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A comparative study on determinants of trade balance in South Asian countries: Nepal and Pakistan

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Abstract

The main objective of this study is to analyze the determinants of trade balance in Nepal and Pakistan. The study is based on the secondary data obtained from the World Development indicator for the period 1992 to 2023 A.D covering 32 years. ARDL and ECM test have been applied to measure the degree of long and short run dynamics between the variables. Based on ARDL estimation, the study found real exchange rate being statistically significant and positive while government consumption expenditure, economic growth rate and foreign direct investment were found negative with respect to trade balance in context of Pakistan. Through the estimation the model found that long relation could not be established among the variables in the context of Nepal. Further, the study concludes that both Nepal and Pakistan should adopt tighten fiscal policy measures to reduce government spending for controlling import demand and promoting domestic production through subsidies, infrastructural development, and other incentives are crucial. The overall findings boons the complexity of these interactions, suggesting the need for tailored economic strategies in both countries to achieve a more favorable trade balance.

1. Introduction

Foreign trade refers the statement of export and imports of a country to the rest of the world during one year. It has two dimensions export and import. A country wants to have trade surplus that generates capital for the economic development in the country via saving and investment. Trade is one of the important factors reflecting position of external sector of the economy which has a quantitatively large and robust positive effect on the overall economic performance of a country. Many researchers have been concluded trade play a positive role in growth. Long-run relationship exists between economic growth and trade promotion in a country (Awan & Mukhtar, 2012; Bojanic, 2012). Trade helps to course the economic activities of a country (Nepal & Thapa, 2021). But trade deficit doesn't initially indicate problem in an economy, as consumers tend to gain access to a larger variety of goods and services, and many economists claim that a larger trade deficit signals the desirability of the country's currency (Sharif & Ali, 2016). Extreme levels of imports deplete the foreign currency reserve, resulting in the strengthening of the foreign currency against the domestic currency. Eventually, the import of products and services becomes more expensive as compared to exports (Awn & Mukhtar, 2019).

Exchange rate plays a decisive role in the trade balance of a country. When a country devalues its currency, imported goods tend to be more expensive to domestic buyers, while the exports become less expensive to foreign buyers (Liew 2003; Christensen, 2012). A notable theory Marshall-Lerner condition states that real depreciation leads to an improve trade balance in the long run if the sum-up value of import and export demand elasticity exceeds one. Real depreciation increases the quantity of exports and simultaneously decreases the quantity of imports (Ling, Mun, & Mei, 2008). Trade balance can be found much less sensitive to the movement of real exchange rates in countries with a negative trade balance, indicating that a country with an exponentially larger import than export is quite insensitive to currency depreciation (Falk 2008). Thus, this study tries to examine the relationship between exchange rates and trade balance.

Economic growth of a country relies on the ability to add value to certain goods. Trade plays a vital role in economic growth. As exports increases workers proficiency gradually increases that leads increasing productivity and enhancing the efficiency of export sector. Total economic productivity and growth is promoted with the increase in capacity to export goods globally (Uddin, 2010). Foreign trade plays a crucial role for shaping the economic performance of the country by influencing economic growth and development. A robust body of research confirms the positive impact of trade on economic growth and highlights a long-term relationship between economic growth and trade openness (Awan & Mukhtar, 2019; Bojanic, 2012).

Favorable trade balance makes strong domestic currency (Sharif & Ali, 2016). But persistent and excessive trade deficits can lead to a depletion of foreign reserves more expensive imports (Awan & Mukhtar, 2019). Understanding the elaborate relationship between exchange rates and trade balances is crucial, as currency devaluation typically makes exports cheaper and imports more expensive (Liew, 2003; Christensen, 2012). Despite substantial debate and empirical evidence. Yet, trade balances in countries with excessive trade deficits may exhibit less sensitivity to currency depreciation (Falk, 2008).

However, the impact of FDI on trade balance is quite complex, with short-term benefits potentially overshadowed by longer-term challenges related to trade deficits and economic stability (Anwar & Nguyen, 2011; Shawa & Shen, 2013). In South Asian countries like Nepal and Bangladesh, where high trade deficits exist, the root causes of trade imbalances are domineering. Factors such as GDP growth, exchange rates, FDI inflows, inflation, and government consumption expenditures must be examined to identify their influence on the trade balance (Nepal & Thapa, 2021). Despite existing research, there is a need for a comprehensive investigation into how these variables interact to affect the trade balance, predominantly in the context of countries facing significant trade deficits and economic volatility. This study has addressed these gaps by analyzing the relationships between exchange rate, FDI, and trade balance in Nepal and Pakistan. The study provides some valuable suggestions for preparing effective strategies and policies that can mitigate trade imbalances and promote sustainable economic growth in the country.

