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An Analysis of the Impact of Exchange Rate on Trade of BIMSTEC Countries

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Abstract
Purpose: This paper aims to explore the impact and long-term shocks of exchange rates on import and export of the BIMSTEC Countries.
Methodology: The study uses quarterly data from 2011-2022 on trade and exchange rates in BIMSTEC countries from various sources and employs tests like VAR Granger Causality Test, Regression Analysis and ARDL Cointegration.
Findings: The study analysed the impact of import and export grangers on the exchange rate in Bangladesh, India, Bhutan, Nepal, and Myanmar. It found that import and export grangers cause the exchange rate, while only export grangers significantly impact the exchange rate on export. In contrast, Nepal, Sri Lanka, and Thailand do not have granger causality between import, export, and exchange rate. The ARDL model revealed that for India, Bangladesh, Bhutan, and Nepal, cointegration exists, while for Myanmar and Thailand, cointegration does not exist. In Sri Lanka, the ARDL model becomes inconclusive.
Originality: The study explores the area of Exchange Rate and Trade which are the major economic factors for BIMSTEC countries, paving the way for further research on other countries with different time periods and economic growth factors.

Keywords: *Import, Export, BIMSTEC Countries, Exchange Rate, Trade*

1. Introduction

With an emphasis on seven member nations, the study looks at exchange rate changes within the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC). The acronym BIST-EC stood for Bangladesh, India, Sri Lanka, and Thailand Economic Cooperation. SAARC, which was founded in 1985 by Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka, and BIMSTEC, which was founded in 1997 by five South Asian countries and two ASEAN countries, adopted these acronyms, which consists of Bangladesh, India, Bhutan, Nepal, Sri Lanka, Myanmar and Thailand. The paper looks at trends in exchange rates and their effect on factors including; debt service, FDI, tourist arrivals, inflation, trade balance and remittances. It postulates that a depreciating national currency can make export-dependent countries' balance of trade beneficial by reducing the cost of imports and boosting exports for exports. Foreign exchange also influences export profitability, import demands and capacities, its competitiveness, and the economy in general. Higher exchange rate preferred will enhance demand and, in turn, enhance income while higher exchange rate at home hampers exports by raising prices and perhaps lower export quantities. The paper stresses the issue of exchange rate risk for and, therefore, its effect on the businesses and policy makers.

2. Literature Review

Sugiharti *et.al* (2020) studied that the exchange rate volatility significantly impacts exports of commodities to India, Japan, South Korea, and the US, with negative effects on plastics goods and a strong long-term effect on Asian countries. **Thuy and Thuy (2019)** identified that exchange rate volatility negatively impacts long-term export volume, while depreciation of domestic currency negatively impacts short-term exports but positively in long run, despite foreign country real income increase. **Raphael *et.al* (2016)** studied that depreciations are more strongly passed through than appreciations in long-run economies, suggesting exporters may exert long-run pricing power, with asymmetry stronger in import-dependent economies. **Choudhri and Hakura (2015)** observed that the exchange rate pass-through to import prices for numerous countries is incomplete and larger than the pass-through to export prices.
However, **Khan and Ismail (2014)** found that trade and government intervention, foreign remittances, and transactions with the IMF and USAID may significantly affect exchange rate variability in Pakistan in recent years. **Adeniran *et.al* (2014)** found that developing countries benefit from flexible exchange rate regimes, while interest rates and inflation negatively impact economic growth. **Cheung and Sengupta (2013)** found that Currency appreciation and volatility negatively impact Indian firms' export shares, with labour costs intensifying trade effects due to which smaller firms respond asymmetrically, with services being more affected.

3. Research Objectives

The objectives taken for the study:

1. To examine the relationship of exchange rate and foreign trade;
2. To analyse the impact of exchange rate on the foreign trade;
3. To analyse the influence of exchange rate shocks on foreign trade in long run

4. Research Methodology

The data of trade (Export and Import), Exchange Rates is taken on quarterly basis from 2011-2022 of the BIMSTEC Countries from sources like Trading Economics, CEIC Data and Investing.com. Test like Granger Causality Test using VAR, Autoregressive Distributed Lag [ARDL] Cointegration Long Run Test and Regression analysis using the software EViews.

5. Analysis and Interpretation

The analysis starting from VAR Granger Causality followed by Regression and ARDL Model.

- **VAR Granger Causality**

We investigate that if Exchange rate has a significant relationship on Foreign Trade, for which VAR Granger Causality Test had been conducted. For our research we conducted a study on BIMSTEC countries.

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 02/25/24 Time: 10:30
Sample: 2011Q1 2022Q4
Included observations: 46

Dependent variable: _1$_BDT

Excluded	Chi-sq	df	Prob.
BAN_IMPORT	5.854188	2	0.0536
BAN_EXPORT	0.302578	2	0.8596
All	19.67543	4	0.0006

Dependent variable: BAN_IMPORT

Excluded	Chi-sq	df	Prob.
_1$_BDT	3.724843	2	0.1553
BAN_EXPORT	0.032583	2	0.9838
All	4.067365	4	0.3970

Dependent variable: BAN_EXPORT

Excluded	Chi-sq	df	Prob.
_1$_BDT	2.665563	2	0.2637
BAN_IMPORT	4.459698	2	0.1075
All	6.697887	4	0.1527

[Table 1: VAR Granger Causality Test of Bangladesh through EVIEWS]

For **Bangladesh's** point of view, Import does granger cause Exchange Rate of 1$ to BDT since P-value is equal to 0.05. Export doesn't granger cause Exchange Rate of 1$ to BDT since P-value is greater than 0.05. All the independent variables when put together can granger cause Exchange Rate of 1$ to BDT.
Exchange Rate of 1$ to BDT, Export and all doesn't granger cause Import since P-value is greater than 0.05.
Exchange Rate of 1$ to BDT, Import and all doesn't granger cause Export since P-value is greater than 0.05.

