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Determinants of International Trade: Nepalese Perspectives

Bibhu Prasad Aryal
Former Director, Nepal Rastra Bank

Abstract

This article aims to identify and analyze the economic determinants that directly influence Nepal's international trade activities. The analysis is divided into import and export models, utilizing secondary sources of annual data from July 1975 to July 2023. The study employs regression analysis to identify the relationships between the dependent and independent variables affecting trade performance. The regression model for imports (Model A) indicates that real GDP and the consumer price index (CPI) of India have significant positive effects on imports, with coefficients of 1.59 and 1.47, respectively, both statistically significant at the 1% level. Conversely, remittances show a strong negative effect on imports, with a coefficient of -0.13. For exports (Model B), the analysis reveals relationships between exports and three independent variables: the CPI in India, exchange rate, and real GDP. The CPI in India has a coefficient of -6.496, highly significant ($p = 0.0000$), indicating that a 1% increase in the CPI leads to approximately a 6.50% decrease in exports, highlighting a strong negative impact of rising prices in India on exports to Nepal. By addressing the identified economic determinants, policymakers can develop strategies to improve Nepal's international trade dynamics and overall economic resilience.

Keywords: international trade, import, export, economic growth, GDP, remittance, exchange rate

Article Info.

Corresponding Author
Bibhu Prasad Aryal

Email
bibhuaryal@gmail.com

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Introduction

International trade refers to the exchange of goods and services between organizations based in different countries, encompassing a wide range of products such as raw materials, consumer goods, machinery, and food. This exchange allows nations to expand their trade markets and access goods and services that may not be available domestically. International trade enhances cross-border exchanges by improving the reliability of supply chains and logistics while simplifying customs procedures, making it vital for stimulating economic growth on both local and global scales. Furthermore, international legal frameworks, including international trade law and international investment law, significantly bolster cross-border trade (University of Lincoln, 2022). Engaging in foreign trade often leads to increased market competition, resulting in more reasonably priced and competitively priced goods and services. The significance of international trade lies in its contribution to a nation's economic development and progress. By opening new markets for domestic businesses, international trade leads to increased output, economies of scale, and job creation. Exporting products and services helps nations boost their GDP and cash flow, which can then be used to finance infrastructure, healthcare, and education, all of which support national growth. Additionally, trade enables countries to access resources that may not be available within their borders, including raw materials, natural resources, and advanced technologies. Through economies of scale and competitive pressures, trade makes a wider range of

goods and services more affordable for consumers, ultimately enhancing living standards. Participating in international trade allows countries to focus on producing goods and services where they hold a comparative advantage. This specialization leads to increased productivity, higher-quality output, and more efficient resource utilization (Fransisco et al., 2020). For instance, given its favorable agricultural conditions, Nepal can focus on exporting its agricultural products while importing manufactured goods. Moreover, international trade strengthens diplomatic and economic ties between nations, increasing interdependence and fostering stronger political and economic relationships. However, various economic variables influence international trade, including a country's Gross Domestic Product (GDP), remittances, international prices, and exchange rates. GDP reflects a nation's overall economic health and production capacity, while remittances can enhance household purchasing power, thereby affecting trade dynamics. International prices influence the competitiveness of a country's exports and imports, and exchange rates determine the relative cost of goods and services traded across borders. Together, these economic indicators shape the patterns and volume of international trade, driving economic interactions between nations. In Nepal, international trade significantly influences the economy, particularly in terms of imports. This dependency is largely driven by remittances, which provide a substantial influx of foreign currency, boosting household incomes and increasing demand for imported goods and services (Smanta & Yadav, 2021; Ghimire, 2010; Thagunna & Acharya, 2013; Kafle, 2006).

Other critical determinants, such as GDP, international prices, and exchange rates, also play vital roles in shaping Nepal's trade dynamics. The scale of imports in Nepal vastly outweighs that of exports, primarily driven by remittances, international prices, exchange rates, and GDP. Remittances inject substantial foreign currency into the economy, impacting the trade balance, especially in developing countries (Matuzeviciute & Butkus, 2016). International prices affect the cost and availability of goods on the global market, influencing the attractiveness of imports. Exchange rates impact the relative value of the national currency, altering the affordability and competitiveness of imported versus domestically produced goods. Together, these factors contribute to Nepal's heavy reliance on imports, highlighting the complex economic interplay that shapes the nation's trade landscape (Rivera-Batiz et al. 2020). Despite the minimal volume of exports compared to imports, several determinants influence Nepal's export sector. Key among these are GDP, international prices, and capital stock. A higher GDP typically indicates a more productive economy capable of generating goods and services for export. International prices shape the competitiveness of Nepalese products in the global market, where higher prices can diminish export competitiveness, while lower prices can enhance export appeal. Lastly, the capital stock, which includes infrastructure and industrial capacity, directly affects the ability to produce and export goods efficiently. Together, these factors contribute to the relatively small scale of Nepal's export sector, underscoring the need for strategic improvements to balance trade.Additionally, exchange rates play a crucial role in export activities. A stronger currency can make a country's goods more expensive and less competitive in the international market, reducing the likelihood of increased exports. Conversely, a weaker currency can make exports more attractive by lowering prices for foreign buyers, potentially boosting export volume.

