AN INVESTIGATION OF FACTORS AFFECTING THE BALANCE OF TRADE IN SRI LANKA

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Abstract

This study investigates the determinants affecting Sri Lanka's trade balance (TB) using time series data from 1990 to 2020. It explores key macroeconomic variables, including inflation (INF), foreign direct investment (FDI), gross domestic product (GDP), exchange rate (ER), tariffs (TFF), and broad money (BM), employing techniques such as the ADF unit root test, ARDL approach, CUSUM plot test, and long-run test. The results reveal that, in the long run, tariffs positively influence the trade balance, while inflation, GDP, and the exchange rate have a negative impact. In the short run, only the exchange rate shows a significant effect. These findings highlight the crucial role of macroeconomic factors in shaping Sri Lanka's trade balance, offering valuable insights for policymakers to develop strategies that could improve the country's economic stability.

Keywords: Business ARDL Approach, Balance of Trade, Exchange, Sri Lanka

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1. Introduction

The trade balance, or the difference between a country's exports and imports over a specific period, is a critical indicator of a nation's economic health. It can result in either a trade surplus or deficit, depending on whether exports exceed imports or vice versa. Understanding the dynamics between exports and imports is vital for assessing the overall economic balance and payment stability of a country. The trade balance not only reflects the current economic performance but also has long-term effects on a nation's foreign exchange reserves, debt levels, and economic growth prospects.

Sri Lanka has historically experienced a continuous trade deficit, marking one of the significant challenges facing its economy. According to historical data, Sri Lanka recorded a negative trade balance in most of the last sixty years, with only a few exceptions during 1950, 1951, 1954, 1956, and 1977. This ongoing deficit trend, particularly in recent decades, has raised concerns about its macroeconomic implications, highlighting the need to closely examine the factors influencing this issue.

Several researchers have studied Sri Lanka's trade balance over the years. Pushpakumara and Kumari (2009) conducted an empirical analysis on the determinants of Sri Lanka's trade balance, identifying key economic variables influencing this imbalance. More recently, Malith et al. (2021) expanded upon this idea, examining the determinants of Sri Lanka's trade balance with its major trading partners. Despite these studies, Sri Lanka continues to face a large trade deficit, exacerbated by a severe economic crisis in recent years. In 2021, the country's trade deficit stood at $-6.54 billion, accounting for -7.36% of GDP. Policymakers are actively seeking solutions to mitigate this deficit, but the potential effects of current macroeconomic policies on the trade balance require careful analysis.

Given the magnitude of the trade imbalance and its connection to broader economic challenges, understanding the macroeconomic determinants that influence Sri Lanka's trade balance is crucial. If these factors are not addressed appropriately, the ongoing trade imbalance could exacerbate the current economic crisis. Numerous studies have attempted to investigate the determinants of trade balance in Sri Lanka, yet gaps remain in understanding specific macroeconomic variables, such as the role of tariffs. This study aims to fill these gaps and provide policymakers with insights into developing effective strategies to manage the trade deficit.

2. Literature Review

The trade balance has long been a focal point of economic research, particularly for countries experiencing chronic deficits. Several macroeconomic variables are frequently analyzed in relation to the trade balance, including inflation, gross domestic product (GDP), exchange rates, foreign direct investment (FDI), and tariffs. These variables play crucial roles in shaping a country's trade dynamics and, by extension, its overall economic performance.

Research on Sri Lanka's trade balance is well-documented. Pushpakumara and Kumari (2009) conducted an empirical analysis to explore the determinants of Sri Lanka's trade balance, focusing on macroeconomic variables and their long-term impact. They highlighted factors such as inflation, GDP growth, and exchange rates as key influences on the trade balance. Malith et al. (2021) revisited these findings,

expanding the scope by analyzing Sri Lanka's trade balance with major trading partners. They also identified several macroeconomic variables that have a significant impact on trade deficits, including tariffs, exchange rates, and GDP growth.

International studies also provide relevant insights into the factors affecting trade balances in other countries. Studies conducted in developing economies often find that high inflation, unfavorable exchange rates, and low GDP growth negatively affect trade balances, as these factors typically reduce export competitiveness while increasing the cost of imports. Tariffs, on the other hand, are often cited as a positive influence on the trade balance, as they can protect domestic industries and reduce imports in the short term. However, overly restrictive tariffs can also lead to retaliatory measures from trading partners, further complicating trade relations.

Despite the existing literature on Sri Lanka's trade balance, few studies have examined the role of tariffs and their direct effect on trade deficits. Furthermore, while inflation, GDP, and exchange rates are widely recognized as significant determinants, their short-term versus long-term impacts require further clarification. This study seeks to fill these gaps by analyzing how these macroeconomic factors, particularly tariffs, influence Sri Lanka's trade balance over time.