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 02/25/24 Time: 10:32
Sample: 2011Q1 2022Q4
Included observations: 46

Dependent variable: _1$_INR

Excluded	Chi-sq	df	Prob.
IND_EXPORT	0.252896	2	0.8812
IND_IMPORT	0.857984	2	0.6512
All	8.545265	4	0.0735

Dependent variable: IND_EXPORT

Excluded	Chi-sq	df	Prob.
_1$_INR	1.272923	2	0.5292
IND_IMPORT	1.393422	2	0.4982
All	3.297601	4	0.5093

Dependent variable: IND_IMPORT

Excluded	Chi-sq	df	Prob.
_1$_INR	0.160146	2	0.9230
IND_EXPORT	6.710594	2	0.0349
All	8.833886	4	0.0654

[Table 2: VAR Granger Causality Test of India through EVIEWS]

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For **India's** point of view, Import, Export and all doesn't granger cause Exchange Rate of 1$ to INR since P-value is greater than 0.05.
Exchange Rate of 1$ to INR, Import and all doesn't granger cause Export since P-value is greater than 0.05.
Exchange Rate of 1$ to INR doesn't granger cause Import since P-value is greater than 0.05. Export does granger cause Import since P-value is less than 0.05. All the independent variables when put together can't granger cause Import.

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 02/25/24 Time: 10:33
Sample: 2011Q1 2022Q4
Included observations: 46

Dependent variable: _1$_BTN

Excluded	Chi-sq	df	Prob.
BHUT_EXPORT	2.226208	2	0.3285
BHUT_IMPORT	8.030824	2	0.0180
All	10.22691	4	0.0368

Dependent variable: BHUT_EXPORT

Excluded	Chi-sq	df	Prob.
_1$_BTN	7.633148	2	0.0220
BHUT_IMPORT	5.214180	2	0.0737
All	25.28632	4	0.0000

Dependent variable: BHUT_IMPORT

Excluded	Chi-sq	df	Prob.
_1$_BTN	1.721133	2	0.4229
BHUT_EXPORT	3.536503	2	0.1706
All	9.494212	4	0.0499

[Table 3: VAR Granger Causality Test of Bhutan through EVIEWS]

For **Bhutan's** point of view, Export doesn't granger cause Exchange Rate of 1$ to BTN since P-value is greater than 0.05. Import does granger cause Exchange Rate of 1$ to BTN since P-value is less than 0.05. All the independent variables when put together can granger cause Exchange Rate of 1$ to BTN.
Import doesn't granger cause Export since P-value is greater than 0.05. Exchange Rate of 1$ to BTN does granger cause Export since P-value is less than 0.05. All the independent variables when put together can granger cause Export.
Exchange Rate of 1$ to BTN, Export and all doesn't granger cause Import since P-value is greater than 0.05. All the independent variables when put together can granger cause Import.

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 02/25/24 Time: 10:50
Sample: 2011Q1 2022Q4
Included observations: 46

Dependent variable: _1$_MMK

Excluded	Chi-sq	df	Prob.
MYAN_EXPORT	1.594207	2	0.4506
MYAN_IMPORT	1.568469	2	0.4565
All	2.477358	4	0.6487

Dependent variable: MYAN_EXPORT

Excluded	Chi-sq	df	Prob.
_1$_MMK	3.749751	2	0.1534
MYAN_IMPORT	3.966169	2	0.1376
All	8.585684	4	0.0723

Dependent variable: MYAN_IMPORT

Excluded	Chi-sq	df	Prob.
_1$_MMK	7.217346	2	0.0271
MYAN_EXPORT	1.598139	2	0.4497
All	11.76603	4	0.0192

[Table 4: VAR Granger Causality Test of Myanmar through EVIEWS]

For **Myanmar's** point of view, Import, Export and all doesn't granger cause Exchange Rate of 1$ to MMK since P-value is greater than 0.05.
Exchange Rate of 1$ to MMK, Export and all doesn't granger cause Import since P-value is greater than 0.05.
Exchange Rate of 1$ to MMK does granger cause Import since P-value is less than 0.05. Export doesn't granger cause Import since P-value is greater than 0.05. All the independent variables when put together can granger cause Import.

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 02/25/24 Time: 10:55
Sample: 2011Q1 2022Q4
Included observations: 46

Dependent variable: _1$_NPR

Excluded	Chi-sq	df	Prob.
NEP_EXPORT	0.019198	2	0.9904
NEP_IMPORT	3.839934	2	0.1466
All	6.577268	4	0.1600

Dependent variable: NEP_EXPORT

Excluded	Chi-sq	df	Prob.
_1$_NPR	0.040682	2	0.9799
NEP_IMPORT	1.014939	2	0.6020
All	2.259885	4	0.6881

Dependent variable: NEP_IMPORT

Excluded	Chi-sq	df	Prob.
_1$_NPR	3.479003	2	0.1756
NEP_EXPORT	1.276212	2	0.5283
All	6.040294	4	0.1962

[Table 5: VAR Granger Causality Test of Nepal through EVIEWS]

For **Nepal's** point of view, Import, Export and all doesn't granger cause Exchange Rate of 1$ to NPR since P-value is greater than 0.05.
Exchange Rate of 1$ to NPR, Import and all doesn't granger cause Export since P-value is greater than 0.05.
Exchange Rate of 1$ to NPR, Export and all doesn't granger cause Import since P-value is greater than 0.05.

