

# **Impact of Exchange Rate on Export of Nepal**

**A Thesis**

**Submitted to the Central Department of Economics,**

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**Tribhuvan University Kathmandu, Nepal,**

**In Partial Fulfillment of the Requirements for Degree of**

**Master of Arts**

**In**

**Economics**

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**Feb, 2024**

## DECLARATION

I, BIMAL NEPALI, declare that this thesis paper entitled “**Impact of Exchange Rate on Export of Nepal**” submitted to the Central Department of Economics is my own original work unless otherwise indicated or acknowledged in the thesis. The thesis proposal does not contain materials that have been accepted or submitted for any other degree at the University or other institution. All sources of information have been specifically acknowledged by reference to the author(s) or institution(s).

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## RECOMMENDATION LETTER

Bimal Nepali has authored this thesis is entitled “**Impact of Exchange Rate on Export of Nepal**” under my guidance and supervision. Mr. Bimal has prepared this thesis article for the partial fulfillment of a Master Degree of Arts in Economics (MA Economics). I hereby recommend this commendable work to the thesis committee for further process of scrutiny.

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Prof. Ram Prasad Gyanwaly, Ph.D.  
(Thesis supervisor)  
Feb, 2024

## **LETTER OF APPROVAL**

This is to certify that this is entitled “**Impact of Exchange Rate on Export of Nepal**” submitted by MR. BIMAL NEPALI to the Central Department of Economics, Faculty of Humanities and Social Science, Tribhuvan University, Nepal in partial fulfillment of the requirements for the degree of Master Degree of Arts in Economics (MA Economics) has been found satisfactory in scope and quality. Therefore, here mentioned thesis committee accepts this thesis as a part of the said degree.

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This thesis is designed following the formats and guidelines produced by the Central Department of Economics (CEDECON). I am fully responsible for any discrepancies as well as errors and mistakes found in this thesis paper.

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## **ABSTRACT**

This study tries to investigate the impact of the exchange rate on the export performance of Nepal. The study has implemented the export relation with the top twenty-five exporting countries for the year 1990-2019 AD. The analysis is conducted using both qualitative and quantitative methods. In quantitative analysis, a simple regression method is employed with total export as the dependent variable, Real effective exchange rate as an independent variable, and GDP, population, time trend, and Maoist as control variables.

The finding of the study shows a decrease in the rate of real effective exchange rate is associated with an increase in the rate of export. GDP is positively associated with the level of exports. Maoist armed conflict has a negative impact on the level of exports.

*Keywords: Export, REER, OLS*

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## ABBREVIATIONS

<b>Abbreviation</b>	<b>Full Form</b>
ADF	Augmented Dickey-Fuller
ARDL	Autoregressive Distributed Lag
BOP	Balance of Payments
CBS	Central Bureau of Statistics
CEDECON	Central Department of Economics
COVID-19	Corona Virus Disease 2019
CPN	Communist Party of Nepal
ER	Exchange Rate
EU	European Union
EUR	European Euro
FDI	Foreign Direct Investment
FY	Fiscal Year
GARCH	Generalized Autoregressive Conditional
GDP	Gross Domestic Product
GNS	Gross National Saving Heteroscedasticity
IMF	International Monetary Fund
INR	Indian Rupee
MOF	Ministry of Finance
NEER	Nominal Effective Exchange Rate
NRB	Nepal Rastra Bank
NRP	Nepalese Rupee

NTIS	National Trade Integration Strategy
P	Price Level of Domestic
$P_{fi}$	Price Level of Foreign Country i
PP	Philips Person
REER	Real Effective Exchange Rate
TOT	Term of Trade
$T_{wi}$	Trade Waited of Country i
UAE	United Arab Emirates
USD	United State Dollar
WB	World Bank

# **CHAPTER-I**

## **INTRODUCTION**

### **1.1 Introduction**

An exchange rate refers to the ratio at which one currency can be exchanged for another. It represents the value of one currency in terms of another. Exchange rates typically operate in a free-floating system where they fluctuate based on the forces of supply and demand in the market. However, some exchange rates are fixed or pegged to the value of other currencies, which may involve certain restrictions.

In a fixed exchange rate system, the value of one currency is directly tied to that of another currency. Exchange rates can vary between different countries. Due to the constantly changing nature of exchange rates, they can impact international trade significantly. For instance, Nepal experiences trade deficits as its imports outweigh its exports partly due to fluctuating exchange rates.

When exchange rates are floating, meaning they are not fixed to another currency, the value of money can rise or fall depending on the economic conditions of the countries involved. Exchange rates play a crucial role in any business dealings involving transactions between two different countries.

In 1984, the IMF conducted a study for the General Agreement on Tariffs and Trade (GATT) regarding the influence of exchange rates on global trade. This examination was prompted by escalating protectionist tendencies, substantial fluctuations in major currency exchange rates, and a notable deceleration in worldwide trade.

The significant volatility in exchange rates has been evident since the adoption of generalized floating in 1973. When the exchange rate weakens, the purchasing power of the domestic currency diminishes, leading to increased costs for imports and potentially stimulating demand for domestically produced goods due to their relative affordability. This shift could bolster domestic firms as their exports become more competitive internationally. Consequently, the economy may experience heightened demand for its goods from abroad. Conversely, a depreciation of the exchange rate

results in elevated import costs, leading to higher prices for imported goods such as bananas, automobiles, and oil/gas, thereby burdening consumers with increased expenses. On the other hand, a strengthening currency typically lowers the cost of imports. However, this can also affect employment, as a stronger currency may reduce demand for exports, potentially harming industries reliant on international trade.

Therefore, devaluation aids in enhancing a country's balance of payments (BOP) deficit by boosting exports and curbing imports. It's plausible that, with a rise in the exchange rate, individual firms may tend to enter markets earlier and exist later on average, thereby increasing the overall number of trading entities. The exchange rate can influence trade both directly, through factors like uncertainty and adjustment costs, and indirectly, by shaping the composition of output and investment as well as government policies. A surge in imports and an expanding trade deficit can exert downward pressure on a country's exchange rate. A weaker domestic currency stimulates exports and raises the cost of imports; conversely, a stronger domestic currency hinders exports and lowers the cost of imports.