Problem Statement

Mishra (2021 a&b) suggests that maintaining stable economic policies and promoting sustainable growth are essential for optimizing Nepal's trade performance and achieving a balanced trade structure. Nepal's economy is characterized by a significant imbalance between imports and exports, with imports vastly exceeding exports. This imbalance is influenced by several economic determinants, including remittances, international prices, exchange rates, and GDP. While remittances provide a substantial influx of foreign currency, boosting domestic demand, they also contribute to increased reliance on imports. International prices affect the cost and availability of goods, while exchange rates influence the competitiveness of

Nepalese exports and the affordability of imports. Despite the importance of international trade to Nepal's economic development, there is a lack of comprehensive analysis regarding the specific economic determinants affecting trade dynamics. Existing literature has primarily focused on the general impact of trade on economic growth, without delving into the intricate relationships between these determinants and their implications for Nepal's trade balance. Therefore, this study aims to fill this gap by examining the key economic variables that influence Nepal's international trade, providing insights into the underlying factors contributing to the trade imbalance.

Research Objectives

The objective of this empirical study is to identify and analyze the economic factorss that directly influence Nepal's import and export activities. By examining key determinants such as GDP, remittances, international prices, exchange rates, and Capital Stock the study aims to provide a comprehensive understanding of the variables that impact Nepal's international trade dynamics. This analysis will help in formulating targeted strategies to enhance trade performance and promote sustainable economic growth.

Literature Review

Acharya S. (2012) identifies in his studies which explores the factors influencing Nepal's trade (exports, imports, and trade balance) using and extended gravity model, offering specific trade policy recommendations to boost foreign trade. According to the gravity model, trade between nations is directly proportional to their GDPs and inversely proportional to the distance between them. Using panel data from 21 major trade partners over six years, the study found that Nepal's exports and imports are influenced by the real GDP of its trade partners. An increase in trade partners' GDP boosts both exports and imports, with exports growing at a higher rate. However, the article has also identified that Nepal's trade deficit continues to grow as its imports surpass its exports in absolute terms. Nepal engages in more trade with SAFTA countries and has fewer imports from OECD countries. Distance negatively impacts trade, confirming the gravity model's premise.

Bista N.B. and Adhikari K (2021) have investigated the factors influencing foreign trade in Nepal with a focus on exports and imports as the dependent variables. The independent variables considered include Nepal's GDP, the GDP of its trading partners, the real effective exchange rate, distance, regional economic integration, per capita GDP, and the economic freedom indices of both Nepal and its trading partners. By using secondary type of data from 21 different trading partners for the period of 2010-2019, the regression models reveal that higher GDP in Nepal and its trading partners, a higher real effective exchange rate, and SAFTA membership positively impact exports. Distance negatively impacts both exports and imports, while economic freedom in trading partners boosts exports. Additionally, GDP per capita differential and trading partners' GDP positively influence imports. The findings highlight the significant role of economic growth, distance, and regional integration in shaping Nepal's international trade.

Sharma S. (2020) examined the dynamics and challenges of foreign trade in Nepal, aiming to identify its direction and potential for expansion for period of less than a decade, that is, from fiscal year 2011/12 to 2018/19. Using quantitative date from secondary sources, including physical libraries and online database, the research reveals that the majority of Nepal's foreign trade is concentrated with India. The findings reveal a persistent trade deficit, characterized by declining exports and rising imports, resulting in an increasingly negative trade balance each year. Additionally, the study underscores Nepal's heavy reliance on India for trade, suggesting the need for diversification to engage with a broader range of global markets.

Contextual Significance in Context of Nepal

Nepal's lower GDP growth hampers its ability to compete in international markets, as slow economic expansion often leads to reduced investment in infrastructure and innovation. This can result in lower productivity and a diminished capacity to produce goods and services for export, ultimately weakening the country's trade balance.

Rising international prices increase the cost of imports for Nepal, straining the trade balance and raising production costs for businesses reliant

on imported goods and raw materials. This can lead to higher prices for consumers and reduced competitiveness for Nepalese exports, as local products become more expensive on the global market.

Similarly, a volatile exchange rate creates uncertainty for both exporters and importers in Nepal. Fluctuating currency values make it difficult to predict costs and revenues, which can discourage international trade. Businesses may face challenges in pricing their goods competitively and managing costs, leading to reduced trade volumes and increased financial risk.

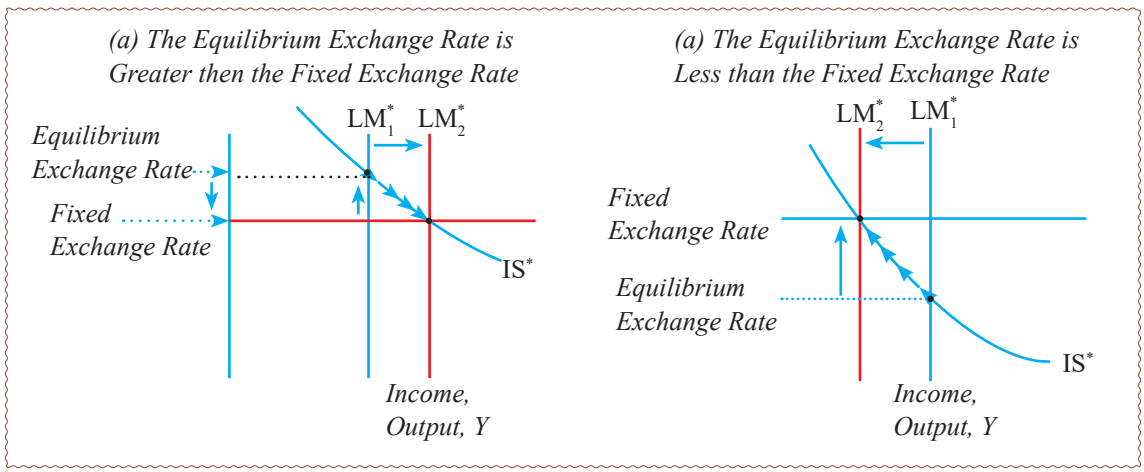
Nepal has been experiencing exchange rate depreciation volatility since the beginning. Nepal pegged the Nepali Rupee (NPR) to the Indian currency in 1960. In the past, the pegged rate was changed periodically; however, for more than three decades, this rate has not been adjusted. Therefore, it is essential to discuss the theoretical concept of exchange rate determination in a small open economy that has adopted a fixed exchange rate regime.