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 02/25/24 Time: 10:41
Sample: 2011Q1 2022Q4
Included observations: 46

Dependent variable: _1$_LKR

Excluded	Chi-sq	df	Prob.
SL_EXPORT	2.128671	2	0.3450
SL_IMPORT	1.055637	2	0.5899
All	8.745254	4	0.0678

Dependent variable: SL_EXPORT

Excluded	Chi-sq	df	Prob.
_1$_LKR	2.883941	2	0.2365
SL_IMPORT	0.578626	2	0.7488
All	3.974904	4	0.4094

Dependent variable: SL_IMPORT

Excluded	Chi-sq	df	Prob.
_1$_LKR	1.447977	2	0.4848
SL_EXPORT	0.842320	2	0.6563
All	1.988992	4	0.7378

[Table 6: VAR Granger Causality Test of Sri Lanka through EVIEWS]

For **Sri Lanka's** point of view, Import, Export and all doesn't granger cause Exchange Rate of 1$ to LKR since P-value is greater than 0.05.
Exchange Rate of 1$ to LKR, Import and all doesn't granger cause Export since P-value is greater than 0.05.
Exchange Rate of 1$ to LKR, Export and all doesn't granger cause Import since P-value is greater than 0.05.

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 02/25/24 Time: 10:58
Sample: 2011Q1 2022Q4
Included observations: 46

Dependent variable: _1$_THB

Excluded	Chi-sq	df	Prob.
THAI_EXPORT	0.184211	2	0.9120
THAI_IMPORT	0.892136	2	0.6401
All	4.406257	4	0.3538

Dependent variable: THAI_EXPORT

Excluded	Chi-sq	df	Prob.
_1$_THB	1.169704	2	0.5572
THAI_IMPORT	4.987259	2	0.0826
All	8.248082	4	0.0829

Dependent variable: THAI_IMPORT

Excluded	Chi-sq	df	Prob.
_1$_THB	4.019233	2	0.1340
THAI_EXPORT	4.329255	2	0.1148
All	8.055513	4	0.0896

[Table 7: VAR Granger Causality Test of Thailand through EVIEWS]

For **Thailand's** point of view, Import, Export and all doesn't granger cause Exchange Rate of 1$ to THB since P-value is greater than 0.05.
Exchange Rate of 1$ to THB, Import and all doesn't granger cause Export since P-value is greater than 0.05.
Exchange Rate of 1$ to THB, Export and all doesn't granger cause Import since P-value is greater than 0.05.

Regression Analysis

Now to find the impact of exchange rate on the trade, regression had been conducted.
H_0: There is a no significant impact of exchange rate of a country.

Bangladesh:

Dependent Variable: _1$_BDT
Method: Least Squares
Date: 02/21/24 Time: 23:31
Sample: 2011Q1 2022Q4
Included observations: 48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BAN_EXPORT	3.121283	2.248924	1.387901	0.1720
BAN_IMPORT	1.590511	1.165603	1.364540	0.1792
C	66.90084	2.238084	29.89202	0.0000

R-squared	0.585354	Mean dependent var	81.51243
Adjusted R-squared	0.566925	S.D. dependent var	4.832799
S.E. of regression	3.180388	Akaike info criterion	5.212345
Sum squared resid	455.1692	Schwarz criterion	5.329295
Log likelihood	-122.0963	Hannan-Quinn criter.	5.256541
F-statistic	31.76314	Durbin-Watson stat	0.499367
Prob(F-statistic)	0.000000		

[Table 8: Regression Analysis of Bangladesh through EVIEWS]

The exchange rate of 1$ to BDT, Import and Export have a moderate association, as seen by the value of R^2= 58.53%. The F ratio is 31.763 and the p-value of Export and Import to the exchange rate of 1$ to BDT is more than 0.05, which is 0.172 and 0.179 respectively. Since the p-value is above the acceptable significance level, the model is therefore not significant. The variation in the exchange rate of 1$ to BDT has no appreciable effect on the Trade. The H_0 hypothesis is thus accepted.

Bhutan:

Dependent Variable: _1$_BTN
Method: Least Squares
Date: 02/25/24 Time: 10:07
Sample: 2011Q1 2022Q4
Included observations: 48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BHUT_EXPORT	74.04887	24.52096	3.019819	0.0042
BHUT_IMPORT	73.92967	18.31242	4.037133	0.0002
C	40.64245	3.863670	10.51913	0.0000

R-squared	0.488589	Mean dependent var	65.07671
Adjusted R-squared	0.465860	S.D. dependent var	9.088461
S.E. of regression	6.642292	Akaike info criterion	6.685253
Sum squared resid	1985.402	Schwarz criterion	6.802203
Log likelihood	-157.4461	Hannan-Quinn criter.	6.729448
F-statistic	21.49594	Durbin-Watson stat	0.509609
Prob(F-statistic)	0.000000		

[Table 9: Regression Analysis of Bhutan through EVIEWS]

The study found a moderate correlation between the Exchange rate of 1$ to BTN and trade, with a R^2=48.86% value. The P-values for Export and Import were less than 0.05, indicating significant adjustment due to trade. The exchange rate of 1$ to BTN in Bangladesh increased by 74.05% for every 1% increase in export and 73.93% for every 1% increase in import, rejecting the H_0 theory and indicating a significant positive relationship between Exchange rate and Trade.

