% of total Trade**
Australia	6015	10125	-4110	2.26%
China, Mainland	58465	117700	-59235	24.63%
China, Hong Kong	10908	1907	9001	1.79%
India	7869	7094	775	2.09%
Indonesia	4555	9599	-5044	1.98%
Japan	24037	23312	725	6.62%
Malaysia	5481	9086	-3605	2.04%
Vietnam	697	714	-17	0.20%
Singapore	4328	4817	-489	1.28%
Thailand	7029	14050	-7021	2.95%
United States	109111	14439	94672	17.28%
*Total**	**$364262**	**$350869**	$13393	100.00%

Source: As of 2022 *Inclusive smaller trading partners (Millions USD)

	Table 2: Full-Information Estimates of Linear ARDL (L-ARDL)						
	i = Australia	**i = China**	**i = Japan**	**i=Hong Kong**	**i = Indonesia ,#**	**i =India##**	**i=Malaysia#**
$\mathbf{\Delta lnTB_{i,t-1}}$	0.87*	0.67*	0.34*	0.58*	0.68*	0.67*	0.55*
$\Delta lnTB_{i,t-2}$	-0.004	0.09	0.40*	0.28*	0.25**	0.19	0.37*
$\Delta lnTB_{i,t-3}$	-0.16	0.001	-0.33*		-0.46*	-0.32*	0.03
$\Delta lnTB_{i,t-4}$		0.23*			0.29*		0.14
$\mathbf{\Delta ln\ V_{,t}}$	-1.99*	0.59	0.08	0.21	-0.69	0.57	0.87
$\Delta lnV_{,t-1}$	2.07*	-0.28		2.08*	-0.63	0.11	-0.52
$\Delta lnV_{,t-2}$	1.29	1.32**		-1.69*	2.31*	1.35	0.47
$\Delta lnV_{,t-3}$	-2.57*	-1.48*			-1.05		1.54**
$\Delta lnV_{,t-4}$	1.16*				-0.36		-1.98*
$\mathbf{\Delta lnY_{i,t}}$	0.41	1.12	0.20	2.17*	-2.36	-1.02*	-0.94**
$\Delta lnY_{i,t-1}$	-0.54	-1.15	-1.17**	-0.87	2.56		-0.07
$\Delta lnY_{i,t-2}$	1.01*			1.19**			0.42
$\Delta lnY_{i,t-3}$				-1.35*			-1.23
$\Delta lnY_{i,t-4}$				-1.70*			2.14*
$\mathbf{\Delta lnREX_{i,t}}$	-0.25	-0.48	-0.39**	1.69**	0.06	-0.43	-1.12*
$\Delta lnREX_{i,t-1}$	0.76*	-1.08	0.31	0.13	-0.28	1.15*	0.69**
$\Delta lnREX_{i,t-2}$	-0.76*	1.36*	-0.28	-1.94*			
$\Delta lnREX_{i,t-3}$	0.69*		-0.03				

$\Delta \ln REX_{i,t-4}$			0.58*				
	Panel B: Long–Run Estimates						
ln Vi	-0.18	45.99	0.14	4.08**	2.37*	1.96*	1.79*
ln Y_i	2.98*	-9.23	-1.64*	-3.81	0.61*	-2.22*	1.43
ln REX_i	1.47*	-63.71	0.29*	-0.77	0.99**	1.57*	-1.93
Constant	-6.85	-1317.07	29.19	-60.94**	-61.99*	6.33	-64.44*
	Panel C: Diagnostic Statistics						
F	4.37*	1.09	9.09*	6.29*	5.98*	7.73*	5.52*
ECM_{t-1}	-0.29*	-0.003*	-0.59*	-0.14*	-0.39*	-0.45*	-0.22*
LM	0.05	1.62	0.02	0.12	1.19	1.90	0.18
RESET	0.09	0.00	1.23	0.08	0.60	0.48	0.93
Adjusted R^2	0.97	0.83	0.54	0.98	0.85	0.97	0.82
CS (CS^2)	S(S)	S(S)_	S(S)	S(US)	S(S)	S(US)	S(US)

Notes: See notes at the end.

Table 2: Full-Information Estimates of Linear ARDL (L-ARDL)				
	i =New Zealand	**i =Singapore,##**	**i=Thailand,##**	**i = USA,#**
$\Delta \ln TB_{i,t-1}$	0.79*	0.64*	0.64*	0.83*
$\Delta \ln TB_{i,t-2}$	-0.00	0.21*	0.52*	0.36*
$\Delta \ln TB_{i,t-3}$	-0.20**		-0.42*	-0.43*
$\Delta \ln TB_{i,t-4}$				
$\Delta \ln V_{,t}$	-1.69*	0.12	0.53*	0.27
$\Delta \ln V_{,t-1}$	1.90*			0.18
$\Delta \ln V_{,t-2}$				1.44*
$\Delta \ln V_{,t-3}$				-1.76*
$\Delta \ln V_{,t-4}$				
$\Delta \ln Y_{i,t}$	-1.13*	0.13	-0.46*	-3.31*
$\Delta \ln Y_{i,t-1}$				4.21*
$\Delta \ln Y_{i,t-2}$				-1.68
$\Delta \ln Y_{i,t-3}$				
$\Delta \ln Y_{i,t-4}$				
$\Delta \ln REX_{i,t}$	0.12	0.45*	0.45*	0.56
$\Delta \ln REX_{i,t-1}$		1.04**		
$\Delta \ln REX_{i,t-2}$		-1.54*		
$\Delta \ln REX_{i,t-3}$		0.73		
$\Delta \ln REX_{i,t-4}$				
Panel B: Long–Run Estimate				
ln V	0.53	0.79	2.08*	-0.54
ln Y_i	-2.76*	0.87	-1.81*	-3.32*
ln REX_i	0.29	-6.43**	1.78*	2.38

Constant	22.16*	-86.80	-0.38	61.29*
Panel C: Diagnostic Statistics				
F	5.13*	1.76	3.91**	5.12*
ECM_{t-1}	-0.41*	-0.15*	-0.25*	-0.24*
LM	0.32	0.91	0.03	0.62
RESET	4.92*	0.04	0.39	0.002
Adjusted R^2	0.90	0.88	0.84	0.87
CS (CS^2)	S(S)	S(S)	S(US)	S(S)

Notes: See notes at the end.

Notes:

a. The numbers inside the parentheses next to coefficient estimates are the absolute values of t-ratios. "*" and "**" indicate significance at the 10% and 5%, respectively.
b. The upper bound critical value of the F-test for cointegration when there are three exogenous variables is 3.77 (4.35) at the 10% (5%) significance level; Pesaran et al. (2001, Table CI, Case III, p. 300).
c. The critical value for the significance of ECMt-1 at the 10% (5%) level when k = 3 is -3.47 (-3.82). The comparable figures when k = 4 are -3.67 and -4.03, respectively. These figures come from Banerjee et al. (1998, Table 1).
d. The Lagrange Multiplier (LM) test of residual serial correlation has a critical value of 2.71 (3.84) at a 5% (10%) significance level.
e. RESET is Ramsey's test for misspecification. The value is distributed as χ^2 with one degree of freedom. The critical value is 3.84 at the 5% level and 2.70 at the 10% level.
f. The symbol "#" shows that the dummy is significant. Dummy1 #: Global Financial Crisis, 2018; Dummy2##: Coronavirus disease (COVID-19) pandemic, 2020.
g. Wald tests are distributed as $\chi 2$ with 1 degree of freedom. The critical value is 2.71 (3.84) at the 10% (5%) significance level.