In a fixed exchange rate system, the central bank is ready to buy or sell the local currency for foreign currencies at the previously determined rate ensuring the country maintains its exchange rate at this fixed level. The central bank effectively guarantees to adjust the money supply to keep the exchange rate consistent with the market rate. When there's a discrepancy between supply and demand for foreign currency, the central bank intervenes by trading currencies at the fixed rate, thereby stabilizing the exchange rate automatically through these transactions (Saylor.org,).

The theory further clarifies the use of IS-LM curves for two different situations: when the equilibrium exchange rate exceeds the fixed exchange rate, and when it is lower than the fixed exchange rate. These situations are clearly explained by Professor Mankiw in his macroeconomics textbook (2009), which is presented below:

Figure 1

1 Fixed Exchange Rate and Money Supply



Source: Macroeconomics Text Book, N Gregory Mankiw, 9th Edition, page 351.

In above figure 1(a) it can be observed that the equilibrium exchange rate initially exceeds the fixed level. In such a situation, arbitrageurs buy foreign currency in foreign-exchange markets. After having such transactions, they sell it to the central bank for a profit. This process automatically increases the money supply which shifts the LM* curve to the right and lowers the exchange rate.

In above figure 1(b), we can see that the equilibrium exchange rate is initially lying below the fixed level. In such a situation, arbitrageurs buy domestic currency in foreign-exchange markets

and use such local currency to buy foreign currency from the central bank. This process automatically reduces the money supply which shifts the LM* curve to the left and raises the exchange rate.

The significance of studying international trade and its determinants in Nepal lies in its potential to provide crucial insights for enhancing the country's economic performance. Given Nepal's current challenges of lower GDP growth, volatile exchange rates, and rising international prices, understanding the factors that influence international trade is essential for formulating effective economic policies. This research can help identify the key drivers and barriers to trade, offering a clearer picture of how Nepal can better integrate into the global market. By analyzing the impact of variables such as GDP, remittance inflows, exchange rate, and international prices, policymakers can develop strategies that best suits to maintain the overall trade balance of the country.

Methodology

The methodology is divided into several sections to enhance readability and comprehension. These sections are designed to be easily understood by all readers. The components are outlined below:

Data Sources

This study primarily utilizes secondary data sourced from several reputable institutions. The data were obtained from the Nepal Rastra Bank (NRB), Ministry of Finance (MoF), Central Bureau of Statistics (CBS), the World Bank (WB), International Monetary Fund (IMF), and the Reserve Bank of India (RBI). These sources provide reliable and comprehensive information essential for analyzing the determinants of Nepal's imports and exports.

Time Series Data

The study employs a time series data set on an annual basis spanning from 1975 July to 2023 July. This extensive data set offers a robust foundation for identifying trends and patterns over a significant period. By covering nearly five decades, the study can capture long-term dynamics and the impacts of various economic factors on Nepal's trade activities.

Model 1: Determinants of Imports

The first model in this study focuses on imports being the dependent variable. Further, the independent variables considered in this model include GDP, international (India) as well as domestic prices, and remittances. The rationale behind selecting these variables lies in their significant influence on import behavior. GDP reflects the overall economic activity, international prices indicate the cost of goods on the global market, domestic prices allows for a comprehensive analysis of the factors driving import demand, and finally remittances represent income from abroad.

Model 2: Determinants of Exports

In the second model, exports are treated as the dependent variable. Where, the independent variables for this model are, international prices (CPII/CPIN), Exchange rate (NPR with USD), and capital stock. Where, international prices reflect the competitiveness of Nepalese goods in the global market, exchange rate serves as a crucial indicator in an export model by affecting the price competitiveness of exports, and capital stock represents the investment in productive assets that can enhance export capabilities.

Data Analysis Techniques

To analyze the data, the study employs various econometric techniques. Regression analysis is employed to estimate the relationships between the dependent and independent variables. This involves testing for autocorrelation on error term, multicollinearity among the independent variables using unit Ordinary Least Square (OLS) method, ensuring that the time series data are suitable for regression result analysis. These steps are crucial for analyzing the results and ensuring the robustness of the findings.

Hypothesis

Model A: Imports

GDP and Imports: It is hypothesized that there is a direct positive relationship between Nepal's Gross Domestic Product (GDP) and the volume of imports. As GDP increases, indicating economic growth, the overall demand for goods and services—including imports—is expected to rise due to enhanced economic activity and increased consumer purchasing power.

Remittances and Imports: The hypothesis posits that remittances have a positive relationship with imports. An increase in remittances translates to higher disposable income for households, which boosts their purchasing power and, consequently, their demand for imported goods. Thus, higher remittance inflows are expected to correlate with increased import levels.

Consumer Price Index (CPI) of India and Imports: It is anticipated that the CPI of India will have a significant negative relationship with imports. As the CPI in India rises, indicating that foreign goods have become relatively more expensive, the volume of imports is likely to decrease. This inverse relationship suggests that higher international prices can discourage imports, as consumers may seek cheaper alternatives or reduce their overall consumption.

Domestic Prices and Imports: The hypothesis suggests that there is a positive relationship between domestic prices and imports. As domestic prices increase, indicating that locally produced goods have become more expensive, the volume of imports is likely to rise. This positive correlation implies that higher domestic prices encourage consumers and businesses to seek more affordable options from international markets.