India:

Dependent Variable: _1$_INR
Method: Least Squares
Date: 02/25/24 Time: 10:05
Sample: 2011Q1 2022Q4
Included observations: 48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IND_EXPORT	1.820613	0.672483	2.707301	0.0096
IND_IMPORT	-0.594608	0.371447	-1.600789	0.1164
C	40.27426	7.194494	5.597928	0.0000

R-squared	0.221947	Mean dependent var	65.11181
Adjusted R-squared	0.187367	S.D. dependent var	9.071524
S.E. of regression	8.177633	Akaike info criterion	7.101144
Sum squared resid	3009.316	Schwarz criterion	7.218094
Log likelihood	-167.4275	Hannan-Quinn criter.	7.145340
F-statistic	6.418329	Durbin-Watson stat	0.257817
Prob(F-statistic)	0.003529		

[Table 10: Regression Analysis of India through EVIEWS]

The value of R^2=22.19%, indicating a moderate degree of correlation between the Exchange rate of 1$ to INR and Trade. P-value of both Export is less than 0.05, which is 0.01 and the p-value of Import is greater than 0.05, which is 0.116, and the F ratio is 21.49. The p-value of Export is below the acceptable significance level while the p-value of Export is beyond the acceptable significance level, indicating that the result is significant for Export and insignificant for Import. Because the P-value of Export is less than the permissible value of 0.05, there has been a considerable adjustment in Exchange rate of 1$ to INR due to its trade. The Exchange rate of 1$ to INR rate of India will rise by 1.82% every 1% increase in Export. The H_0 theory is therefore rejected for Export and for Import it is accepted. As a result, the data points to a significant positive relationship between Exchange Rate and Export.

Myanmar:

Dependent Variable: _1$_MMK
Method: Least Squares
Date: 02/25/24 Time: 10:09
Sample: 2011Q1 2022Q4
Included observations: 48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MYAN_EXPORT	677.9307	225.6593	3.004222	0.0043
MYAN_IMPORT	665.2905	193.1608	3.444231	0.0012
C	-442.2431	207.2832	-2.133521	0.0384

R-squared	0.588387	Mean dependent var	1176.204
Adjusted R-squared	0.570093	S.D. dependent var	493.3136
S.E. of regression	323.4525	Akaike info criterion	14.45644
Sum squared resid	4707968.	Schwarz criterion	14.57339
Log likelihood	-343.9546	Hannan-Quinn criter.	14.50064
F-statistic	32.16293	Durbin-Watson stat	0.667746
Prob(F-statistic)	0.000000		

[Table 11: Regression Analysis of Myanmar through EVIEWS]

The value of R^2=58.84%, indicating a moderate degree of correlation between the Exchange rate of 1$ to MMK and Trade. The P-values for Export and Import were less than 0.05, indicating a significant adjustment due to trade. The Exchange rate of 1$ to MMK in Myanmar increased by 677.93% for every 1% increase in export and 665.29% for every 1% increase in import, rejecting the H_0 theory. The data indicates a significant positive relationship between Exchange Rate and Trade.

Nepal:

Dependent Variable: _1$_NPR
Method: Least Squares
Date: 02/25/24 Time: 10:11
Sample: 2011Q1 2022Q4
Included observations: 48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NEP_EXPORT	-147.6400	67.95019	-2.172769	0.0351
NEP_IMPORT	46.53085	6.130998	7.589442	0.0000
C	78.12969	4.652380	16.79349	0.0000

R-squared	0.604811	Mean dependent var	103.9504
Adjusted R-squared	0.587247	S.D. dependent var	14.56806
S.E. of regression	9.359367	Akaike info criterion	7.371094
Sum squared resid	3941.899	Schwarz criterion	7.488044
Log likelihood	-173.9063	Hannan-Quinn criter.	7.415290
F-statistic	34.43483	Durbin-Watson stat	0.509336
Prob(F-statistic)	0.000000		

[Table 12: Regression Analysis of Nepal through EVIEWS]

The value of R^2=60.48%, indicating a moderate degree of correlation between the Exchange rate of 1$ to NPR and Trade. The P-values for Export and Import were less than 0.05, indicating a significant adjustment in the Exchange rate of 1$ to NPR due to trade. The data showed that the Exchange rate of 1$ to NPR rate in Nepal decreases by 147.64% for every 1% increase in export and rises by 46.53% for every 1% increase in import, rejecting the H_0 theory and indicating a significant positive relationship between the Exchange rate and trade.