The impact of the exchange rate is further influenced by the extent of risk exposure. In recent times, the surge in cross-border transactions, facilitated by the liberalization of capital accounts, technological advancements, and currency speculation, has also contributed to exchange rate fluctuations. Given the conflicting theoretical forecasts, empirical studies have investigated the influence of both real and nominal exchange rates on the volume of global trade. A higher exchange rate results in increased costs for risk-averse traders and diminishes foreign trade activity. Moreover, if exchange rate fluctuations become unpredictable, it introduces uncertainty regarding potential profits and diminishes the advantages of engaging in international trade.

An overvalued exchange rate can contribute to a trade deficit, whereas an undervalued exchange rate can encourage a trade surplus. Therefore, countries utilize the exchange rate as a strategic policy tool to enhance their trade balance, particularly, in emerging and developing economies focused on export-driven growth, where undervaluation is maintained to stimulate exports and positively impact the trade balance. Essentially,

devaluation is expected to reduce import demand and increase export demand, leading to a net enhancement in the trade balance, subject to the fulfillment of Marshall Lerner's condition. A trade deficit is closely associated with foreign exchange reserves, as a higher deficit tends to deplete reserves.

Nepal has historically adhered to a pegged exchange rate system with the Indian rupee (INR), implementing periodic adjustments through revaluation and devaluation. Additionally, Nepal has experimented with floating exchange rates independent of India and has employed various exchange rate systems for convertible currencies. In 1933, Nepal introduced current account convertibility, effectively pegging the Nepalese rupee (NPR) to the INR at a rate of NPR 160 for INR 100, a rate which was initially set at 160. Since then, the exchange rate of the NRP with other convertible currencies has been determined by market forces, mirroring the exchange rate of the INR with convertible currencies. Due to the open border and the scale of economic transactions, Nepal's adoption of a pegged exchange regime with the INR offers several advantages and contributes to maintaining price stability.

The current monetary worth of Nepal's goods exported to its top 20 export partners is delineated, with a distinct breakdown for exports to India and the other 19 partners. In the fiscal year 2022/20, India constituted approximately 29.9 percent of Nepal's total merchandise exports. Trade relations with India, as stipulated by the Anglo-Nepal Treaty of 1923, have generally been amicable, barring the period from 1984 to 1990 when India enforced a trade and transit blockade on Nepal. Exports to the remaining 19 markets have experienced a nominal decline since 2000. As of 2023, Nepal's most valuable merchandise export items encompassed iron and steel, knotted carpets, textiles, plastics, hollow tubes, beverages, and vegetable accessories.

A nominal exchange rate represents the standard exchange rate between one country's currency and another country's currency. In the context of two currencies, say x and y, the nominal exchange rate specifies the amount of currency x that can be acquired by exchanging one unit of currency y, and vice versa. This rate can be expressed in two ways, depending on the chosen base currency. If x serves as the base currency, the rate

signifies how many units of x can be obtained by trading one unit of y. Conversely, if y is the base currency, the nominal rate indicates how many units of y are obtainable by exchanging one unit of x.

In contrast, real exchange rates are employed to ascertain the actual purchasing power of a currency. To compute the real exchange rate, we utilize the same nominal exchange rate. This rate signifies the ratio at which the goods and services of one nation can be traded for those of another nation.

A nominal exchange rate is essential for computing the real exchange rate because it enables the conversion of prices of relevant goods and service in both countries into a common currency, facilitating comparison. Understanding the impact of exchange rates on economic growth in Nepal is crucial. One of Nepal's macroeconomic goals is to attain sustainable economic growth. Robust economic growth is instrumental in ensuring sufficient foreign reserves and fostering the development and sustainability of an internationally competitive exporting sector, which in turn fosters job creation and higher incomes.

As of mid-March in FY 2022, the aggregate merchandise exports surged by 82.9 percent, totaling Rs. 147.75 billion. This represents a 7.8 percent rise compared to the corresponding period in FY 2020/21, where exports reached Rs. 80.78 billion. By mid-March of FY 2021/22, exports to India saw a significant spike of 104.2 percent, while exports to other countries increased by 29.1 percent; however, exports to China experienced a decline of 11.0 percent. In contrast, during the same period in FY 2020/21, exports to India rose by 11.3 percent, exports to other countries grew by 2.0 percent, yet exports to China dropped by 43.7 percent.

Notably, exports of palm oil, soybean oil, mustard oil cake, polyester and other yarn, woolen carpets, and various other commodities registered an upsurge, whereas exports of cardamom, tea, herbs, wire, copper wire, and other items dwindled until mid-March of FY 2021/22.



By mid-March of FY 2021/22, the total merchandise imports escalated by 38.6 percent, amounting to Rs.1308.73 billion, compared to a 2.1 percent increase reaching Rs. 943.99 billion in the corresponding period of FY 2020/21. Imports from India saw a rise of 28.1 percent, imports from China surged by 36.7 percent, and imports from other countries soared by 75.4 percent in FY 2021/22. Imports of petroleum products, medicines, crude palm oil, crude soybean oil, gold, and other commodities augmented, whereas imports of MS billets, cement, chemical fertilizers, pulses, molasses sugar, and other goods decreased until mid-March of FY 2021/22.

Overall foreign trade expanded by 42.1 percent, reaching Rs. 1456.48 billion by mid-March of 2021/22. Conversely, in the corresponding period of FY 2020/21, total trade had increased by 2.6 percent, reaching Rs. 1024.77 billion.

In the fiscal year 2079/80, Nepal engaged in foreign trade with over 200 countries, although the majority of its trade activities were concentrated with its two neighboring nations, India and China. India emerged as Nepal's foremost trading partner, holding the position for both imports and exports. Notably, Nepal experienced a notable decrease of 37.5 percent in total trade with India during this fiscal year. This decline encompassed a 17.7 percent reduction in Nepal's total import trade with India and accounted for 62.5 percent of its total exports.