2. Review of Literature
Theoretical Review
Marshall-Lerner Condition
Marshall-Lerner's condition states that devaluation of currency improves the country's trade balance when the price elasticity of the demand for export and import is greater than one. More specifically as the currency depreciates, the exports become cheaper for foreign buyers which increases the export quantities. In contrast, the imports become more expensive to domestic consumers, which reduces the import quantities. But in practice, the effect of currency devaluation might not be immediate, as there can be a lag before the trade balance adjusts accordingly. A period of decline occurs which is later followed by a period of improvement, creating a shape J; J-curve.

The theory suggests that the trade balance of the country initially degrades before eventually improving, resembling the shape 'J' over time. It occurs because of increase in import price quickly, leading to a higher import cost, while export quantities might not increase immediately as parties involved in the process take time to respond to the new lower price. Throughout time, the new lower price becomes attractive for a foreign buyer resulting in an increase in exports while simultaneously the domestic customers reduce their imports due to the higher cost of the goods.

Absorption Approach to the Balance of Payment
The absorption approach to the balance of payment was developed by Sidney Alexander in 1950s, which explain how a country's trade balance is influenced by the country's economic activities. The trade balance is generally expressed as the difference between total import and total export, here either deficit or surplus is found where deficits are seen when the country's absorption exceeds the country's output, conversely surplus occurs when output exceeds the absorption. Generally, absorption refers to the total amount of goods and services consumed within the economy. The absorption approach states that the current account balance is influenced by the relationship between domestic absorption and total output. If the absorption exceeds the output or the country faces a deficit, to cover the excess absorption, the country must import more than export to fulfill the demand, leading to a higher trade deficit whereas if a country's absorption is less than output a trade surplus is experienced.

Monetary Approach to the Balance of Payment
The monetary approach to the balance of payment emphasizes the role of monetary factors of a country in determining the balance of payment. Mainly it focuses on understanding the relationship between money supply, interest rates, and the country's balance of payment. It states that the balance of payment is primarily influenced by the demand and supply of money, which affects the capital flow in the market, more specifically flow toward the trade. As the money supply increases on the market, the interest rates are lowered, which makes domestic investment assets less attractive compared to foreign securities. Lower interest rates lead to capital outflow as every investor tends to seek higher returns. The increased outflow of capital and higher demand for foreign assets leads to depreciation of foreign currency which makes imports expensive and exports cheaper and more attractive. This phenomenon potentially corrects the current account deficit in the country. Similarly, contractionary monetary policy decreases money supply whereby increases the interest rates attracting foreign investors with increased demand for the domestic currency which leads to currency appreciation, eventually making exports more expensive and imports less expensive causing a current account deficit in the country.

Empirical Review
The empirical literature review incorporates a comprehensive exploration of factors influencing the trade balance across the countries. Through the review of numerous articles, a comprehensive understanding of the drivers behind trade balance can be developed. These articles provide valuable insights into the nature of trade balance.

Liew (2003) investigated the relationship between exchange rate changes and trade balances among the ASEAN-5 countries and concluded that the role of exchange rate change initiating a positive change in trade balance may have been exaggerated on earlier paper and the depreciation of currency in many countries between periods 1986 to 1995 only resulted in deterioration of trade balance. But the study

concludes that trade balances are rather significantly influenced by real money as compared to nominal exchange rates. Lopez (2005) examined the relationship between Foreign direct investment, export and import in Mexico and found a significant positive relationship between FDI and export. While the increase of FDI did positively impact the export, increase in higher import was also found in the production process. Indicating that the FDI inflow increases the reliance on imported components. Although an increment on export is seen, the impact isn't substantial enough to raise the country's output growth rate. Additionally, the study found a bidirectional causal relationship of FDI with both import and export.

Cavallo (2007) analyzed the interaction between economic variables such as government consumption, current account balance, investment, labor supply and trade balance while examining how different generations of households interact with economic variables over time. The paper found that government consumption has a different effect on current account balance. The negative relationship between the variables indicated that the increase on government expenditure on goods led to significant deterioration in the current account while the increase on hours worked had a considerably smaller impact. The finding shows that large exponential expenditure on national level which does not result in market creation, rather was diverted toward larger import for consumption, as increase of hours worked does support the argument.

Dusa (2007) examined the relationship between trade balance, money supply and exchange rates in Malaysia and found the existence of a long-run relationship between trade balance, income and money supply variables, indicating that increase in money supply did improve the trade and general income of the country. But the relationship could not be found between trade balance and real exchange rate.

Anwar and Nguyen (2011) examined the relationship between foreign direct investment (FDI) and trade balance in Vietnam which has suggested that FDI played a crucial role in enhancing the country's total trade. Additionally, the study found that both exports and imports are complementary to FDI. Iyke (2017) explored that real depreciation of currency has a negative effect on the trade balance in the short run, but the effect in the long run is reversed as trade balance enhances over time that is consistent with the J-curve phenomenon. Awan & Mukhtar (2019) found that FDI had a positive impact on the trade deficit indicating larger growth in foreign investment tends to increase imports. Nepal & Thapa (2020 found exchange rate, GDP, and inflation had positive impact on trade balance in the long run, while negative impact of government consumption expenditure.