Sri Lanka:

Dependent Variable: _1$_LKR
Method: Least Squares
Date: 02/25/24 Time: 10:08
Sample: 2011Q1 2022Q4
Included observations: 48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SL_EXPORT	382.3999	55.74217	6.860154	0.0000
SL_IMPORT	-173.1404	35.10752	-4.931719	0.0000
C	90.33726	60.36661	1.496477	0.1415

R-squared	0.541132	Mean dependent var	164.7326
Adjusted R-squared	0.520738	S.D. dependent var	56.73624
S.E. of regression	39.27780	Akaike info criterion	10.23966
Sum squared resid	69423.56	Schwarz criterion	10.35661
Log likelihood	-242.7518	Hannan-Quinn criter.	10.28385
F-statistic	26.53369	Durbin-Watson stat	1.068899
Prob(F-statistic)	0.000000		

[Table 13: Regression Analysis of Sri Lanka through EVIEWS]

The value of R^2=54.11%, indicating a moderate degree of correlation between the Exchange rate of 1$ to LKR and Trade. The P-values for Export and Import were less than 0.05, indicating a significant adjustment in the exchange rate due to trade. The exchange rate of 1$ to LKR in Sri Lanka increased by 382.40% for every 1% increase in export and decreased by 173.14% for every 1% increase in import. Therefore, the H_0 theory is rejected, indicating a significant positive relationship between the exchange rate and trade.

Thailand:

Dependent Variable: _1$_THB
Method: Least Squares
Date: 02/25/24 Time: 10:12
Sample: 2011Q1 2022Q4
Included observations: 48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
THAI_EXPORT	0.528297	0.249577	2.116772	0.0398
THAI_IMPORT	-0.402116	0.185788	-2.164382	0.0358
C	29.90651	2.701020	11.07230	0.0000

R-squared	0.099412	Mean dependent var	32.48431
Adjusted R-squared	0.059385	S.D. dependent var	1.860507
S.E. of regression	1.804418	Akaike info criterion	4.078814
Sum squared resid	146.5165	Schwarz criterion	4.195764
Log likelihood	-94.89154	Hannan-Quinn criter.	4.123010
F-statistic	2.483664	Durbin-Watson stat	0.283552
Prob(F-statistic)	0.094808		

[Table 14: Regression Analysis of Thailand through EVIEWS]

The value of R^2=9.94%, indicating a low degree of correlation between the Exchange rate of 1$ to THB and Trade. The P-values for export and import were less than 0.05, indicating significant adjustments due to trade. The exchange rate of 1$ to THB in Thailand increased by 0.528% for every 1% increase in export and decreased by 0.402% for every 1% increase in import. Therefore, the H_0 theory is rejected, indicating a significant positive relationship between the exchange rate and trade.

- **Autoregressive Distributed Lag (ARDL) Model**

To apply Autoregressive Distributed Lag (ARDL) Model, the data needs to be stationary. To test the stationarity, Unit Root Test had been conducted.

After the Unit Root was conducted, it was found that the value of Exchange Rate from 1$ to domestic currencies, Export and Import for all the BIMSTEC countries, the data series was stationary in nature.

Now to analyse the influence of exchange rate shocks on foreign trade, Autoregressive Distributed Lag (ARDL) Model has been used.

Bangladesh:

H_0: There is no long run relationship and cointegration does not exist.

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic: n=1000		
F-statistic	8.008149	10%	2.63	3.35
k	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5
Actual Sample Size	46	Finite Sample: n=50		
		10%	2.788	3.513
		5%	3.368	4.178
		1%	4.695	5.758
		Finite Sample: n=45		
		10%	2.788	3.54
		5%	3.368	4.203
		1%	4.8	5.725

[Table 15: F-Bounds Test of Bangladesh through EVIEWS]

In long run form and bounds we found that in F-Bounds test the value of F-statistic is 8.008 which greater than I (1) value at 5% level of significance, the null hypothesis gets rejected and it can be concluded that there is a long run relationship and cointegration exists.

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BAN_EXPORT	-5.058883	4.926074	-1.026960	0.3106
BAN_IMPORT	8.670657	3.212190	2.699298	0.0101
C	63.01859	5.012841	12.57143	0.0000

EC = _1$_BDT - (-5.0589*BAN_EXPORT + 8.6707*BAN_IMPORT + 63.0186)

[Table 16: Levels Equation of Bangladesh through EVIEWS]

EC is the error correction term and it is the residual form long run equation
The p-value of Import is less than 0.05 which is significant whereas the p-value of Export is more than 0.05 which is not significant, so it can be concluded that Import have long run effect on the Exchange Rate- 1$ to BDT whereas Export does not have long run effect on the Exchange Rate- 1$ to BDT.
Thus, the equation stands as:
EC=1$_BDT-(8.6707*Ban_Import+63.0186)
Now we estimate Error Correction Model.

ARDL Error Correction Regression
Dependent Variable: D(_1$_BDT)
Selected Model: ARDL(1, 0, 2)
Case 2: Restricted Constant and No Trend
Date: 02/25/24 Time: 19:04
Sample: 2011Q1 2022Q4
Included observations: 46

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BAN_IMPORT)	0.396487	0.382350	1.036975	0.3060
D(BAN_IMPORT(-1))	-1.101625	0.463695	-2.375753	0.0224
CointEq(-1)*	-0.204447	0.034840	-5.868138	0.0000

R-squared	0.377352	Mean dependent var	0.530435
Adjusted R-squared	0.348391	S.D. dependent var	1.442363
S.E. of regression	1.164309	Akaike info criterion	3.205125
Sum squared resid	58.29142	Schwarz criterion	3.324385
Log likelihood	-70.71788	Hannan-Quinn criter.	3.249801
Durbin-Watson stat	1.453065		

* p-value incompatible with t-Bounds distribution.