China, on the other hand, stood as Nepal's second-largest trading partner, contributing to a 4.9 percent decline in Nepal's overall trade with third countries in FY 2079/80. Despite being a significant trading partner for imports, representing a 21.7 percent decline in Nepal's total import trade, China did not hold the same position for exports. Nepal's export performance witnessed a decline compared to the preceding year, with only a 9.0 percent export share in this fiscal year.

In contrast to numerous developed nations, Nepal lacks a diverse array of export-competitive goods. In line with the Ricardian theory of international trade, which advocates for countries focusing on producing and exporting goods and services in

which they possess a comparative advantage, this article delves into the ramifications of exchange rate fluctuations on Nepal's export sector.

Nepal, a nation with a significant dependency on imported goods from various global sources, faces challenges in establishing a strong domestic market preference for Nepali products due to perceived quality issues among its citizens. Nonetheless, Nepal sustains a thriving economy primarily bolstered by its export activities.

Nepal's principal export partners include India, the US, Bangladesh, and Germany, with a diverse range of products such as beverages, textiles, tea, plastics, clothing, carpets, handicrafts, leather goods, jute, iron, steel, and hollow tubes. Conversely, Nepal's primary import partners encompass India, China, the UAE, Indonesia, and Thailand, primarily importing fuel, apparel, gold, iron, steel, machinery, and equipment.

In the fiscal year 2023, Nepal's top ten trading countries were India, the United States, Germany, Turkey, the United Kingdom, China, France, Bangladesh, Japan, and Italy. Given Nepal's landlocked status, the majority of its international trade is channeled through India. Nepali cargo typically transits through Indian ports at four key transit points to fulfill international requirements: Birgunj-Raxaul, Biratnagar-Jogbani, Bhairahawa-Sunauli, and Nepalgunj-Rupediya. Both nations have committed to mutual transit rights utilizing agreed-upon routes and procedures under a Transit Treaty.

Nepal's exports to India predominantly include coffee, tea, vegetables, iron and steel, fibers, and various other products. These trading patterns highlight the significance of India as a key trade partner for Nepal.

## **1.2 Statement of the Problem**

Nepal is grappling with a persistent trade deficit issue, marked by a sharp rise in imports contrasted with minimal growth in exports. This imbalance hinders Nepal's ability to fully leverage the benefits of global trade. Presently, Nepal's trade scenario

reveals exports accounting for merely 7.7 percent of GDP, while imports represent a substantial 41.47 percent. Several obstacles hinder trade expansion, including insufficient skilled labor, limited technological advancements, challenging geographical access, constrained domestic markets, and elevated import tariffs.

Over the past four years, Nepal has experienced a consistent uptrend in its total foreign trade activity concerning goods. However, a reversal occurred in FY 2079/80, marked by a notable decline. During this fiscal year, Nepal's overall merchandise trade contracted by 20.1 percent, with export receipts witnessing a slight decrease of 29.1 percent. Over the past four years, Nepal has experienced a consistent uptrend in its total foreign trade activity concerning goods. However, a reversal occurred in FY 2079/80, marked by a notable decline. During this fiscal year, Nepal's overall merchandise trade contracted by 20.1%, with export receipts witnessing a slight decrease of 29.1%. Notably, the enhancement in export value was primarily driven by the introduction of new export commodities into Nepal's trade repertoire, specifically refined palm oil and soybean oil. Concurrently, imports decreased by 19.1% during this period. While a downward trajectory in import trade was evident in the initial eight months of FY 2079/80, the overarching decline was also influenced by the onset of the COVID-19 pandemic, which impacted Nepal starting in March 2020. Nepal's trade connections extend to over 100 nations, with 19 items earmarked for export under its National Trade Integration Strategy (NTIS) as of 2021.

### **1.3 Research Questions**

The research aims to examine how fluctuations in the exchange rate affect Nepal's export performance. Emphasis will be placed on assessing the export performance within the context of the research question.

1. How does the exchange rate impact on the export performance of Nepal?
2. How has the export performance of Nepal with top twenty-five trading partners been affected by exchange rate?

## **1.4 Objectives**

The objective of the study is to determine the impact of exchange rate on export performance with top twenty-five trading partners. Following are the specific objectives.

- I. To explore the exchange rate impact on the export performance of Nepal.
- II. To analyze the export performance of Nepal with top twenty-five trading partners affected by exchange rate.

## **1.5 Significance of the Study**

This research holds potential utility for researchers, students, and individuals seeking to delve deeper into the subject matter. Moreover, it offers a valuable resource for government officials, planners, policymakers, social workers, and various stakeholders. By providing additional insights, this study serves as a supplementary information source to elucidate the effects of exchange rate fluctuations on Nepal's export dynamics. The findings and conclusions derived from this research can inform policymaking at a strategic level, aiding in the formulation of appropriate plans and programs geared towards achieving predefined objectives within specified timeframes.

## **1.6 Scope and Limitations of the Study**

The study's scope is constrained by the unavailability and challenges associated with acquiring all necessary data. It specifically focuses on Nepal's export impact in its top twenty-five trading partner countries concerning exchange rate dynamics. Due to various factors such as time constraints, resource limitations, and the requirement for thesis completion, the study period spans from FY 1990 to 2019.

Consequently, the reliability of the study hinges on the dependability of secondary data sources, particularly in demonstrating the exchange rate's influence on exports with Nepal's top twenty-five trading partners.

## **1.7 Organizations of the Study**

The research is structured into five chapters, each addressing different aspects of the research topic. Chapter one serves as the introduction, providing background information, stating the problem, outlining research questions, and objectives, discussing the significance of the study, and delineating the scope and limitations. Chapter two delves into the existing literature concerning the impact of exchange rates on foreign trade, encompassing theoretical, empirical, and methodological reviews from both national and international perspectives.

Similarly, chapter three outlines the detailed methodology employed in the research, including research design, conceptual framework, data sources, and analysis techniques. Chapter four focuses on presenting and interpreting the results and trends, as well as the application of models.