3. Methods and Materials

The main objective of the study is to analyze the factors influencing trade balance in Nepal and Pakistan. Based on the objective, descriptive and causal comparative research design have been employed for the study. Quantitative research has been applied for identification and description of the variables (Garner et al., 2009). Similarly, causal comparative research designed for the examination of effect of the independent variable on the dependent variable. The study focused on obtaining a cause-and-effect relationship between the variables and intended to analyze the situations and patterns of relationships between the variables under study.

Data and Methodology

The study is based on secondary data which were attained from World Development Indicators from the period of 1992 AD to 2023 AD. As per the Development Indicator 2023, Nepal and Pakistan had the lowest GDP per capita among the South Asian countries, Nepal with a GDP per capita of $1,324.03 and Pakistan with $1,407.02. Considering the size of GDP per capita, Nepal and Pakistan were taken as the primary sample for this study. The data analysis process follows the EViews and Microsoft Excel software. Descriptive statistics to understand the past movement of the variables. Normality of the data has been analyzed for further regression analysis. Similarly, homoscedasticity test, multicollinearity test, Durbin Watson test for autocorrelation and augmented ducky fuller test of stationary have been conducted to meet the basic assumptions of regression analysis. Furthermore, a cointegration bound test has been performed to understand if a long-run relationship exists between the variables. Error correction model is tested to understand the short-run relations among the variables.

The study has taken Gross Domestic Product growth rate (GDPGR), Foreign Direct Investment (FDI), Real Exchange Rate (REXR), and Government Consumption Expenditure (GCE) as the independent variables and Trade balance (TB) as the dependent variable. It is expressed in functional form as:

$$TB = f (GDPGR, FDI, REXR, GCE)$$

Model Specification

The impact of gross domestic product growth rate (GDPGR), foreign direct investment (FDI), government consumption expenditure (GCE) and real exchange rate (REER) on trade balance (TB) was assessed using the model:

$$TB = \beta_0 + \beta_1 GDPGR + \beta_2 FDI + \beta_3 GCE + \beta_4 REXR + \epsilon$$

Where, β_0 = Constant; β_1, β_2, β_3, β_4 = Coefficient for the independent variables. ϵ = error term; GDPGR = Gross Domestic Product Growth Rate; FDI = Foreign Direct Investment; GCE = Government Consumption Expenditure; REXR = Real Exchange Rate; TB = Trade Balance

4. Empirical Results

Descriptive Statistics

Table 2 presents the descriptive profile of the variables taken in this study. It offers a detailed overview of the variables from the period 1992 – 2022 A.D.

Table 2. *Descriptive Statistics of the Variables in Nepal*

Variables	TB	GDPGR	FDI	GCE	REXR
Mean	0.44	4.40	0.23	8.68	92.57
Standard Error	0.04	0.40	0.04	0.13	2.77
Median	0.41	4.53	0.21	8.64	96.36
Standard Deviation	0.20	2.25	0.22	0.71	15.41
Kurtosis	-1.57	2.28	-1.15	1.32	-1.38
Skewness	0.10	-0.77	0.27	0.98	-0.08
Minimum	0.13	-2.37	-0.10	7.53	69.69
Maximum	0.77	8.98	0.68	10.78	118.60
No. of observations	31	31	31	31	31

The kurtosis measures whether the distribution is heavy-tailed or light-tailed relative to normal distribution. As the value of the variables are seen to be under 3, the data tends to produce fewer and less extreme outlines. Similarly, skewness measures the asymmetry of the distribution. The value of TB, FDI, and GCE tends to be positive, indicating that the tail is on the right side of the distribution, in contrast, the negative value of GDPGR and REXR indicates the tail being on the left side of the distribution. Although certain skewness is seen in the distribution, we later conclude that the variables have normal distribution throughout the period.

Table 3. Descriptive Statistics of the Variables in Pakistan

Variables	TB	GDPGR	FDI	GCE	REXR
Mean	0.69	4.09	0.96	10.78	100.08
Standard Error	0.03	0.37	0.12	0.19	7.84
Median	0.65	4.22	0.74	10.61	100.00
S.D.	0.16	2.05	0.68	1.06	43.64
Kurtosis	-1.22	0.35	3.56	-0.21	-1.02
Skewness	0.18	-0.23	2.00	0.35	0.42
Minimum	0.45	-1.27	0.31	8.66	37.80
Maximum	0.97	7.83	3.04	13.02	179.42
Observation	31	31	31	31	31

The kurtosis measures whether the distribution is heavy-tailed or light-tailed relative to normal distribution. As the value of most variables are seen to be under 3, the data tends to produce fewer and

less extreme outlines. Similarly, skewness measures the asymmetry of the distribution. The value of TB, FDI, REXR, and GCE tends to be positive, indicating that the tail is on the right side of the distribution, in contrast, the negative value of GDP indicates the tail being on the left side of the distribution.