Model B: Exports

International Prices and Exports: It is hypothesized that there is a positive relationship between the ratio of international prices and Nepal's export levels. As international prices increase, the competitiveness of Nepalese goods in the global market is expected to rise, leading to an increase in exports. This direct relationship indicates that higher international prices can make exports from Nepal more attractive to foreign buyers.

Exchange Rate and Exports: The hypothesis posits a negative relationship between the exchange rate and export levels. When the Nepalese Rupee (NPR) depreciates, making Nepalese goods cheaper for foreign buyers, the demand for exports is expected to increase. Therefore, a weaker domestic currency is anticipated to boost export volumes.

Capital Formation and Exports: It is expected that capital formation has a positive relationship with exports. Higher levels of capital formation indicate greater investment in productive assets, infrastructure, and technology, which enhance the quality and quantity of goods produced for export. Consequently, substantial capital formation is hypothesized to support increased export activities.

Model Specification and Estimation

The specific form of the regression models is carefully specified to capture the relevant economic relationships. For the import and export model, the equation can be represented as:

Import Model (Model A)

$$Mt=\beta_0+\beta_1 GDPt+\beta_2 REMt+\beta_3 PRIt+\beta_4 PRNt+\epsilon t$$

Where,

M = Import at annual amount
α = Intercept term
GDP = Real GDP at annual amount
REM = Remittance at annual amount
PRI = Price of India (CPIIndia)
PRN = Price of Nepal (CPINepal)
$\beta_1,\beta_2,\beta_3,\beta_4$ = Coefficients of GDP, REM, PRI and PRN respectively
t = period at annual rate
∈ = Error term

Export Model (Model B)

$$\mathbf{Xt = \beta_0 + \beta_1 IPt + \beta_2 ERt + \beta_3 CSt + \epsilon t}$$

Where,

X = Export at annual amount
α = Intercept term
IP = International Price (CPIIndia/ CPINepal)
ER = Exchange Rate (NPR with USD)
CS = Capital Stock (Gross Fixed Capital Formation in real term)
β_1,β_2,β_3 = Coefficients of IP, ER and CS respectively
t = period at annual rate
∈ = Error term

Validity, Reliability and Implication of the Study

The validity and reliability of the study are ensured through the use of high-quality data sources and rigorous analytical methods. By cross-referencing data from multiple reputable institutions, the study minimizes the risk of inaccuracies. Moreover, the extensive time frame

and thorough scope of the data set enhances the reliability of the analysis. The results of this study are expected to offer significant insights into the economic factors influencing Nepal's foreign trade. Understanding these relationships can help policymakers formulate strategies to enhance trade performance, address trade imbalances, and promote sustainable economic growth.

In model A, to determine the actual relationship between the dependent variable (import) and the independent variables (GDP, remittances, international price (India), and domestic price), a regression analysis is performed. This analysis employs the Ordinary Least Squares (OLS) method, which is a widely used econometric techniques for estimating the predetermined parameters of a linear regression model. It's also true that OLS operates by minimizing the sum of the squared differences between the observed values and the values predicted by the designed model thereby providing the best linear unbiased estimates of the relationships among the variables.

In this analysis, rather than using percentage changes, the actual levels (amounts) of the variables have been utilized where applicable. This method enables a more straightforward interpretation of how changes in the GDP, remittances, international price, and domestic price influence imports. The study attempts to capture the concrete influence of these financial flows on economic growth by providing further clarity on the extent of these interactions.

Similarly in model B, the OLS approach is used in a regression analysis to ascertain the true link between the dependent variable (export) and the independent variables (remittances, ratio of international prices, exchange rate, and capital formation).

Like in model 'A,' the actual levels (amounts) of the variables have been used in this analysis when appropriate, in place of percentage changes. This approach makes it easier to understand how shifts in capital formation, exchange rates, international price ratios, and remittances affect exports. By shedding more light on the magnitude of these relationships, the study aims to quantify the specific impact of various economic factors on exports.

Also, in the both models, we have used logarithms on the data to make the results smoother and deal with issues like uneven variability and non-linear patterns. Logarithms help make the relationship between variables more straightforward and stable. This modification ensures that our regression model produces more accurate findings that accurately reflect the functioning of the economy.

Results and Discussion

Table 1

The Regression Model Import Being Dependent Variable

Dependent Variable: LOG(IMPORT), **Method:** Least Squares, **Included observations:** 49				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	-8.194247	4.847750	-1.690320	0.0980
LOG(RGDP)	1.102889	0.403345	2.734354	0.0090
LOG(REMITTANCES)	-0.071108	0.038479	-1.847954	0.0713
LOG(CPII)	0.005196	0.542961	0.009570	0.9924
LOG(CPIN)	1.476253	0.519155	2.843571	0.0067

Variable	Coefficient	Std. Error	t-Statistic	Prob.
R-squared	0.998182	Mean dependent var	11.16089	
Adjusted R-squared	0.998016	S.D. dependent var	2.126368	
S.E. of regression	0.094705	Akaike info criterion	-1.779644	
Sum squared resid	0.394640	Schwarz criterion	-1.586601	
Log likelihood	48.60128	Hannan-Quinn criter.	-1.706404	
F-statistic	6038.368	Durbin-Watson stat	1.152841	
Prob(F-statistic)	0.000000			