Finally, the last chapter, conclusion and policy implication, findings, conclusion, and recommendations, encapsulates the entire research in concise paragraphs. It either reveals the findings or provides recommendations for further research in the same field. Additionally, this chapter suggests avenues for future research contributions.

## **CHAPTER-II**

### **REVIEW OF LITERATURE**

#### **2.1 Introduction**

In the fields of economics and public policy, there is an ongoing discourse regarding the nature and direction of the relationship between exchange rates and exports. This chapter presents a literature review encompassing both positive and negative associations between them. Additionally, it discusses various methodologies employed in the literature.

The exchange rate holds a significant position within the economy, exerting influence over a myriad of transactions more than any other singular price. Altering the exchange rate, particularly in instances necessitating substantial sums, involves redistributing wealth among influential segments of the population. Such adjustments not only elevate the relative costs of imports but also necessitate government interventions to curb wage and income increases in order to prevent a commensurate rise in domestic prices following currency devaluation. Groups such as urban workers, middle-class professionals, civil servants, and the affluent, whose consumption heavily relies on imports, typically exhibit resistance to devaluation. Consequently, governments have often hesitated to devalue their currency, and when they have opted to do so, they have frequently implemented insufficient devaluations in response to escalating inflationary pressures.

#### **2.2 Theoretical Foundation**

The connection between exchange rates and exports and imports has been somewhat unclear, with some studies suggesting that devaluation benefits exports and that maintaining stable exchange rates yields advantages, while others argue that devaluation is just one of many factors influencing exports. To further explore this topic, it is essential to clarify the theoretical foundations of exports and exchange rates. Export is commonly accounted for in the Balance of Payments (Bop) by

crediting exports. Bop serves as a financial accounting ledger that merges the current account and capital account. Since exports fall within the current account category, this study primarily focuses on the current account.

This study adopts the Bop methodology to analyze exports and imports due to the absence of groundbreaking articles or pioneering theories illustrating the relationship between exchange rates and exports and imports. Three highly respected theoretical works in this field serve as the basis for this investigation.

### **2.2.1 Absorption approach to balance of payment**

To enhance its trade balance, a country needs to expand its production of goods and services. The Keynesian economic framework, particularly the approach to national income and output, can be employed to elaborate on this concept.

$$Y = C+I+G+(X-M) \dots\dots\dots (i)$$

Where, Y = National output

C = Consumption

I = Investment

G = Government expenditures

X and M are, respectively, exports and imports.

In accordance with the absorption approach, the effectiveness of devaluation relies on the simultaneous increase in both domestic output (Y) and absorption (C+I+G) across the entire economy. This strategy focuses on boosting national output and expenditure. Furthermore, equation (i) can be formulated as follows,

$$X-M = Y-(C+I+G) \dots\dots\dots (ii)$$

This correlation indicates that if national income rises at a rate exceeding that of absorption, the trade balance (X-M) will see an improvement.

Vines (2008) built upon Alexander's (1952, 1959) absorption method, refining it to consider how changes in price elasticity can influence consumer spending, directing it

towards domestic goods, thereby enhancing the trade balance (X-M). Now, let's investigate the well-known Keynesian trade multiplier.

$$k = \frac{1}{[1 - c(1 - t) + m]}$$

where, k = Keynesian trade multiplier

c = Marginal propensity of consumption i.e.  $\Delta C / \Delta Y$

t = Government tax rate

m = Marginal propensity to import i.e.  $\Delta M / \Delta Y$

Let x denote the effects of a one-unit currency devaluation on expenditure switching in the trade balance, while y represents the overall impact of this devaluation on the trade balance.

Then,

Devaluation results in an increase in output (kx) and an increase in absorption

(c(1-t) kx).

Then,

$$y = k[1-c(1-t)]x \dots\dots\dots (iii)$$

The preceding relationship indicates that devaluation leads to an improvement in the trade balance if c is less than one and t is positive and less than one. Consequently, absorption will increase by a smaller proportion compared to production. This outcome demonstrates the integration of the Keynesian multiplier and elasticity approach to influence output and absorption following devaluation. The trade balance improves because the multiplier (k times m) is less than one, resulting in the increase in imports caused by the multiplier (mkx) being smaller than the favorable expenditure switching impact (x), thus enhancing the trade balance.

$$\begin{aligned} z &= k - [1 + (1 - t)ck] \\ &= k - [1 - c(1 - t) + m + c(1 - t)]k \end{aligned}$$



$$= -mk \dots \dots \dots (iv)$$

Suppose a one-unit increase in government spending leads to a rise in production by  $k$ , while absorption increases by the combined effect of the spending increase and the resulting consumption rise, expressed as  $(1-t)ck$ , resulting in a deterioration of trade by  $z$  units.

Let  $w$  represent the anticipated improvement in the trade balance, units denote the currency depreciation and the required adjustment to government spending be denoted as. Equations (iii) and (iv) yield:

$$w = [1 - c(1 - t)]kx\alpha - mk\beta \dots \dots \dots (v)$$

As the economy is operating at full employment with no additional output feasible, enhancing the trade balance necessitates reducing absorption. Consequently, the outcome remains unaltered.

$$0 = kx\alpha - k\beta \dots \dots \dots (vi)$$

Commencing with equation (vi) as a foundation, solving for, substituting, and incorporating the value of the multiplier into equation (v),

$$w = \left[ \frac{1}{k} - m \right] kx\alpha + mkx\alpha$$

$$= x\alpha$$

Hence, the required devaluation equals  $w/x$ .

Upon substituting this relation into equation (vi), the essential adjustment in government spending equals  $-w$ . This condition can be expressed as:

- i. Government expenditure must be reduced adequately to release resources for domestic utilization.
- ii. Devaluation must ensure that these resources are effectively utilized to improve the trade balance rather than causing a decline in domestic output.