[Table 17: Error Correction Model of Bangladesh through EVIEWS]

CointEq (-1) means error correction coefficient. Here, CointEq (-1) is negative and p-value is less than 0.05 which means there is a presence of long run causality. Here, CointEq (-1) means speed of adjustment of any equilibrium towards long run equilibrium state. Here the speed of adjustment is 0.2044*100 = 20.44%, so the speed of adjustment is moderate.

India:

H_0: There is no long run relationship and cointegration does not exist.

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic: n=1000		
F-statistic	5.797768	10%	2.63	3.35
k	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5
Actual Sample Size	47	Finite Sample: n=50		
		10%	2.788	3.513
		5%	3.368	4.178
		1%	4.695	5.758
		Finite Sample: n=45		
		10%	2.788	3.54
		5%	3.368	4.203
		1%	4.8	5.725

[Table 18: F-Bounds Test of India through EVIEWS]

In long run form and bounds we found that in F-Bounds test the value of F-statistic is 5.7978 which greater than I (1) value at 5% level of significance, the null hypothesis gets rejected and it can be concluded that long run relationship and cointegration exists.

Levels Equation Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
IND_EXPORT	-2.062994	4.920160	-0.419294	0.6771
IND_IMPORT	2.920945	3.625373	0.805695	0.4250
C	26.67833	38.27018	0.697105	0.4896
EC = _1$_INR - (-2.0630*IND_EXPORT + 2.9209*IND_IMPORT + 26.6783)				

[Table 19: Levels Equation of India through EVIEWS]

EC is the error correction term and it is the residual form long run equation

The p-value of Export and Import is more than 0.05 which is not significant, so it can be concluded that Export and Import does not have long run effect on the Exchange Rate- 1$ to INR. Thus, no equation is formed.

Now we estimate Error Correction Model.

ARDL Error Correction Regression
Dependent Variable: D(_1$_INR)
Selected Model: ARDL(1, 0, 1)
Case 2: Restricted Constant and No Trend
Date: 02/28/24 Time: 00:26
Sample: 2011Q1 2022Q4
Included observations: 47

ECM Regression Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IND_IMPORT)	-0.106010	0.050721	-2.090069	0.0427
CointEq(-1)*	-0.037649	0.007553	-4.984735	0.0000

R-squared	0.310946	Mean dependent var	0.784762
Adjusted R-squared	0.295634	S.D. dependent var	1.746363
S.E. of regression	1.465662	Akaike info criterion	3.644112
Sum squared resid	96.66737	Schwarz criterion	3.722841
Log likelihood	-83.63663	Hannan-Quinn criter.	3.673738
Durbin-Watson stat	2.042732		

* p-value incompatible with t-Bounds distribution.

[Table 20: Error Correction Model of India through EVIEWS]

CointEq (-1) means error correction coefficient. Here, CointEq (-1) is negative and p-value is less than 0.05 which means there is a presence of long run causality. Here, CointEq (-1) means speed of adjustment of any equilibrium towards long run equilibrium state. Here the speed of adjustment is 0.0376*100 = 3.76%, so the speed of adjustment is very less.

Bhutan:

H_0: There is no long run relationship and cointegration does not exist.

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic: n=1000		
F-statistic	4.295903	10%	2.63	3.35
k	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5
Actual Sample Size	47	Finite Sample: n=50		
		10%	2.788	3.513
		5%	3.368	4.178
		1%	4.695	5.758
		Finite Sample: n=45		
		10%	2.788	3.54
		5%	3.368	4.203
		1%	4.8	5.725

[Table 21: F-Bounds Test of Bhutan through EVIEWS]

In long run form and bounds we found that in F-Bounds test the value of F-statistic is 4.2959 which greater than I (1) value at 5% level of significance, the null hypothesis gets rejected and it can be concluded that long run relationship and cointegration exists.

Levels Equation Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
BHUT_EXPORT	88.40494	64.61489	1.368182	0.1785
BHUT_IMPORT	111.0600	53.61238	2.071537	0.0445
C	38.64643	10.23002	3.777749	0.0005
EC = _1$_BTN - (88.4049*BHUT_EXPORT + 111.0600*BHUT_IMPORT + 38.6464)				

[Table 22: Levels Equation of Bhutan through EVIEWS]

EC is the error correction term and it is the residual form long run equation

The p-value of Import is less than 0.05 which is significant whereas the p-value of Export is more than 0.05 which is not significant, so it can be concluded that Import have long run effect on the Exchange Rate- 1$ to BTN whereas Export does not have long run effect on the Exchange Rate- 1$ to BTN.

Thus, the equation stands as:

EC=1$_BTN-(111.060*Bhut_Import+38.64643)

Now we estimate Error Correction Model.

ARDL Error Correction Regression
Dependent Variable: D(_1$_BTN)
Selected Model: ARDL(1, 0, 1)
Case 2: Restricted Constant and No Trend
Date: 02/28/24 Time: 01:00
Sample: 2011Q1 2022Q4
Included observations: 47

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BHUT_IMPORT)	3.985248	6.033416	0.660529	0.5125
CointEq(-1)*	-0.102696	0.023934	-4.290806	0.0001

R-squared	0.151083	Mean dependent var	0.784255
Adjusted R-squared	0.132218	S.D. dependent var	1.764150
S.E. of regression	1.643391	Akaike info criterion	3.873022
Sum squared resid	121.5330	Schwarz criterion	3.951751
Log likelihood	-89.01601	Hannan-Quinn criter.	3.902648
Durbin-Watson stat	1.883477		

* p-value incompatible with t-Bounds distribution.