By focusing on time-series data from 1990 to 2020 and using advanced econometric techniques, this study will contribute to the literature on Sri Lanka's trade balance by offering a more comprehensive understanding of the macroeconomic variables at play. It aims to provide policymakers with valuable insights to guide economic strategies in addressing the trade deficit and improving the country's overall economic outlook.

Objectives

The primary objective of this study is to identify the impact of macroeconomic variables considered in the short run and long run on Sri Lanka's trade balance.

Research Purpose

The primary purpose of this research is to investigate and analyze the key macroeconomic factors influencing Sri Lanka's trade balance over time. Given Sri Lanka's persistent trade deficit and the recent economic crisis, this study aims to provide a comprehensive understanding of how variables such as inflation, gross domestic product (GDP), exchange rates, foreign direct investment (FDI), tariffs, and broad money supply (BM) impact the trade balance both in the short and long run. The study will address the gaps in the existing literature by incorporating variables that have not been thoroughly explored, such as tariffs, and provide insights that could help policymakers design effective strategies to mitigate the country's trade deficit and improve overall economic health.

Research Questions

1. What are the primary macroeconomic factors that influence Sri Lanka's trade balance?
2. How do these macroeconomic factors affect Sri Lanka's trade balance in the long run?

3. How do these macroeconomic factors affect Sri Lanka's trade balance in the short run?
4. What role do tariffs play in influencing Sri Lanka's trade balance, and how do they compare with other determinants?
5. What policy recommendations can be made based on the study's findings to improve Sri Lanka's trade balance?

By addressing these questions, the study will provide valuable insights into the key drivers of Sri Lanka's trade deficit and offer policymakers strategic guidance to address the ongoing economic challenges.

Research Hypotheses

H0: Inflation (INF) has no significant impact on Sri Lanka's trade balance (TB).
H1: Inflation (INF) has significant impact on Sri Lanka's trade balance (TB).

H0: Foreign direct investment (FDI) has no significant impact impact on Sri Lanka's trade balance (TB).
H2: Foreign direct investment (FDI) has significant impact impact on Sri Lanka's trade balance (TB).

H0: Gross Domestic Product (GDP) has no significant impact impact on Sri Lanka's trade balance (TB).
H3: Gross Domestic Product (GDP) has significant impact impact on Sri Lanka's trade balance (TB).

H0: Exchange rate (ER) has no significant impact impact on Sri Lanka's trade balance (TB).
H4: Exchange rate (ER) has significant impact impact on Sri Lanka's trade balance (TB).

H0: Tariffs (TFF) has no significant impact impact on Sri Lanka's trade balance (TB)
H5: Tariffs (TFF) has significant impact impact on Sri Lanka's trade balance (TB).

H0: Broad money supply (BM) has no significant impact impact on Sri Lanka's trade balance (TB).
H6: Broad money supply (BM) has significant impact impact on Sri Lanka's trade balance (TB).

These hypotheses will be tested using time series data from 1990 to 2020, employing econometric techniques such as the ARDL model to assess the relationships between the macroeconomic variables and Sri Lanka's trade balance.

The study employs time series data and uses established econometric techniques such as the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests, which enhances the quality and reliability of the analysis. The use of these standard tests to assess stationarity ensures the robustness of the results. Furthermore,

the application of the Autoregressive Distributed Lag (ARDL) model, which is suitable for mixed integration orders (I(0) and I(1)), demonstrates methodological soundness. The study's reliance on data from a reputable source (World Bank) increases its trustworthiness, as it uses accurate and globally recognized data.

The research provides a clear explanation of its purpose: to identify the macroeconomic factors affecting Sri Lanka's trade balance. The hypotheses are logically derived, and the variables are well defined. The functional relationship between trade balance and the macroeconomic variables (inflation, GDP, exchange rate, tariffs, etc.) is clearly articulated. However, further clarification regarding some terms and assumptions would benefit readers unfamiliar with economic jargon. Overall, the methodology and approach are described in sufficient detail, ensuring transparency in the research process.

The use of time series data from 1990 to 2020 ensures that the sample period is broad enough to capture significant economic trends and fluctuations, making it appropriate for the analysis. The data set also includes key macroeconomic variables that are likely to influence the trade balance, further strengthening the appropriateness of the sample. By focusing on a long time frame, the study accommodates short- and long-term relationships between the variables, ensuring a comprehensive analysis of Sri Lanka's trade performance.

The data analysis procedures are appropriate for the research objectives. The use of ADF and PP tests to check for stationarity is a standard approach in econometric analysis of time series data. The decision to apply the ARDL model, given the mixed order of integration among variables, is methodologically sound and allows for both short- and long-run dynamics to be examined. The error correction version of the ARDL model is also a suitable choice for capturing long-term equilibrium relationships and short-term adjustments. The study ensures that all variables are properly tested for stationarity and integrated at appropriate levels before moving to the estimation phase.