Normality Test

Jarque-Brea test is done to determine whether the data follows a normal distribution, in Nepal & Pakistan. With a derived null hypothesis stating data follows a normal distribution, the test is based on the skewness and kurtosis of the data, with a normal distribution having a skewness value of 0 with kurtosis value of 3, where higher kurtosis value indicates more outliner and vice-versa.

Table 4. *Jarguq -Bera Normality Test*

	Pakistan	Nepal
Skewness	0.004824	-0.1053
Kurtosis	2.185059	2.801
Jarque-Bera	0.8579	0.1082
p-value	0.6511	0.9472

As per the table 4, the skewness of Pakistan is at 0.004824 indicating the distribution is almost perfectly symmetrical with Nepal skewness value at -0.1053 indicates a slight left skewed, but close to symmetrical. Furthermore, the kurtosis value of 2.185059 and 2.801 indicates a flatter distribution with light tails than normal for Pakistan and slightly peaked than normal distribution but closer to normal for Nepal. Since the skewness is 0.004 for Pakistan with a p-value of 0.6511 (65.11%), that is greater than 0.05 (5% level of significance). So, findings support the null hypothesis and concludes the given data is normally distributed.

Furthermore, the skewness of -0.1053 for Nepal that indicates a slight negative skew in the data, but the magnitude is very close to zero, which means data are distributed almost symmetrically. The p-value of 0.9472 (94.72%) which is greater than 0.05 (5% level of significance) accepts the null hypothesis concluding the data being normally distributed.

Table 5. *Long-run Relationship in Pakistan*

Variables	Coefficient	Std. Error	t-statistic	P-value
C	1.107509	0.152125	7.280243	0.0000
FDI	-0.041875	0.020024	-2.091206	0.0464
GCE	-0.065754	0.014526	-4.526528	0.0001
GDPGR	-0.008257	0.006752	-1.222821	0.2324
REXR	0.003669	0.000346	10.59551	0.0000
$R^2 = 0.8152$, Adjusted $R^2 = 0.7868$, F-stats = 28.69, p-value = 0.0000				

As per the table 5, foreign direct investment (FDI), Government consumption expenditure (GCE) and Gross domestic product growth rate (GDPGR) have a negative effect on the trade balance. Although GDP's relation is not statistically significant, the p-value of FDI (0.0464) indicated the relation being statistically significant with GCE (0.0001) indicated relation being highly significant. Additionally, the Real exchange rate (REXR) tends to have a positive and highly significant relation with the trade balance. The model has R-square value of 0.81529, indicating that the model explains approximately 81.53% of the variability on the trade balance with F-statistic value at 28.69 (p-value = 0.000) indicating the model being statistically significant.

Similarly, in context of Nepal, FDI, GCE and GDPGR tends to have negative coefficient value, indicating that the increase of FDI, GCE or GDPGR decreases the Trade balance, but the findings are not significant as the p-value of each variable FDI (0.5896), GCE (0.5874), and GDPGR (0.3379) indicates the relation of the variables with trade balance not statistically significant. In contrast to these variables, the real exchange rate (REXR) tends to have a positive and highly significant coefficient value, indicating that an increase on REXR tends to increase the trade balance, (p-value = 0.000). The model has an R-square of 0.8582, with F-stats of 39.35 (p-value = 0.000) suggesting that 85.82% of the variability in trade balance is explained by the model.

Table 6. *Long-run Relationship in Nepal*

Variables	Coefficient	Std. Error	t-statistic	P-value
C	-0.5361	0.203647	-2.63268	0.0141
FDI	-0.044613	0.081673	-0.546237	0.5896
GCE	-0.01207	0.021967	-0.549444	0.5874
GDPGR	-0.006697	0.00686	0.976288	0.3379
REER	0.012085	0.001181	10.23543	0.0000
$R^2 = 0.8582$, Adjusted $R^2 = 0.8364$, F-stats = 39.35, p-value = 0.0000				

Homoscedasticity Test

Breusch-Pagan-Godfrey statistics has been applied to measure the presence of heteroscedasticity in a regression model. As the variance of the error in the model is not constant across all levels of the explanatory variables, this can lead to an inefficient estimate. An inconsistent variance of the error term in the model is taken as the existence of heteroscedasticity. With this assumption of null hypothesis stating the variance of the residual is constant across the level.

Table 7. *Homoscedasticity Test*

	Pakistan	Nepal
F-statistic	1.8233	2.1517
p-value	0.1546	0.1028
Prob. Chi-square	0.1474	0.1028

As the test is conducted with a 5% level of significance, the table 4.4 presents the prob. Chi-square value is at 0.1474 (Pakistan) and 0.1028 (Nepal) indicating that there is no significant evidence of heteroscedasticity on the regression model.

Multicollinearity Test – VIF Test of Residuals

A variance inflation factor test has been conducted to detect the existence of multicollinearity in the regression model. This phenomenon usually exists when two or more explanatory variables in a regression model are highly correlated, that causes problems in the estimation of reliability of the regression coefficients. The VIF test supports to quantify the existence of multicollinearity by indicating the inflation of variance.