The result of this model (Import being dependent variable) is presented in table– 1. The regression model indicates that real GDP (LOG(RGDP)) and the consumer price index - Nepal (LOG(CPIN)) have significant positive effects on imports, with coefficients of 1.103 and 1.476, with p-value 0.0090 and 0.0067 respectively, both statistically significant at the 1% level. Remittances (LOG(REMITTANCES)) have a marginally significant negative effect on imports, with a coefficient of -0.071, significant at the 10% level. The consumer price index - India (LOG(CPII)) does not significantly impact imports. Even though the model explains 99.82% of the variance in imports (R-squared = 0.998), indicating a very good fit, the insignificant coefficient of LOG(CPII) prevents a detailed explanation of the result. The statistical insignificance of this coefficient might have happened due to the problem of multicollinearity. Therefore, a correlation matrix between LOG(CPII) and LOG(CPIN) is run and the result reveals a strong correlation (0.998, as shown in Table- 2) between these two. The literature has mentioned that when the correlation is greater than 0.8, then a severe multicollinearity may be present (Simon Fraser University). Consequently, LOG(CPIN) is dropped from the model, and the regression is re-run with the inclusion of a dummy variable (COVID) to capture the possible effect of COVID-19 on imports.

Table 2

Correlation Matrix between CPIN and CPII

	CPII	CPIN
CPIN	0.998329	1
CPII	1	0.998329

The result of regression (Table– 3) shows that real GDP (LOG(RGDP)), remittances (LOG(REMITTANCES)), and the consumer price index in India (LOG(CPII)) significantly influence imports, with LOG(RGDP) and LOG(CPII) having positive impacts and LOG(REMITTANCES) having a negative impact. The dummy variable for COVID-19 (DUM_COVID) does not have a statistically significant effect. Therefore, the decision is made to drop (DUM_COVID) from the model and then to re-run the model.

Table 3

The Regression Model Import Being Dependent Variable

Method: Least Squares, **Included Observations:** 49				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	-15.57504	4.804404	-3.241826	0.0023
LOG(RGDP)	1.643726	0.414985	3.960930	0.0003
LOG(REMITTANCES)	-0.133004	0.035521	-3.744345	0.0005
LOG(CPII)	1.451043	0.192073	7.554625	0.0000
DUM_COVID	-0.032023	0.081269	-0.394038	0.6955
R-squared	0.997855	Mean dependent var		11.16089
Adjusted R-squared	0.997660	S.D. dependent var		2.126368
S.E. of regression	0.102859	Akaike info criterion		-1.614462
Sum squared resid	0.465520	Schwarz criterion		-1.421419
Log likelihood	44.55432	Hannan-Quinn criter.		-1.541222
F-statistic	5117.288	Durbin-Watson stat		1.015590
Prob(F-statistic)	0.000000			

The result of this model (Table– 4) shows that real GDP (LOG(RGDP)), remittances (LOG(REMITTANCES)), and the consumer price index in India (LOG(CPII)) significantly influence imports having the coefficients of 1.59, -0.13, and 1.47 respectively. Specifically, LOG(RGDP) and LOG(CPII) have positive impacts on imports, while LOG(REMITTANCES) has a negative impact. The coefficients for these variables are statistically significant at the 1% level indicating that a 1% increase in the real GDP, Remittances and CPI in India corresponds to a 1.59% increase, -0.13% decrease, and 1.47% increase in Import. Though there may be some positive autocorrelation in the residuals, the model fits the data very well, explaining 99.78% of the variance in imports.

Table 4

The Regression Model Import Being Dependent Variable

Method: Least Squares, **Included Observation:** 49				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	-15.00127	4.535246	-3.307707	0.0019
LOG(RGDP)	1.594556	0.392047	4.067254	0.0002
LOG(REMITTANCES)	-0.130721	0.034715	-3.765543	0.0005
LOG(CPII)	1.470910	0.183590	8.011933	0.0000
R-squared	0.997847	Mean dependent var		11.16089
Adjusted R-squared	0.997704	S.D. dependent var		2.126368
S.E. of regression	0.101889	Akaike info criterion		-1.651756
Sum squared resid	0.467163	Schwarz criterion		-1.497321
Log likelihood	44.46802	Hannan-Quinn criter.		-1.593164
F-statistic	6953.529	Durbin-Watson stat		1.049328
Prob(F-statistic)	0.000000			

Clarification of Model 'A' Results:

Negative Relation of Remittances with Imports

The results have shown a negative relationship between imports, being dependent variable, and remittances, being, independent variable, contrary to the hypothesis of this study. Possible reasons for this behavior could include: i) A significant portion of remittances might be used to repay debts, leaving less disposable income for purchasing imports. ii) Remittances might have led to a diversification of imports. Additionally, remittances are not solely responsible for the increase in imports in Nepal. Imports might have increased due to factors other than remittances. A possible explanation for this point is that only a portion of Nepali people receive remittances, but imports are influenced by the consumption patterns of all citizens. Therefore, deeper studies on these findings are required, which might be useful for researchers.

Positive Relation of CPI of India with Imports

The results have further shown a positive relationship between CPI in India and imports, contrary to the hypothesis of this study. Possible reasons for this behavior could include: i) Inelastic nature of import from India – Nepal heavily relies on essential goods from India, the demand for these imports might be inelastic in nature. In such a situation, even if the prices rise (as indicated by an increase in CPIN), the quantity of imports may not decrease significantly because these goods are necessities. ii) Rising Income Levels - if remittances or other income sources in Nepal are increasing, this might enhance the purchasing power of Nepalese consumers and businesses, enabling them to maintain or even increase import levels despite rising prices. Therefore, a deep research on these findings are required, which might be useful for researchers and students.