The study follows a systematic and rigorous approach, using relevant and reliable data, applying suitable econometric models, and providing clear explanations of the methodology and hypotheses. This enhances both the credibility and the practical value of the research findings.

3. Methodology

In this study, Time series data are used from 1990 to 2020, which were extracted from the World Bank database. The study used TB (Trade Balance) as the dependent variable and INF (Inflation), FDI (Foreign direct investment), GDP (Gross Domestic Product), ER (Exchange Rate), TFF (tariff), and BM (Broad money) as independent variables in the following functional form:

$$TB = \int(INF, FDI, GDP, ER, TFF, BM)$$

The above function is expressed as the following multiple linear regression model:

$$TBt = \beta 0 + \beta 1\, INF + \beta 2\, FDI + \beta 3\, GDP + \beta 4\, ER + \beta 5\, TFF + \beta 6\, BM + \varepsilon t$$

Only the GDP variable was transformed into a natural logarithm, while the other variables were used in percentage form in this study.

$$TBt = \beta 0 + \beta 1\, INF + \beta 2\, FDI + \beta 3\, lnGDP + \beta 4\, ER + \beta 5\, TFF + \beta 6\, BM +$$

εt Augmented Dickey-Fuller (ADF) and Phillips Personal (PP) tests are used to check the stationarity of variables. According to the results of ADF and PP tests, four variables namely, INF, FDI, and ER become stationary at level form [I(0)], and other variables namely, TB, LGDP, TFF, and BM are stationary at their difference [I(1)]. It was revealed that the order of integration is mixed with I(0) and I(1). Therefore, we take the ARDL model to estimate the parameters. Error correction version of the ARDL model was used to examine the short-run relationship between variables and long-run adjustment.

Practical Implications

The findings of this study offer several practical implications, particularly for policymakers and economic strategists in Sri Lanka:

1. Policy Formulation for Trade Balance: Understanding the macroeconomic determinants of the trade balance, such as tariffs, exchange rates, and inflation, allows policymakers to create targeted strategies to improve the trade deficit. For instance, the positive impact of tariffs suggests that revising tariff structures could help reduce imports and protect domestic industries, improving the overall trade balance.
2. Monetary and Fiscal Policy Adjustments: The negative impact of inflation and the exchange rate on the trade balance in the long run indicates the need for prudent monetary policies. Keeping inflation in check and stabilizing the exchange rate could improve Sri Lanka's export competitiveness, thereby helping reduce the trade deficit.
3. Long-term Economic Growth Strategies: The role of GDP in influencing the trade balance shows that fostering long-term economic growth is vital for improving trade outcomes. Policies aimed at increasing productivity, diversifying export sectors, and encouraging foreign direct investment (FDI) could contribute to a healthier trade balance over time.
4. Focus on Exchange Rate Policies: The significant short-term impact of the exchange rate highlights the importance of managing currency fluctuations. Policymakers should focus on maintaining a stable exchange rate to avoid adverse short-term effects on the trade balance, particularly during economic crises.
5. Balanced Economic Development: The broad money supply (BM) and inflation variables suggest that macroeconomic stability is essential for improving the trade balance. Therefore, policies that promote balanced economic development, control inflation, and manage money supply growth could help create a more favorable environment for trade.

Theoretical Implications

1. Mixed Integration and ARDL Application: The study's use of the ARDL model, given the mixed order of integration among variables, reinforces the flexibility and effectiveness of the ARDL approach in handling variables with different integration orders. This contributes to the theoretical understanding of how ARDL can be applied in trade balance studies where stationarity issues arise.

2. Macroeconomic Determinants of Trade Balance: By identifying inflation, GDP, exchange rates, and tariffs as significant determinants of Sri Lanka's trade balance, this research adds to the growing body of literature on trade economics. It underscores the importance of these macroeconomic variables and their interconnectedness in shaping a country's trade outcomes.
3. Role of Tariffs in Developing Economies: The study's focus on tariffs as a key variable provides insights into how developing economies like Sri Lanka can leverage tariffs to address trade deficits. This adds to the theoretical discourse on trade protectionism and its potential benefits in specific economic contexts, challenging the notion that lower tariffs universally improve trade balances.
4. Short-run vs. Long-run Dynamics: The differentiation between short-run and long-run effects, especially the significant short-term role of the exchange rate, adds depth to the theoretical understanding of how macroeconomic variables influence the trade balance over different time horizons. This highlights the need for dynamic models that account for both short-term adjustments and long-term trends in trade balance research.

These practical and theoretical insights are essential for informing both policy decisions and future research on the economic determinants of trade balances in developing economies.