Table 8. *Multicollinearity test of the Model*

Variables		Coefficient Values	Centered VIF
C	Nepal	0.041472	NA
	Pakistan	0.023142	NA
	Nepal	0.00667	1.396
REXR	Pakistan	1.20E-07	1.264
	Nepal	0.000483	1.064
GDPGR	Pakistan	4.56E-05	1.065
	Nepal	4.71E-05	1.037
GCE	Pakistan	0.000211	1.305
	Nepal	1.39E-06	1.446
FDI	Pakistan	0.000401	1.03

Usually, a focus is placed on a threshold value of 5, indicating a value below 5 is considered acceptable. As per our test, the centered VIF of the variables tends to be lower than 5, indicating that multicollinearity is not a significant concern in our regression model, as the independent variables in the model are not highly collinear with each other. Additionally, VIF values are greater than 1 because a VIF less than 1 would indicate there is no correlation among the independent variables on the regression model, which is not typical for standard regression analysis.

Durbin Watson Test

Breusch-Godfrey serial correlation (LM) test has been conducted to test the presence of autocorrelation in the regression equation. Usually, autocorrelation occurs when residuals of one period are correlated with residuals of another period. Since a key assumption of ordinal least square regression is that residuals are independent of each other, the presence of autocorrelation violates this assumption.

Table 9. *Breusch-Godfrey Test for Autocorrelation*

Countries	Variables	Coefficient	P-value	DW statistic	F-statistic	P-value
Pakistan	FDI	0.001	0.957			
	FGCE	0.0041	0.783			
	GDPGR	-0.0007	0.911	1.878	1.057	0.314
	REER	-3.35E-05	0.924			
	RESID (-1)	0.2137	0.313			
	FDI	0.0112	0.825			
Nepal	FGCE	0.0015	0.914			
	GDPGR	0.0005	0.889	1.857	1.12	0.301
	REER	-0.0011	0.561			
	TB (-1)	0.103	0.513			
	RESID (-1)	-0.2812	0.3			

H_0 = No autocorrelation in the regression at a 5% level of significance

Table 9 presents the Breusch-Godfrey value, p-value at 0.314 (Pakistan) and 0.301(Nepal), as the null hypothesis cannot be rejected since the p-value is significantly greater than 0.05, indicating that there is no autocorrelation in the regression. Additionally, DW values of 1.87 and 1.857 at n/k (31, 4) indicate there is no evidence of significant autocorrelation.

Augmented Dicky Fuller – Test for Stationary

Augmented Dickey-Fuller Test has been conducted to test whether variables are stationary or not. The test helps to check if the time series has a unit root. With a null hypothesis stating the series has a unit root. If the statistic is greater than the critical value, we do not have enough evidence to reject the null hypothesis, indicating the series may be non-stationary. The stationary of the regression equation is done before proceeding with the Auto Regressive Distributed Lag test. The ARDL test can only be done if the variables are stationary at level I(0) or are integrated of order one I(1); first-order difference.

Table 10. *ADF Test of Pakistan*

Variables	P-value				Remarks
	Level		First Difference		
	Intercept	Trend and Intercept	Intercept	Trend and Intercept	
TB	0.7281	0.0079	0.0299**	0.0631*	I(1)
FDI	0.063	0.1661	0.0126**	0.0513*	I(1)
GDPGR	0.0254	0.1131	0.0000***	0.0000***	I(1)
REER	0.218	0.8071	0.0022***	0.049**	I(1)
GCE	0.0057**	0.0443**	-	-	I(0)

* Significant at 10%   ** Significant a 5%   *** Significant at 1%

In Pakistan, Government Consumption expenditure has been found to be stationary in level form i.e. I(0) while trade balance (TB), foreign direct investment (FDI), gross domestic product growth rate (GDPGR), and real exchange rate (REXR) are found to be stationary at first difference i.e. I(1). Similarly, in the context of Nepal, the gross domestic product growth rate (GDPGR) has been found to be stationary in level form i.e. I(0) while variables such as trade balance (TB), foreign domestic income (FDI), real exchange rate (REXR), and government consumption expenditure (GCE) are found to be stationary in the first difference I(1).

Table 11. *ADF test of Nepal*

Variables	P-value				Remarks
	Level		First Difference		
	Intercept	Trend and Intercept	Intercept	Trend and Intercept	
TB	0.9256	0.2686	0.0000***	0.0000***	I(1)
FDI	0.1496	0.019	0.0000***	0.0000***	I(1)
GDPGR	0.0002***	0.0014**	-	-	I(0)
REER	0.8561	0.0602	0.0000***	0.0001***	I(1)
GCE	0.1391	0.2042	0.0475**	0.0115**	I(1)
	* Significant at 10%		** Significant a 5%		*** Significant at 1%

Cointegration Bound Test

Since variables are the combination of I(0) and I(1), the study has chosen the Autoregressive Distributed Lag Model for estimation. The result of the ARDL bound test displays that F-statistics are greater than both lower bound and upper bound at a 95% confidence level. Therefore, co-integration exists in the model. The lag is selected as ARDL (1,0,2,0,0) for Pakistan.