The Econometric Analysis Result of Model B

Table 5

Regression Analysis Export Being Dependent Variable

Method: Least Squares, **Included Observation:** 49				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	0.782971	1.770765	0.442165	0.6605
LOG(CPII/CPIN)	0.436812	1.937328	0.225472	0.8226
LOG(EXRATE)	2.159610	0.267369	8.077270	0.0000
LOG(CAPITALSTOCK)	0.049230	0.130653	0.376798	0.7081
R-squared	0.960152	Mean dependent var		9.750452
Adjusted R-squared	0.957496	S.D. dependent var		1.853118
S.E. of regression	0.382049	Akaike info criterion		0.991572
Sum squared resid	6.568267	Schwarz criterion		1.146006
Log likelihood	-20.29352	Hannan-Quinn criter.		1.050164
F-statistic	361.4331	Durbin-Watson stat		1.053709
Prob(F-statistic)	0.000000			

The result of this model (Export being dependent variable) is presented at table– 5. The regression analysis reveals that the exchange rate (LOG(EXRATE)) is the only significant predictor of exports, with a substantial positive impact. A 1% increase in the independent variable - exchange rate which corresponds to a 2.16% increase in exports, demonstrating the critical influence of exchange rate movements on export performance. In contrast, the constant term, the ratio of consumer price indices (LOG(CPII/CPIN)), and capital stock (LOG(CAPITALSTOCK)) are not statistically significant, indicating they do not meaningfully explain variations in export levels within this model. Despite the lack of significance for most predictors, the high R-squared value suggests that

the model overall fits the data very well, accounting for 96.02% of the variance in exports. This high explanatory power highlights the exchange rate's dominant role while suggesting that other factors not included in this model might also influence exports.

Logarithmically transforming variables in a regression model is a very common way to handle situations where a non-linear relationship exists between the independent and dependent variables (Benoit K. 2021). In order to manage the potential issue of spurious data in the model, a decision is made to differentiate the logarithms (DLOG) of the variables in regression. This step is crucial for several reasons. First, it helps to stabilize the variance and address heteroscedasticity, ensuring more consistent error terms in various levels of the chosen independent variables. Additionally, DLOG transforms relationships between variables into linear forms, making it easier to interpret elasticities directly. Moreover, this approach aids in achieving stationarity in time series data, which is necessary for valid statistical inference and more reliable model estimates.

The Econometric Analysis Result of Model B

Table 6

Result of DLOG Used Model with Dependent Variable: DLOG(EXPORT)

Method: Least Squares, **Included observations:** 48 after adjustments				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	0.044077	0.082479	0.534402	0.5958
DLOG(CPII/CPIN)	-2.223954	2.046390	-1.086770	0.2831
DLOG(EXRATE)	1.812640	0.882960	2.052913	0.0461
DLOG(CAPITALSTOCK)	0.041109	0.336192	0.122279	0.9032
R-squared	0.151265	Mean dependent var		0.159010
Adjusted R-squared	0.093396	S.D. dependent var		0.406136
S.E. of regression	0.386705	Akaike info criterion		1.017347
Sum squared resid	6.579796	Schwarz criterion		1.173280
Log likelihood	-20.41632	Hannan-Quinn criter.		1.076274
F-statistic	2.613946	Durbin-Watson stat		1.362136
Prob(F-statistic)	0.063025			

The result of DLOG used model is presented in table– 6. The regression analysis reveals that the differenced log of the exchange rate (DLOG(EXRATE)) is the only significant predictor of exports, with a positive impact. Specifically, a 1% increase in the exchange rate is related to approximately a 1.81% increase in the exports. The other variables, including the constant term, relative price index ratio (DLOG(CPII/CPIN)), and capital stock (DLOG(CAPITALSTOCK)), are not statistically significant. Further, the model describes only 15.13% of the variance of exports, indicating a relatively poor fit, and some evidences of positive autocorrelation within the residual terms.

Table 7

The Regression Result with Dependent Variable: DLOG(EXPORT)

Method: Least Squares, **Included observations**: 48 after adjustments				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	0.491488	0.110543	4.446119	0.0001
DLOG(CPII)	-5.196836	1.742559	-2.982302	0.0047
DLOG(CPIN)	-2.278072	1.866750	-1.220341	0.2290
DLOG(EXRATE)	3.001112	0.745767	4.024196	0.0002
DLOG(CAPITALSTOCK)	0.334010	0.275617	1.211864	0.2322

Variable	Coefficient	Std. Error	t-Statistic	Prob.
R-squared	0.467217	Mean dependent var		0.159010
Adjusted R-squared	0.417655	S.D. dependent var		0.406136
S.E. of regression	0.309928	Akaike info criterion		0.593381
Sum squared resid	4.130388	Schwarz criterion		0.788298
Log likelihood	-9.241139	Hannan-Quinn criter.		0.667040
F-statistic	9.427054	Durbin-Watson stat		1.618529
Prob(F-statistic)	0.000015			

After finding the result statistically insignificant, again a decision is made to segregate DLOG(CPII/CPIN) into DLOG(CPII) and DLOG(CPIN), and then re-run the regression. The regression result (table– 7) reveals that the exchange rate (DLOG(EXRATE)) and the consumer price index of India (DLOG(CPII)) are significant predictors of exports. Specifically, a 1% increase in DLOG(EXRATE) is connected with approximately a 3.0% rise in exports, while a 1% increase in DLOG(CPII) is related with approximately a 5.2% decrease in exports. The other variables, including the constant term, the consumer price index of Nepal (DLOG(CPIN)), and capital stock (DLOG(CAPITALSTOCK)), are not statistically significant. Further, the model explains only about 46.72% of the variance in the differenced log of exports, indicating a moderate fit, with some evidence of positive autocorrelation in the residuals.