### 2.2.2 Elasticity approach/Marshall Lerner condition

The elasticity approach, also known as Marshall-Lerner condition, outlines that a currency devaluation will improve the balance of payments only if the combined elasticity of demand for imports and exports exceeds one. Let's express this concept mathematically. The balance of payments (BoP) in domestic currency is expressed as:

$$N_x = X - eM \dots \dots \dots (i)$$

Where,

$X$  = Export

$e$  = Exchange rate in exponential form

$M$  = Import

Taking the derivative of equation (i) with respect to 'e' on both sides,

$$\frac{\partial N_x}{\partial e} = \frac{\partial x}{\partial e} - e \frac{\partial M}{\partial e} - M$$

Multiplying both sides by  $\frac{e}{x}$

$$\frac{e}{x} \frac{\partial N_x}{\partial e} = \frac{e}{x} \frac{\partial x}{\partial e} - e \frac{e}{x} \frac{\partial M}{\partial e} - \frac{e}{x} M$$

If BOP is in equilibrium, then  $N_x = 0$

That implies,  $X = eM$

$$\frac{e}{x} \frac{\partial N_x}{\partial e} = \frac{e}{x} \frac{\partial x}{\partial e} - e \frac{e}{eM} \frac{\partial M}{\partial e} - \frac{e}{eM} M$$

$$\frac{e}{x} \frac{\partial N_x}{\partial e} = \frac{e}{x} \frac{\partial x}{\partial e} - \frac{e}{M} \frac{\partial M}{\partial e} - 1$$

$$\frac{e}{x} \frac{\partial N_x}{\partial e} = \eta_x + \eta_{m-1} \dots \dots \dots (ii)$$

This is referred to as the Marshall-Lerner condition.

Where,

$$\eta_x = \frac{e}{x} \frac{\partial x}{\partial e} = \text{Export Elasticity}$$

$$\eta_m = \frac{e}{M} \frac{\partial M}{\partial e} = \text{Import Elasticity}$$

From equation (ii), if

$\eta_x + \eta_m < 1$ , BoP deficit (BoP improves by revaluation)

$\eta_x + \eta_m > 1$ , BoP surplus (BoP improves by devaluation)

$\eta_x + \eta_m = 1$ , BoP balanced (BoP has no effect of fluctuation of the exchange rate)

In summary, if a country devalues its currency but predominantly exports low-value goods, these goods will become cheaper in foreign currency. Consequently, the impact of devaluation on enhancing the Balance of Payments (BoP) may be mitigated, as the increase in exports resulting from devaluation might not be substantial. Similarly, if a country devalues its currency and imports decrease, but the import demand elasticity is low relative to the devaluation, there might be reduced demand for goods as prices rise. In such cases, the policy may be ineffective in improving the BoP position.

There is no consensus among these three approaches to the balance of payments, as they each advocate for the BoP's effect with differing perspectives. The absorption method, which is purely Keynesian, suggests reducing domestic absorption relative to national output volume to improve the BoP position. On the other hand, the elasticity approach posits that currency depreciation benefits the BoP position only if the combined elasticity of demand for imports and exports is less than one. While these

three approaches are theoretically incompatible, they collectively aim to enhance the BoP as much as possible by leveraging their diverse theoretical frameworks.

## **2.3 Empirical Review**

In the realms of economics and global trade, the correlation between exchange rates and exports and imports has garnered significant attention. Extensive empirical research has been conducted both domestically and internationally on this subject. Some scholars argue that since the price of a product heavily influences its demand, exchange rate fluctuations have a detrimental impact on exports and imports. Conversely, another school of thought suggests that with the availability of numerous exchange rate hedging products in today's environment, the role of currency fluctuations has become less significant.

In light of these diverse viewpoints and perspectives, the literature encompasses a wide range of analyses and interpretations.

### **2.3.1 National Context**

Thapa (2002) conducted a study using annual time series data from 1978/1979 to 1999/2000 to explore the relationship between the Real Effective Exchange Rate (REER) and GDP in the Nepalese economy. The study proposed that the real exchange rate impacts economic activity through both the Aggregate Demand (AD) and Aggregate Supply (AS) channels. According to the AD channel, a depreciation of the real exchange rate enhances the international competitiveness of local products, leading to increased exports and real GDP domestically. Conversely, the AS channel suggests that a depreciation of the real exchange rate elevates production costs, shifting income distribution towards the wealthy class, thereby reducing AD and real GDP. The empirical investigation revealed the active presence of the AD channel in Nepal. Marshall Lerner's condition of currency depreciation indicated import and export elasticities greater than unity, implying that real exchange rate appreciation negatively affects both AD and real GDP. The report proposed two policy recommendations: firstly, Nepal should maintain a stable real exchange rate and

utilize it as a significant macroeconomic variable; secondly, it emphasized that the M1 money supply remains more crucial to monetary policy than the M2.

Sapkota (2013) underscored the significance of remittance inflows and their implications on various sectors, including the exchange rate and external competitiveness, utilizing Real Effective Exchange Rate (REER) and remittances variables in the study titled "Remittances in Nepal: Boon or Bane?" The analysis was based on annual data spanning from 1974/75 to 2010/11. The study highlighted the positive impacts of remittance inflows, such as strengthening the economy and contributing to a reduction in poverty inequality, an increase in foreign currency reserves, a rise in gross national savings, and an expansion of the Balance of Payments (BoP) surplus. Consumption tax constituted 50% of the total tax revenue collection. Conversely, the study also brought attention to the negative consequences of excessive remittances, leading to the phenomenon known as Dutch Disease, which has adversely affected Nepal by causing a decline in the manufacturing and export sectors. According to the findings, Nepal faces the challenge of managing remittance inflows effectively. The study suggests allowing remittances to flow in, issuing diaspora bonds to utilize in sustainable growth initiatives, and implementing measures to mitigate the potential adverse effects of excessive remittance inflows.