Table 12. *Bound Test of Pakistan*

ARDL Bound Test: f (TB| FDI, GDPGR, REXR, GCE): ARDL (1,0,2,0,2)					
F-Statistic	Lower Bound 99%	Upper Bound 99%	Lower Bound 95%	Upper Bound 95%	Remarks
5.08349	3.29	4.37	2.56	3.49	Significant at 99%

Table 12 shows F-statistic value is 5.083 which conforms that the long-run equilibrium relation between the dependent variable and one or more independent variables exists. Since the F-value (5.08349) is above the upper bound (4.37) critical value at a 1% level of significance, we reject the null hypothesis and conclude that a long-run relationship exists in the case of Pakistan.

Table 13. *Bound test of Nepal*

ARDL Bound Test: f(TB| FDI, GDPGR, REER, GCE) : ARDL (1,0,2,0,2)					
F-Statistic	Lower Bound 99%	Upper Bound 99%	Lower Bound 95%	Upper Bound 95%	Remarks
2.3182	3.29	4.37	2.56	3.49	Significant at 99%

Whereas the F-statistic value for Nepal is at 2.3182, which is lower than the lower bound (2.56) critical value at a 5% level of significance, we fail to reject the null hypothesis, stating that there is no long-run relationship between the dependent variable with one or more independent variables.

Since long-run relationships only exist in Pakistan, long-run tests along with error correction model tests are done. In contrast, Nepal fails to maintain a long-run relationship, so there is no requirement to conduct a long-run test among the variables.

Table 14. *Estimate long-run coefficients using ARDL Approach*

Dependent variable; TB				
Variables	Coefficient	Standard Error	t-Statistic	p-value
FDI	-0.030222	0.025457	-1.187167	0.2498
GDPGR	-0.061337	0.015969	-3.841075	0.0011
REER	0.004507	0.00406	11.10076	0.0000
GCE	-0.084886	0.017513	-4.84695	0.0001
R^2 = 0.9422	adj R^2 = 0.9149	DW = 2.148	F-stat = 34.45, p-value = 0.000			

Table 14 presents the long-run coefficient of the model. The coefficient of the REER is statistically significant at zero percent and positive. The result indicates that change in the real exchange rate by a unit will increase the trade balance of Pakistan by 0.0045 units while other variables remain constant.

Similarly, the coefficient of GCE is statistically significant below 1 percentage but negative, indicating that an increase in government consumption leads to a reduction of trade balance by 0.084 units. Similarly, the coefficient of GDPGR is statistically significant below 5 percent and negative. If the gross domestic product is increased one unit, the trade balance of Pakistan tends to decrease by 0.0613 units when all other variables remain constant. Finally, FDI has negative coefficient and statistically insignificant indicates that an increase of FDI by a unit leads to a reduction of trade balance by 0.030 units. Although FDI has a negative coefficient, the finding isn't statistically significant considering the p-value (0.2498). The R-square is 0.9422 indicating that 94.22 percent of variance is explained by the model.

Error Correction Model for Pakistan

Since long run association has been observed among the variables, we can explore the possibilities of short run relationship by using the error correction model framework.

Table 15. *Error Correction Representation for Pakistan*

	Dependent variable; TB			
Variables	Coefficient	Standard Error	t-Statistic	p-value
dGDPGR	-0.014767	0.003774	-3.913165	0.0009
dGDPGR1	0.009369	0.005506	1.701678	0.1051
dGCE	-0.01386	-1.337365	-1.337365	0.1969
dGCE1	-0.714879	0.115172	2.2806	0.0000
CointEq1	-0.7148	0.1151	-6.207	0.0000
$R^2 = 0.7439$ | adj $R^2 = 0.7013$ | DW = 2.148 |				

Table 15 depicts the short-run error correction model. The coefficient of the error correction model is negative and significant under 1 percent. The coefficient is -0.7148, which indicates that 71.48 percent of the disequilibrium in the previous years was corrected within one year. The coefficient of GDP at the first lag order is negative and statistically significant below 1 percent. The coefficient of 0.014767 indicates that an increase in GDP growth rate would decrease the trade balance of Pakistan's economy by 0.014787 units in the short run. However, the second lag order is statistically insignificant although the coefficient is positive, indicating that the growth of GDP would increase the trade balance by 0.0093 units. Similarly, the coefficient for GCE is -0.01386, indicating that an increase in government consumption by a unit can lead to a decrease of trade balance by 0.01386 units, but the findings tend to be statistically insignificant, although the second lag order tend to be statistically significant below 1 percentage with coefficient value at -0.7148.

Error Correction Model for Nepal

Since long run association has been observed among the variables, we can explore the possibilities of short run relationship by using the error correction model framework.