[Table 23: Error Correction Model of Bhutan through EVIEWS]

CointEq (-1) means error correction coefficient. Here, CointEq (-1) is negative and p-value is less than 0.05 which means there is a presence of long run causality. Here, CointEq (-1) means speed of adjustment of any equilibrium towards long run equilibrium state. Here the speed of adjustment is 0.1027*100 = 10.27%, so the speed of adjustment is very less.

Myanmar:

H_0: There is no long run relationship and cointegration does not exist.

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic: n=1000		
F-statistic	2.287589	10%	2.63	3.35
k	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5
Actual Sample Size	47	Finite Sample: n=50		
		10%	2.788	3.513
		5%	3.368	4.178
		1%	4.695	5.758
		Finite Sample: n=45		
		10%	2.788	3.54
		5%	3.368	4.203
		1%	4.8	5.725

[Table 24: F-Bounds Test of Myanmar through EVIEWS]

In long run form and bounds we found that in F-Bounds test the value of F-statistic is 2.2876 which less than I (0) value at 5% level of significance, the null hypothesis gets accepted and it can be concluded that no long run relationship and cointegration doesn't exists.

Now we estimate ARDL Model.

ARDL Long Run Form and Bounds Test
Dependent Variable: D(_1$_MMK)
Selected Model: ARDL(1, 0, 0)
Case 2: Restricted Constant and No Trend
Date: 02/28/24 Time: 01:19
Sample: 2011Q1 2022Q4
Included observations: 47

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	87.90874	110.5248	0.795375	0.4308
_1$_MMK(-1)*	-0.152728	0.074587	-2.047641	0.0467
MYAN_EXPORT**	146.1182	118.9257	1.228651	0.2259
MYAN_IMPORT**	-31.89274	110.7011	-0.288098	0.7747

* p-value incompatible with t-Bounds distribution.
** Variable interpreted as Z = Z(-1) + D(Z).

[Table 25: ARDL Model of India through EVIEWS]

For currency exchange rate- 1$ to MMK its lagged period has a negative influence on itself. In case of both Import and Export at level it does not have any impact on exchange rate- 1$ to MMK.

Sri Lanka:

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic: n=1000		
F-statistic	3.541648	10%	2.63	3.35
k	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5
Actual Sample Size	47	Finite Sample: n=50		
		10%	2.788	3.513
		5%	3.368	4.178
		1%	4.695	5.758
		Finite Sample: n=45		
		10%	2.788	3.54
		5%	3.368	4.203
		1%	4.8	5.725

[Table 26: F-Bounds Test of Sri Lanka through EVIEWS]

In long run form and bounds we found that in F-Bounds test the value of F-statistic is 3.5416 which is in between I (0) and I (1) value at 5% level of significance, which concludes the test is inconclusive.

Nepal:

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic: n=1000		
F-statistic	4.805314	10%	2.63	3.35
k	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5
Actual Sample Size	46	Finite Sample: n=50		
		10%	2.788	3.513
		5%	3.368	4.178
		1%	4.695	5.758
		Finite Sample: n=45		
		10%	2.788	3.54
		5%	3.368	4.203
		1%	4.8	5.725

[Table 27: F-Bounds Test of Nepal through EVIEWS]

In long run form and bounds we found that in F-Bounds test the value of F-statistic is 4.8053 which greater than I (1) value at 5% level of significance, the null hypothesis gets rejected and it can be concluded that long run relationship and cointegration exists.

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NEP_EXPORT	7.968799	192.1242	0.041477	0.9671
NEP_IMPORT	33.33601	18.50958	1.801014	0.0792
C	90.25691	14.51934	6.216325	0.0000

EC = _1$_NPR - (7.9688*NEP_EXPORT + 33.3360*NEP_IMPORT + 90.2569)

[Table 28: Levels Equation of Nepal through EVIEWS]

EC is the error correction term and it is the residual form long run equation
The p-value of Export and Import is more than 0.05 which is not significant, so it can be concluded that Export and Import does not have long run effect on the Exchange Rate- 1$ to NPR.
Thus, the equation stands as:
EC=1$_NEP-90.2569
Now we estimate Error Correction Model.

ARDL Error Correction Regression
Dependent Variable: D(_1$_NPR)
Selected Model: ARDL(1, 0, 2)
Case 2: Restricted Constant and No Trend
Date: 02/28/24 Time: 09:44
Sample: 2011Q1 2022Q4
Included observations: 46

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NEP_IMPORT)	-7.180031	2.812733	-2.552689	0.0146
D(NEP_IMPORT(-1))	-5.144692	2.935215	-1.752748	0.0873
CointEq(-1)*	-0.104682	0.023029	-4.545641	0.0000

R-squared	0.277548	Mean dependent var	1.291377
Adjusted R-squared	0.243946	S.D. dependent var	2.842630
S.E. of regression	2.471705	Akaike info criterion	4.710687
Sum squared resid	262.7010	Schwarz criterion	4.829946
Log likelihood	-105.3458	Hannan-Quinn criter.	4.755362
Durbin-Watson stat	1.900789		

* p-value incompatible with t-Bounds distribution.