Poudel & Burke (2015) conducted a study on exchange rate policy and export performance in the context of Nepal, focusing on the 20 largest export destinations from 1980 to 2010. Their analysis revealed the prolonged currency peg against the Indian Rupee and a significant appreciation of the real exchange rate starting from the late 1990s. Utilizing the Augmented Gravity Model (Hasson & Tinbergen, 1964), they examined the impact of real exchange rate appreciation on Nepal's exports. Their model included exports as the dependent variable and several explanatory variables such as the GDP of trading partners, population of two trading partners, bilateral real exchange rate index with a partner, FDI inflow in Nepal, Nepal's import tariffs, and dummies for events like the Indian Blockade, regional trade agreements, and the Maoist insurgency. The empirical findings indicated that real exchange rate appreciation had a substantial negative effect on Nepal's exports. Therefore, the study

suggested that Nepal may benefit from reevaluating its currency peg, either through adjustments to the peg rate or by transitioning to a more flexible exchange rate system to avoid falling into the export competitiveness trap. Additionally, the study recommended promoting the export of high-value low-weight products through airlift as a strategy for export promotion.

Chaulagai (2015) analyzed the impact of devaluation and tested the J-curve Hypothesis in the case of Nepal, employing annual time series data spanning from 1975 to 2013. The study utilized Vector Autoregressive (VAR) and Autoregressive Distributed Lag (ARDL) models to examine the relationship. The findings indicated that there was no evidence of a J-curve effect in Nepalese trade; instead, it operated as an L-curve. This suggests that devaluation of the nominal exchange rate does not provide a viable avenue for improving Nepal's trade imbalance.

Panta & Budha (2016) focused on examining the interconnections between remittances and exchange rates, drawing insights from Nepal based on monthly data spanning from 2006 to 2015. Utilizing Ordinary Least Squares (OLS), Engle-Granger cointegration test, and the FM-OLS model alongside macroeconomic variables, they investigated the relationship. The study revealed that the depreciation of the Nepalese currency has a positive impact on remittance inflow. Additionally, it found that the economic activity in India significantly influences remittance inflow into Nepal. Moreover, the cyclical component of remittance inflow is positively influenced by the nominal exchange rate and economic activity in India, Gulf nations, and advanced economies. Consequently, it may be more feasible for the monetary authority to anticipate higher remittance growth when there is a depreciation of the nominal exchange rate of the Nepalese currency against the USD. Additionally, managing money market operations to absorb liquidity stemming from surges in remittance inflow could be beneficial.

Koirala (2018) examined the influence of the real effective exchange rate (REER) on the economic growth of Nepal, utilizing annual time series data covering the period from 1975 to 2015. The impact of REER on Nepal's real GDP was assessed using the Engle-Granger residual-based test and an error correction model, with explanatory

variables including the real effective exchange rate, broad money supply, trade openness, and gross fixed capital formation. The findings of the study revealed a positive impact of the real effective exchange rate on Nepal's real GDP. Consequently, the study concludes that the transmission mechanism of REER through aggregate demand holds true in the case of Nepal, and this outcome aligns with the conventional approach to exchange rate dynamics.

Adhikari (2018) investigated the effects of the exchange rate on the trade deficit and foreign exchange reserve in Nepal, analyzing data from 1974/75 to 2014/15. The impact of the exchange rate on these variables was assessed using the Ordinary Least Squares (OLS) method, with key variables identified. The study revealed that a one percentage point depreciation of the Nepalese rupee (NRP) relative to the US dollar resulted in an increase in reserves by 0.85 percentage points and a decrease in the trade deficit by 6.75 percentage points. Recognizing the volatility and fragility of Nepal's external sector, the study suggests that the government and central bank could utilize exchange rate policy to some extent to address the trade deficit and maintain sufficient foreign exchange reserves, thereby strengthening the external sector.

Devkota & Panta (2019) examined the presence of a cointegrating relationship between exports, imports, and the USD exchange rate in Nepal, utilizing yearly time series data spanning from 1965 to 2017. The relationship was assessed using the Augmented Dickey-Fuller unit root test and Johansen's multivariate cointegration test. The results indicated the absence of a cointegrating relationship between exports, imports, and the USD exchange rate in Nepal, thereby precluding the estimation of a causal relationship within the Vector Error Correction Model (VECM). The lack of cointegration suggests that macroeconomic policies in Nepal have been ineffective in achieving long-run equilibrium between exports and imports, thus indicating a violation of Nepal's international budget constraint. These findings hold significant implications for decision-making by national policymakers.

Dumre (2019) explored the influence of the exchange rate, imports, and exports on the economic development of Nepal, analyzing time series data from 1974/75 to 2016/17. The study employed the Ordinary Least Squares (OLS) method to examine the impact

of these variables on economic development and discovered a statistically significant relationship between all independent variables and dependent variables.

Pun (2020) analyzed the prospective influence of the exchange rate on exports within the Nepalese context, employing annual time series data spanning from 1974 to 2011. This study empirically investigated the impact of the real exchange rate on exports in Nepal using the Autoregressive Distributed Lag (ARDL) approach. As part of assessing the unit root properties of the time series data, the variables underwent diagnosis through the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests, revealing a significant positive relationship between the exchange rate and exports in Nepal.

Reshmi (2021) aimed to assess the influence of the exchange rate on the economic growth of Nepal, utilizing annual time series data from 1973 to 2018. This study examined the impact of the exchange rate on Nepal's economic growth using a linear regression model, revealing a positive and significant relationship between the exchange rate and GDP.

Gautam (2021) delved into examining the correlation between the real effective exchange rate and trade balance in Nepal, utilizing annual data from 1979 to 2019. The relationship between the real effective exchange rate and trade balance was evaluated through the Engle-Granger cointegration test and Error Correction Model, employing cointegrated variables. The analysis revealed that the real effective exchange rate and real GDP significantly contribute to an increase in the trade deficit in the long run, while remittances exerted a negative impact. Furthermore, the error correction model indicated that in the short run, the real effective exchange rate and real GDP have a positive effect, whereas remittances exhibit a negative and significant impact on the trade deficit.