Table 16. *Error Correction Representation for Nepal*

	Dependent variable; TB			
Variables	Coefficient	Standard Error	t-Statistic	p-value
dGCE	0.016098	0.011597	1.38808	0.1821
dFDI	0.047671	0.043285	1.101325	0.2853
dFDI1	-0.099162	0.040884	-2.425427	0.026
dGDP	-0.006269	0.002631	-2.382641	0.0284
dGDP1	0.00784	0.002756	2.84423	0.0108
CointEq1	-0.243034	0.057648	-4.215794	0.0005
$R^2 = 0.497063$, adj $R^2 = 0.387728$, DW = 2.921857				

Table 16 presents the short-run error correction result of the variables. The coefficient of error correction term is negative and significant under 1 percent. The coefficient is -0.2430, which indicates that 24.30 percent of the disequilibrium in the previous years will be corrected within one period of time. The coefficient of GCE in the first lag order is positive but statistically insignificant with the value of 0.016098 indicates that an increase in government consumption would increase the trade balance of the

Nepalese economy by 0.016098 units in the short run. FDI on the first lag tends to be positive but insignificant with coefficient value 0.047671 indicating that a unit change in foreign direct investment will result in improvement trade balance by 0.04767 units although findings are statistically insignificant, but the second lag orders present the coefficient value at 0.099162 indicating that the FDI would negatively impact the TB by 0.099162 units for every FDI unit increased and the findings tends to statistically significant. Likewise, GDP tends to negatively and later positively impact the trade balance as the coefficient value is -0.006269 and 0.00784 simultaneously for first and second lag order while both findings tend to be statistically significant.

The trend analysis of trade balance interprets that both countries have faced a downfall, indicating huge imports on goods but minimal goods being exported comparatively. The steep decline can also signify consumer reliance on imported goods rather than domestically produced ones, or absence of sufficient production in the home country.

Although exponential inflow of investment did not have positive impact on GDP in Pakistan. The finding implies that FDI does not have a significant effect on the gross domestic product of the country. Based on the table 16, the constant value of Nepal tends to be negative indicating that the trade balance gradually decreases overtime. While Pakistan's findings show that the trade balance does improve over the period. FDI, GCD and GDP growth rate have a negative coefficient while REER have a positive, GCE and REER tend to be the only statistically significant variables in the context of Pakistan. R square value of 0.8152 indicates that the model can explain approximately 81.53percent of variability on the trade balance.

Similarly, all variables except real exchange rate tend to have a negative relation with trade balance, but all the results tend to be statistically insignificant except REER in context to Nepal. Breusch-pagan tests show the data being homoscedasticity at five percent level of significance. VIF tests show that multicollinearity does not exist on our model. The VIF value lower than the threshold value of five indicates that the variables are not highly collinear to each other. Durbin Watson measure the correlation among the variables, Breusch-Godfrey test is conducted to measure it, as the p-value of both countries; Nepal (0.301) and Pakistan (0.3.14) are significantly greater than 0.05, suggesting absence of autocorrelation in the model. Augmented Dicky Fuller test shows that government expenditure tends to be stationary at level form while all other variables are stationary at first difference in context of Pakistan.

Only gross domestic growth rate tends to be stationary at level, while all other variables are stationary at first difference in context of Nepal. The bound test presents us that a long run relationship between dependent and independent variables exist in Pakistan while no long run relationship could be found in context of Nepal's variables. ARDL test found real exchange rate being statistically significant and positive while government consumption, gross domestic product growth rate and foreign direct investment was found negative with respect to trade balance in context of Pakistan. The ECM model indicates that the 71.48% of disequilibrium in previous year is corrected in one year in context of Pakistan. While the long relation could not be established among the variables in context of Nepal, the error correction model presents that the disequilibrium in previous year will be adjusted by 24.3% within one year for Nepal.

5. Discussion

The findings of the study support Yuen (2008) findings where long run relationship exist in the context of Pakistan's economy where real exchange rates significantly influenced the trade balance, indicating that the variables are interconnected. Although the real exchange rate for both countries tends to be close to zero implies that any depreciation in real exchange rate has a minimal effect on the trade balance. Even though, the findings showed the effect of REER comparatively greater in Nepal. As the coefficient values are minimal, the findings support Marshall-Lerner theory, whereby it states that the devaluation of currency generally improves the country's trade deficit. Similarly, Irhan et al (2011), Ng et al (2008) found that exchange rate depreciation improves the trade balance in a strong and significant way in the long run. The study shows that real exchange rate tends to have a positive but small effect on trade balance. This phenomenon could be explained as per the findings of Falk (2008). the results in a statistically significant but less positive effect. However, it is opposite to the findings of Lyke & Ho

(2017). The GDP growth rate tends to have a negative and statistically insignificant effect on the trade balance for both countries, indicating that increased in gross domestic product has decreased trade of the country. Kayhan & Bayat (2013) found that spending on infrastructure promotes a country's competitiveness and potentially improves the trade balance over time while expenditures and imports for domestic consumption led to increased imports and a worsening trade balance. In the context of both Nepal and Pakistan, higher reliance on import for domestic production has resulted in negative impact on GDP, indicating that the cost of import immensely overlaps the final domestic product value. The finding contradicts with Nepal & Thapa (2020), where GDP had a positive relation to trade balance. Kayhan & Bayat (2013) states that while investment on development of infrastructure is done with a goal to improve GDP eventually, the expenditures and import for the raw material worsen the trade balance in the short run. Even though GDP and trade balance must have a positive relation in the long run, our paper fails to develop such a relation.