[Table 29: Error Correction Model of India through EVIEWS]

CointEq (-1) means error correction coefficient. Here, CointEq (-1) is negative and p-value is less than 0.05 which means there is a presence of long run causality. Here, CointEq (-1) means speed of adjustment of any equilibrium towards long run equilibrium state. Here the speed of adjustment is 0.1047*100 = 10.47%, so the speed of adjustment is very less.

Thailand:

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	1.652428	10%	2.63	3.35
k	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5
Actual Sample Size	47		Finite Sample: n=50	
		10%	2.788	3.513
		5%	3.368	4.178
		1%	4.695	5.758
			Finite Sample: n=45	
		10%	2.788	3.54
		5%	3.368	4.203
		1%	4.8	5.725

[Table 30: F-Bounds Test of Thailand through EVIEWS]

In long run form and bounds we found that in F-Bounds test the value of F-statistic is 1.6524 which less than I (0) value at 5% level of significance, the null hypothesis gets accepted and it can be concluded that no long run relationship and cointegration does not exists.

Now we estimate ARDL Model.

ARDL Long Run Form and Bounds Test
Dependent Variable: D(_1$_THB)
Selected Model: ARDL(1, 0, 1)
Case 2: Restricted Constant and No Trend
Date: 02/28/24 Time: 09:52
Sample: 2011Q1 2022Q4
Included observations: 47

Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.081496	2.504261	0.032543	0.9742
_1$_THB(-1)*	-0.057920	0.071706	-0.807752	0.4238
THAI_EXPORT**	0.026343	0.119805	0.219882	0.8270
THAI_IMPORT(-1)	0.071621	0.088887	0.805748	0.4249
D(THAI_IMPORT)	-0.115421	0.132251	-0.872741	0.3878

* p-value incompatible with t-Bounds distribution.
** Variable interpreted as Z = Z(-1) + D(Z).

[Table 31: ARDL Model of India through EVIEWS]

For currency exchange rate- 1$ to THB its lagged period has no influence on itself and even in case of both Import and its lagged variable and Export at level it does not have any impact on exchange rate- 1$ to THB as the p-value is greater than 0.05 which means there is no significance.

6. Findings and Implications

The granger causality test with VAR reveals that the concept of granger significantly influences the economic system, affecting exchange rates in various countries. In Bangladesh, import does granger cause an exchange rate of 1$ to BDT, while export does not granger cause an exchange rate of 1$ to BDT. In India, import, export, and all do not granger cause an exchange rate of 1$ to INR, as the P-value is greater than 0.05. In Bhutan, export does granger cause an exchange rate of 1$ to BTN, while in Myanmar, import, export, and all do not granger cause an exchange rate of 1$ to MMK. In Nepal,

import, export, and all do not granger cause an exchange rate of 1$ to NPR, while in Sri Lanka, import, export, and all do not granger cause an exchange rate of 1$ to LKR. In Thailand, import, export, and all do not granger cause an exchange rate of 1$ to THB.

The study reveals that the exchange rate of $1 to BDT has a minor impact on import and export, with no substantial influence on trade. The exchange rate of $1 to BTN and trade have a moderate association, with trade accounting for a considerable adjustment. A substantial positive association between the exchange rate and trade and a positive relationship between export and import is found. The exchange rate of $1 to INR and trade have a modest link, with import and export having less impact than import. The Null hypothesis suggests a strong positive correlation. The exchange rate of $1 to MMK and trade have a moderate association, with trade accounting for a considerable adjustment. The exchange rate of $1 to THB and trade have a weak association, with commerce accounting for a large portion of the variance.

The ARDL Model was applied to analyse the influence of exchange rate shocks on foreign trade, based on stationary data at 1st Difference analysed through Unit Root Test.

The study found that Bangladesh has a long-run relationship and cointegration with import and export, with a significant p-value for import and a non-significant p-value for export. India's long-run relationship and cointegration exist. Bhutan also has a long-run relationship and cointegration between import and export, with import having a significant effect on the exchange rate and export not having a long-run effect. The study founds a long-run causality, with a low adjustment speed of 10.27%. The F-Bounds test for Myanmar showed no significant impact, while the ARDL Model showed a negative influence of lagged periods on currency exchange rates but no impact on import and export. Sri Lanka's F-Bounds test yielded that the test is inconclusive. The study in Nepal found that cointegration exists with a low-speed adjustment towards long-run equilibrium between export and import. Thailand's F-Bounds test showed no significant impact on the currency exchange rate. The lagged period and import/export levels also did not significantly affect the exchange rate.

7. Conclusion and Scope for Further Research

BIMSTEC is an organization made up of countries with exchange rates, which affect the trade balances of the member countries. Volatility can translate into more or less competitiveness of exports, changes in import expenses and shifts in the trade deficit/surplus. At the same time, exchange rate risks are important for the of foreign direct investment and, therefore, should remain stable. There are mutual measures that have been put in place to cover for exposure to forex market fluctuations and foster for sound trading interactions with the divergent economy. There must be ways of avoiding risks associated with the critical dependency on major customers or fluctuating industries and that is where diversification techniques come in. The paper also investigates the link between export outcomes and exchange rates and covers information gathered from 1992 to 2003 with a focus put on the quarterly data. Of course, the future studies are possible to consider different kinds of currencies and different countries which may also help to explain the influence of the exchange rates on export results.

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