Khadka (2021) conducted an investigation into the impact of the real exchange rate and its volatility on the real exports of Nepal, utilizing quarterly data from 2004Q3 to 2020Q1. The study employed Ordinary Least Squares (OLS) estimation to analyze these relationships. The findings suggest that there is no statistically significant effect



of the real exchange rate on Nepal's exports. However, exchange rate volatility was found to have a statistically significant and inverse effect on real exports. Moreover, an anticipation of appreciation in the real exchange rate leads to an increase in real exports in the same direction. Interestingly, the study revealed an inverse relationship between remittance inflow and the real exchange rate, indicating that there is no evidence of remittance-induced appreciation of the Nepali rupee. Nepal has experienced a single-digit appreciation of the Real Effective Exchange Rate (REER) since the base year 2010. Therefore, the study suggests that Nepal should focus on promoting the export of comparative advantage goods, particularly high-value low-weight products, instead of investing time and resources in currency devaluation for export purposes. Additionally, there is a pressing need for forward-looking policies and the establishment of a forex hedging market. Given the absence of currency appreciation induced by remittance inflows, there is no immediate need to restrict migrant workers. Instead, policymakers should strive to create an environment conducive to fostering saving and investment habits among remittance receivers.

Joshi et al. (2023) analyzed the influence of the exchange rate on exports in Nepal from 1975 to 2020. The study utilized the ARDL bounds test to investigate this relationship and found evidence of long-run co-integration. Additionally, the study supported the existence of a short-run dynamic relationship between the dependent and independent variables, revealing both long-run and short-run impacts of the exchange rate on Nepal's exports. Consequently, the study suggests that policymakers should prioritize strategies aimed at boosting exports and reducing imports.

### **2.3.2 International Context**

Chowdhury (1993) investigated the influence of exchange rate volatility on trade flows within the G-7 nations from 1973 to 1990. Exchange rate volatility is assessed through multivariate error-correction techniques, revealing a consistently adverse effect on export volumes across all G-7 countries.

Bahmani-Oskooee & Payesteh (1993) analyzed how the trade flows of six developing countries respond to exchange rate volatility during the period from 1973 to 1990.

They employ standard econometric methods to measure exchange rate volatility and find evidence suggesting negative impacts of exchange rate uncertainty on trade volume. However, when employing cointegration techniques, they refute the idea of any long-term relationship between imports, exports, and their determinants.

Saang Joon (2004) examined how exchange rate volatility affects exports across 14 Asia-Pacific nations from 1980 to 2002. Using simple Ordinary Least Squares (OLS) models, fixed effects models, and random effects models, the study identifies a noteworthy adverse effect of exchange rate volatility on export volume, as well as on the Gross Domestic Product (GDP) of the importing country and the depreciation of the exporting country's currency.

Fountas & Aristotelous (2005) examined the influence of exchange rate regimes on exports over quarterly periods from 1973 to 1996. Employing econometric methods such as multivariate cointegration and error-correction models, the study frequently finds that the short-term effect of exchange rate volatility on intra-EU export volume is not statistically significant.

Yarmukhamedov (2007) explored the trade impact of exchange rate fluctuations in Sweden during the period from January 1993 to December 2006. Employing the EGARCH model, the study delves into the trade effects of exchange rate fluctuations and identifies a negative association between short-term volatility dynamics and both exports and imports.

Chit et al. (2008) investigated the relationship between exchange rate volatility and exports utilizing panel data spanning from the first quarter of 1982 to the fourth quarter of 2006. Employing the gravity model, the study reveals a negative effect of exchange rate volatility on the exports of emerging East Asian nations.

Berdiev et al. (2011) investigated the factors influencing the selection of exchange rate regimes, including government ideology, political institutions, and globalization trends. Their analysis covers annual data spanning from 1974 to 2004 across a panel of 180 countries, comprising 26 developed and 154 developing nations. Exchange rate regimes are assessed using a panel multinomial logit approach, incorporating various

explanatory variables. The study reveals that left-wing governments, democratic institutions, central bank independence, and financial development increase the likelihood of adopting a flexible exchange rate regime. Conversely, more globalized countries tend to prefer a fixed exchange rate regime. Furthermore, the research highlights that political economy factors exert distinct effects on the choice of exchange rate regimes in developed and developing countries.

Sabri et al. (2012) explored the effects of exchange rate volatility on trade between the Southern and Northern regions, utilizing monthly time series data spanning from 2000 to 2011. Exchange rate volatility is assessed through a Vector Autoregressive Regression model with exogenous variables. The study reveals that exports of goods from Egypt to the EU declined by approximately 3% compared to the baseline, attributed to their increased costliness, while imports from the EU became more affordable.

Eichengreen & Gupta (2012) investigated the relationship between the real exchange rate and export growth using panel data spanning from 1980 to 2009. Real exchange rate and export growth are assessed through regression analysis, accounting for heteroskedasticity and autocorrelation among dependent and independent variables. The study underscores the significance of the real exchange rate for export expansion, particularly highlighting its amplified impact on the export of services compared to goods. This effect is particularly pronounced for the export of modern services. The findings suggest that as developing countries transition from primarily exporting commodities and merchandise to including traditional and modern services in their export mix during the course of development, appropriate policies targeting the real exchange rate become increasingly crucial.

Nicita (2013) investigated the interplay between exchange rates, international trade, and trade policy during the period from 2000 to 2009. Employing the standard gravity model, the study reveals that trade diversion attributable to currency misalignments amounts to approximately one percent of world trade. The findings yield three primary policy implications. Firstly, policymakers should closely monitor both their own country's exchange rates and those of other nations, given the significant impact of

currency misalignments on international trade. Secondly, while the relative valuation of currencies plays a role in global trade imbalances, its influence is relatively small. Lastly, strategies aimed at preventing the resurgence of protectionist measures should involve multilateral cooperation focused on stabilizing exchange rates towards their equilibrium levels.

Nyeadi et al. (2014) examined the influence of exchange rate fluctuations on exports during the period from 1990 to 2012. Employing an Ordinary Least Squares (OLS) model, the study concludes that exchange rate movements do not have a significant impact on the export of goods and services in Ghana. Instead, factors such as GDP, GNS (Gross National Savings), import growth, and total investment demonstrate significant effects on exports.