As per many theories, inflow of FDI gradually increases the trade balance of the host country. Lopez (2005) found in Mexico that the surge of FDI has a notable impact on the country's trade balance and additionally noted that a causal relationship existed whereby FDI inflow and export stimulated one another. Similarly, Mohammad (2010) found that FDI has a positive effect on trade balance indicating that inflow of FDI can motivate companies to produce import substitution products domestically and reduce import and have a positive impact on trade balance. Ray (2012) observed both the short and long relationship of FDI and trade balance in the Indian economy which had a significant impact on the trade balance. Similarly, Cavallo (2007) found a long run relationship between FDI, and trade balance was seen in Pakistan. These findings support the Awan (2019), although FDI was found statistically insignificant, there is a possibility that the sample size of the data could have reduced the significance of our findings. But in context of the Nepalese economy, FDI tends to negatively affect the trade balance indicating an increase of trade deficit with gradual inflow of foreign investment. Since the Nepalese economy largely relies on imported goods rather than self-sustenance, the larger capital of FDI can be seen in import-based businesses, which are more consumption centric rather than into export-based industries. As the government consumption expenditure increases, trade balance for both countries is enlarged. Although the coefficient values for both countries are minimal but significant. The findings support Duasa (2007), found that increase in income encourages more demand for goods and therefore worsens the trade balance. Similarly, Kayhan & Bayat (2013), Cavallo (2007) found that increased government spending can lead to higher domestic expenditure, and if the government expenditure increases without corresponding increase to national income trade balance deteriorates as higher domestic expenditure is fulfilled by larger import of goods. As per our findings, long run relationship does exist in context to Pakistan, but the findings are significant and negative which similar to the findings of Duasa (2007).

6. Conclusion and Policy Implications

The study has examined the effect of macroeconomic variables on trade balance in Nepal and Pakistan. Trade balance trials the country's potential for growth and advancement. Stating that the economy could not excel growth due to low capital formation. It is ruled out as the foreign investment inflow trend does not support trade balance in the context of Pakistan. High inflow of capital has not been supported for trade balance and GDP growth. Foreign direct investment has only encouraged import rather than export. These effects are seen minimal in the Nepalese economy. Likewise, the government consumption expenditure neither supports nor undermines the trade balance, indicating minimal effect throughout the period.

Further the study tends that government consumption expenditure tends to have a negative and significant effect on trade balance of the country, indicating that higher government expenditure only tends to degrade the country's trade balance. So, the government must focus on formulating a more contractionary fiscal policy where aggregate demands are decreased, as most of the domestic demands are fulfilled via export while simultaneously policies encouraging more domestic production through subsidies and incentives must be brough leading to infrastructure development and self-reliance. As both countries rely heavily on imports to meet their consumption needs, the problem can mitigate the demand for imported goods by restricting the government spending. Decrease in expenditure would decrease the

overall import volume and encourage a maintain trade balance. Although development needs circulation of capital in the market. However foreign direct investment was found to be insignificant for both countries, giving an insight that the governments must focus more on encouraging domestic production rather than promoting the inflow of foreign capital to maintain trade balance. The insignificance of FDI depicts inability and inefficiency to generate greater output although larger FDI are secured. Taking this into consideration at a policy level, government can avoid formulating policies that extremely favor FDI. Finally, in the case of real exchange rates, devaluation of currency being highly significant. The coefficient value being lower suggests that the trade surplus can only be obtained if the currency is devalued by a huge margin which is not suggested for the country. As both countries still tend to rely much on imported consumable goods, raw materials, capital and operational goods, the scarcity of larger exportable goods only positions both countries at loss. The devaluation increases imports cost by ten times while both countries lack exportable goods to maintain current account balance. By incorporating all these findings, future research could offer deeper insights and more comprehensive models of trade balance.

The findings can be useful for policy makers and regulatory bodies to enhance their monetary and fiscal approach to the trade balance of the country. The study suggests having a more contractionary policy considering the country's negative current account balance. As larger injections of capital do not always result in production growth, as failure to maintain the demand domestically results in fulfillment of demand via larger import. Although higher income is a key factor in improving the quality of life among the citizens, countries with larger trade deficits with increased income only encourage more demand for goods resulting in larger import and worsening trade balance. Further it suggests policy makers to emphasize more on motivating companies to produce import substitution products domestically and reduce import and formulate policy that favors export of goods rather than focusing on dramatically increasing the foreign investment with no planned course of action. By implementing these recommendations, policymakers and regulatory bodies can play a crucial role in shaping a more supportive and efficient economic landscape. This, in turn, can lead to improved trade policies and standardized ecosystem while having a stable and growth-oriented economic approach.

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