By stepping up ahead, again the decision is made to drop insignificant variables and then to introduce the concerned variable in the model. For achieving the statistically significant result, therefore, DLOG(CPIN) and DLOG(CAPITALSTOCK) are dropped and then DLOG(RGDP) is introduced in the model. While considering exports as the dependent variable and GDP as the independent variable, the relationship often illustrates how a nation's economic output influences its ability to export goods and services. As GDP grows, indicating a more productive and prosperous economy, the capacity for producing exportable goods and services typically increases. Higher GDP can lead to better infrastructure, improved technology, and increased investment in industries that produce goods for international markets. Consequently, an expanding GDP often results in higher exports as the country can produce more competitively priced and higher-quality products. Additionally, economic growth can enhance the business environment, fostering innovation and efficiency, further boosting export potential. Therefore, the relationship suggests that as GDP rises, exports tend to increase due to the enhanced production capabilities and overall economic strength.

Table 9

Result of DLOG Used Model with Dependent Variable: DLOG(EXPORT)

Dependent Variable: DLOG(EXPORT), **Method:** Least Squares, **Included observations:** 48 after adjustments				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	0.352036	0.120328	2.925632	0.0054
DLOG(CPII)	-6.496380	1.267837	-5.123987	0.0000
DLOG(EXRATE)	2.489787	0.663579	3.752057	0.0005
DLOG(RGDP)	3.127667	1.839557	1.700229	0.0961
R-squared	0.470565	Mean dependent var		0.159010
Adjusted R-squared	0.434467	S.D. dependent var		0.406136
S.E. of regression	0.305422	Akaike info criterion		0.545409
Sum squared resid	4.104428	Schwarz criterion		0.701343
Log likelihood	-9.089819	Hannan-Quinn criter.		0.604337
F-statistic	13.03583	Durbin-Watson stat		1.373813
Prob(F-statistic)	0.000003			

The regression analysis result (Table– 8) reveals the relationship between the exports (DLOG(Export)) and three independent variables namely, the consumer price index of India (DLOG(CPII)), the exchange rate (DLOG(EXRATE)), and real GDP (DLOG(RGDP)). The constant term (C) has a coefficient of 0.35, which is statistically significant (p = 0.0054), indicating a positive baseline effect on the exports when all other variables are zero. DLOG(CPII) has a coefficient of -6.496, highly significant (p = 0.0000), suggesting that a 1% increase in the CPII leads to approximately a 6.50% decrease in exports, highlighting a strong negative impact of rising prices in India on exports to Nepal. Another variable DLOG(EXRATE) has a coefficient of 2.49, which is also highly significant (p = 0.0005), indicating that a 1% increase in the exchange rate corresponds to a 2.49% increase in exports, suggesting that a weaker domestic currency boosts export competitiveness. Similarly, the DLOG(RGDP) has a positive coefficient of 3.13 which is only marginally significant (p = 0.0961), implying that a 1% increase in real GDP is associated with a 3.13% increase in exports. The R-squared, which is 0.4706, indicates that about 47.06% of the variability in the exports has been explained by the designed model, signifying a moderate fit. Though the Durbin-Watson statistic of 1.37 suggests some positive autocorrelation in the residuals, the regression results indicate that the model is suitable for making necessary policy recommendations.

Policy Recommendations Based on Model A

The regression analysis highlights the significant influence of real GDP, remittances, and the consumer price index of India on import levels. To leverage these findings for policy-making, it is essential to focus on several key areas. Firstly, promoting sustainable economic growth is crucial. Because by enhancing the overall economic output, the country's capacity for imports can be increased. Secondly, optimizing the use of remittance is vital since it has a negative impact on imports. Policymakers should develop programs that channel remittances into productive investments rather than mere consumption. Thirdly, Given the scenario where the Consumer Price Index (CPI) in India is increasing and imports in Nepal are also rising, indicating inelastic demand for imports, policymakers in Nepal should focus on several strategic measures like mitigating the impact of rising import costs by i) negotiating more favorable trade agreements with India, and by ii) promoting and supporting domestic production which can help reduce dependency on imports. By focusing on these areas, policymakers can effectively harness the positive impacts of economic growth on imports, optimize the use of remittances, and stabilize import prices, ensuring a robust and resilient economic framework.

Policy Recommendations based on model B

Given the regression analysis results, it is evident that rising consumer prices in India significantly negatively impact Nepal's exports, while a weaker domestic currency and increased real GDP positively influence exports. Therefore, policymakers should focus on strategies to mitigate the adverse effects of rising Indian prices, such as exploring alternative markets and enhancing the competitiveness of Nepalese products through quality improvement and cost reduction measures. Additionally, maintaining a favorable exchange rate is crucial to boost export competitiveness, which is likely to achieve from a prudent monetary policy as well as fiscal policy. Efforts to sustain economic growth should also be prioritized, as higher GDP levels positively correlate with increased export levels. By addressing these factors, Nepal can enhance its export performance despite external price pressures.

Conclusion

The econometric analyses of models A and B provide valuable insights into the factors influencing Nepal's imports and exports. Model A reveals that real GDP, remittances, and the consumer price index (CPI) of India significantly impact imports. While GDP and CPI in India have positive effects, remittances show a negative impact on imports. The significant correlation between CPI in Nepal and India initially caused multicollinearity issues, leading to adjustments in

the model. Upon resolving these issues, it was clear that economic growth and external price levels play crucial roles in shaping import patterns. The policy recommendations drawn from Model A emphasize the importance of promoting sustainable economic growth, optimizing remittance usage, and mitigating the impact of rising import costs through strategic trade agreements and domestic production support.