4. Results and Discussion

AIC advocates proposed the ARDL (1,0,1,0,1,1,0) demonstrate for this investigation. Concurring to the symptomatic test, the residuals are dispersed ordinarily and not serially connected. Too, there's no specification mistake within the estimated model, and the unsettling influence term within the condition is homoscedastic. Besides, recursive gauges of the CUSUM plot lie inside the upper and lower basic bounds at a 5% importance level, so that the soundness of parameters is established. Agreeing to the comes about of the Bounds test, we will see the esteem of F statistics (5.94428) is more noteworthy than the basic esteem of the upper bound (3.28). Subsequently it is affirmed that there's a long-run relationship between those factors. The comes about of the Bounds test are appeared in Table 1.

Table 1: Results of the Bounds Test

Test Statistic	Value	Significance	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	5.94428	10%	1.99	2.94
K	6	5%	2.27	3.28
		2.5%	2.55	3.61
		1%	2.88	3.99

Next, we can move to the results of the long-run relationship. According to Table 2, tariffs, inflation, gross domestic product, and exchange rate have affected the trade balance in the long run significantly. When it comes to tariffs, we can see there is a positive significant relationship between trade balance and tariffs. Therefore, we can say that an increasing tariff can improve the trade balance in Sri Lanka.

In like manner, we can move to the other significant variables. Those 3 variables which are INF, LGDP, and ER effect on TB negatively. According to Pushpakumara and Kumara (2009), the inflation rate has a marginal positive relationship with the trade deficit and is not significant. In that study, they only used data from the 1999 to 2008 period. When it comes to our research, we can see there is a negative significant relationship between inflation and trade balance. For instance, the increase in inflation will negatively affect the trade balance.

There is a positive relationship between the exchange rate and the trade balance that is not a significant factor (Weerasingha and Perera, 2019). According to our results of the long-run relationship, we can see the exchange rate is negatively significant with the trade balance. For example, the exchange rate depreciation negatively affects the trade balance.

Table 2: Results of long run relationship (dependent variable: TB)

Constant	FDI	LGDP	ER	TFF	BM	INF
5.9806	-0.0315	-0.2023	-30.712	-0.0062	0.0023	-0.0038
(0.000)	(0.172)	(0.000)***	(0.003)***	(0.072)*	(0.238)	(0.071)*

Note: Probability values are given in parentheses. *, **, and *** indicate variables are significant at 10%, 5%, and 1% level of significance, respectively.

Finally, we can move to the results of the short-run relationship and long-run adjustment. According to Table 3 below, only the exchange rate has a significant impact on the trade balance in the short run. That is, there is a negative relationship between the exchange rate and trade balance. However, the previous year's exchange rate has affected the trade balance positively.

Table 3: Results of short-run relationship and long run adjustment
Panel A: Short-run Coefficients

Lag	ΔTB	ΔINF	ΔFDI	ΔLGDP	ΔER	ΔTFF	ΔBM
0		-0.0022	-0.0141	0.0035	-55.622	0.0002	-0.0009
		(0.346)	(0.485)	(0.538)	(0.027)**	(0.950)	(0.678)
1	1.0171		0.0023		45.732	0.0042	
	(0.000)		(0.912)		(0.021)**	(0.226)	
Panel B: Error Correction Representation							
ECT(-1)= - 0.0863982(0.0280)**							

Note: Probability values are given in parentheses. *, **, and *** indicate variables are significant at 10%, 5%, and 1% level of significance, respectively.

Table 3 reveals that the coefficient of ECT is negative and significant, which implies that the TB model can get back to the long-run steady state line with a speed of 86.39% in each period one period after the exogenous shock.

5. Conclusion and Policy Recommendations

The main objective of this study was to identify the factors that affect the trade balance (TB) in Sri Lanka. According to the long-run results Tariff, Inflation, GDP and Exchange Rate affect TB in Sri Lanka. Meanwhile, tariffs positively affect the trade balance. On the other side Inflation, GDP, and Exchange rate negatively affect in the long run. However, only ER has a significant impact in the short run in Sri Lanka.

According to the results of the study, macroeconomic variables such as GDP, exchange rate, tariffs, and inflation can be considered as the main determinants that influence the trade balance in Sri Lanka. Therefore, focusing on these factors in the short term, a formal program that includes medium and long term policies should be created and implemented formally. In particular, to increase the domestic product in the country, instead of restricting imports, it is timely to focus on the establishment of import substitution industries while focusing on a formal export diversification program. Even if the GDP increases in the long run, the demand for the domestic product will decrease and the demand for imports will further increase. Therefore, the trade balance takes a negative value in the long run. As a solution to this, policymakers need to formulate policies focusing on the tariff policy. By reducing imports and increasing exports, the balance of trade can be improved.

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