Model B, focusing on exports, highlights the significant influence of the exchange rate and consumer price index of India on export levels. A weaker domestic currency and higher real GDP positively impact exports, while rising consumer prices in India negatively affect them. The analysis underscores the need for Nepal to maintain a favorable exchange rate and explore alternative markets to mitigate adverse effects from external price pressures. Enhancing the competitiveness of Nepalese products through quality improvements and cost reduction measures is also crucial. The policy recommendations from Model B suggest that by addressing these factors, Nepal can improve its export performance and achieve a more resilient economic framework, despite external challenges.

The findings from both models emphasize the critical role of international prices, particularly the CPI in India, in shaping Nepal's trade dynamics. Rising prices in India have a detrimental effect on Nepal's exports while increasing the cost of imports. This highlights the need for Nepal to diversify its trade partners and explore new markets to reduce its reliance on India. Additionally, efforts should be made to enhance the quality and competitiveness of Nepalese products to maintain their appeal in international markets.

Furthermore, the analyses underscore the importance of maintaining a stable exchange rate and promoting sustainable economic growth. A weaker domestic currency can boost export competitiveness, while economic growth enhances the productive capacity and export potential of the country. Policymakers should prioritize measures that support economic stability, such as prudent fiscal and monetary policies, investments in infrastructure, and the creation of a conducive business environment.

The study also emphasizes the need to optimize the use of remittances. While remittances provide a substantial influx of foreign currency, they can also contribute to increased reliance on imports. Policymakers should explore strategies to channel remittances towards productive investments, such as in the agricultural and manufacturing sectors, to enhance domestic production and reduce import dependence.

In conclusion, the findings from this study provide a comprehensive framework for understanding the economic determinants influencing Nepal's international trade. By addressing the key factors identified in the analyses, such as international prices, exchange rates, economic growth, and remittances, Nepal can enhance its trade performance and achieve a more balanced trade structure. The policy recommendations derived from this study can serve as a guide for policymakers in developing strategies to promote sustainable economic development and strengthen Nepal's position in the global trade landscape.

References

Acharya, S. (2013). A panel data analysis of foreign trade determinants of Nepal: Gravity model approach. *NRB Economic Review, 25*(1), 1-20.

Basyal, T. R. (2011). Nepal's economic growth in the context of absorption, trade imbalance and the fixed exchange rate. *Banking Journal, 1*(1), 1-12.

Benoit, K. (2021). *Logarithm Models*. https://kenbenoit.net/assets/courses/ME104/logmodels2.pdf

Francisco A., Antonio C., (2004). Trade and productivity. *The Quarterly Journal of Economics, 19*(2), 613–646. https://doi.org/10.1162/0033553041382139

Ghimire, R. (2010). Direction of foreign trade of Nepal. *Journal of Finance and Management Review, 1*(2), 139-151.

Gondaliya, V., & Dave, P. (2015). The impact of exports and imports on exchange rates in India. *International Journal of Banking, Finance and Digital Marketing, 1*(1), 1-8.

Kafle, S. D. (2006). Effectiveness of trade policy in Nepal. *Economic Journal of Nepal, 29*(1), 13-29.

Mankiw, N.G. (2009). *Macroeconomics.* Worth Publishers.

Mansuri, J. (2021). The impact of trade deficit in Nepalese economy. *Journal of Management, 4*(1), 65-80.

Matuzeviciute, K., & Butkus, M. (2016). Remittances, development level, and long-run economic growth. *Economies, 4*(4), 28.

Ministry of Finance, (2024). *Economic survey* 2023/24. Kathmandu.

Mishra, A. K., & Aithal, P. S. (2021a). Foreign aid movements in Nepal. *International Journal of Management, Technology, and Social Sciences (IJMTS), 6*(1), 142-161. https://doi.org/10.5281/zenodo.4677825

Mishra, A. K., & Aithal, P. S. (2021b). Foreign aid contribution for the development of Nepal. *International Journal of Management, Technology, and Social Sciences (IJMTS), 6*(1), 162-169. https://doi.org/10.5281/zenodo.4708643

Nepal Rastra Bank. *Database on Nepalese Economy* (website). Kathmandu.

Nepal, S. R. (2020). Determinants of trade deficit in Nepal: an econometric investigation. *Nepalese Journal of Statistics, 4*, 73-86.

Pradhan, G., Upadhyay, M., & Upadhyay, K. (2008). Remittances and developing countries. *Development Research, 20*(3), 497-506.

Rivera-Batiz, F. L., Erbil, C., & Opanasets, A. (2020). International Trade Theory and Evidence: A Survey. In *Encyclopedia of International Economics and Global Trade* Volume 3: International Trade and Commercial Policy (pp. 85-144).

Samanta, P., & Yadav, A. (2021). Determinants of Foreign Trade in Nepal. *Anjali, Determinants of Foreign Trade in Nepal (October 21, 2021).*

Saylor Academy. (n.d.). Central Bank Intervention with Fixed Exchange Rates. *In International Economics: Theory and Policy*. https://saylordotorg.github.io/text_international-economics-theory-and-policy/s25-04-central-bank-intervention-with.html

Sharma, S. (2020). Direction and problems of foreign trade in Nepal. *Rupantaran: A Multidisciplinary Journal, 4*(1), 143-152.

Simon Fraser University. (n.d.). *Dealing with multicollinearity in regression analysis*. Retrieved from https://www.sfu.ca.

Thagunna, K. S., & Acharya, S. (2013). Empirical analysis of remittance inflow: The case of Nepal. *International Journal of Economics and Financial Issues, 3*(2), 337-344.

University of Lincoln. (2022). https://online.lincoln.ac.uk/what-is-international-economic-law/

WB. World Bank Annual Report. (2023). *A new era on development*. The World Bank.