Gene & Artar (2014) explored the impact of exchange rates on exports and imports of emerging countries, utilizing annual data spanning from 1985 to 2012. Employing the Panel Cointegration method, the study reveals a cointegrated relationship between the effective exchange rate and the export-import dynamics of emerging nations in the long run.

Lotfalipour & Bazargan (2014) aimed to assess the impact of real effective exchange rate volatility on Iran's trade balance from 1993 to 2011. Exchange rate volatility is measured using unit root tests and the GARCH approach, while a balanced panel data model is utilized. The findings suggest that the real exchange rate does not have a significant effect on the trade balance. Instead, the trade balance is predominantly influenced by imports rather than exports.

Shaikh & Hongbing (2015) investigated the influence of exchange rate fluctuations on trade flows in China, Pakistan, and India, utilizing time series data spanning from 1980 to 2013. Exchange rate volatility is assessed using the standard deviation of the moving average of the logarithm of the exchange rate as a proxy for volatility, and the Autoregressive Distributed Lag approach for co-integration. The study finds that in the short run, exchange rate volatility is negatively correlated with Chinese exports but positively correlated in the long run. Conversely, for Pakistan and India, both in the

short run and long run, exchange rate volatility is negatively associated with the total volume of trade.

Imoughele & Ismaila (2015) investigated the influence of exchange rates on non-oil exports using time series data obtained from the Central Bank of Nigeria covering a period of 27 years from 1986 to 2013. The study employs the Augmented Dickey-Fuller (ADF) test for unit root analysis and Johansen's co-integration test to establish both short and long-run relationships between non-oil exports and independent variables. Three co-integrating equations are identified, indicating the existence of a long-run relationship among the variables. Ordinary Least Square (OLS) statistical technique is utilized to assess the determinants of non-oil exports in Nigeria. The findings reveal that the effective exchange rate, money supply, credit to the private sector, and economic performance significantly impact the growth of non-oil exports in the Nigerian economy. Additionally, the appreciation of the exchange rate is found to have a negative effect on non-oil exports, consistent with economic theory. Consequently, the study recommends, among other measures, that monetary authorities should prioritize exchange rate stability to mitigate inflationary pressures in Nigeria, which adversely affect the growth of non-oil exports.

Ahmed (2017) investigated the influence of exchange rates on exports in Pakistan, utilizing annual time series data spanning from 1970 to 2015. The study utilizes secondary data obtained from the International Monetary Fund (IMF) and World Bank (WDI). The impact of exchange rates on exports is assessed using Augmented Dickey-Fuller (ADF) and Phillip-Perron (PP) tests to examine data stationarity, while the Auto Regressive Distributed Lag (ARDL) method is employed to analyze the relationship between the variables under consideration. The findings indicate that the exchange rate has a negative but statistically insignificant impact on Pakistan's exports, while the world's income demonstrates a positive and significant effect on exports.

Palazzo & Rapetti (2017) examined the relationship between the real exchange rate and export performance in Argentina during the period of 2002-2008. Their study manipulated simple equations to investigate how exports and economic growth fared, even in instances of a higher Real Exchange Rate (RER) since the mid-1980s in

Argentina. Their findings suggested that export promotion could be supported by the RER for economic growth, utilizing both macroeconomic and microeconomic channels.

Miranda & Mordecki (2017) conducted a study on real exchange rate volatility and exports using time series data from 1990 to 2013. They investigated the relationship between real exchange rate volatility and exports employing Johansen's methodology and analyzed the impulse response function. Their findings indicated that exports depended positively on global demand and international prices. However, they found that conditional Real Exchange Rate (RER) volatility did not have a significant impact on exports for the selected group of countries, except for Uruguay, where RER volatility negatively affected exports in both the short and long terms.

Oluyemi & Essi (2017) investigated the impact of exchange rates on imports and exports in Nigeria using monthly data spanning from 1996 to 2015. They employed the Augmented Dickey Fuller (ADF) test model to analyze the effects. The VAR (Vector Autoregression) lag order selection revealed that a lag order of 2 was adequate for the model. The study found that exchange rates had a positive but insignificant effect on imports, while they had a negative but insignificant effect on exports at lag 1, but a positive and insignificant effect at lag 2. Additionally, exports were observed to negatively affect exchange rates, while imports positively influenced exchange rates. Overall, the results suggested that exchange rates in Nigeria were not significantly impacted by the activities of imports and exports, nor did they significantly affect the volume of imports and exports. The impulse response function indicated that exchange rates responded positively to imports and negatively to exports.

Bahmani et al. (2017) examined the influence of real exchange rate volatility on trade flows using quarterly data from 1971Q1 to 2015Q4. Their study investigated the relationship between exchange rate volatility and international trade performance utilizing the bounds-test approach. They found that while exchange rate volatility affected trade flows in the short run for many countries in their sample, the long-run effects were only observed on the exports of five countries and the imports of one country.

Hunegnaw (2017) conducted research on the effect of the real exchange rate on manufacturing exports in 10 East African countries using time series data from 1995 to 2013. Employing the ARDL (Auto Regressive Distributed Lag) method, the study found that an increase in real GDP positively impacted manufacturing exports, and a rise in foreign real GDP also improved manufacturing exports. The paper suggests one policy recommendation to enhance exports in these countries: fostering a conducive environment for economic growth without excessive reliance on the devaluation of the domestic currency.

Ngondo & Khobai (2018) conducted an assessment of the impact of the exchange rate on exports in South Africa spanning the period from 1994 to 2016. The study aimed to determine whether a statistically significant relationship exists between exports and the exchange rate, while also considering real interest rates, investments, and inflation as control variables. Utilizing the Autoregressive Distributed Lag (ARDL) approach, the study empirically examined the impact of the real exchange rate on exports in South Africa. Unit root tests, including the Augmented Dickey-Fuller (ADF) and Philips Perron (PP) tests, were employed to analyze the time series data. The findings indicated a significant negative relationship between the exchange rate and exports in South Africa.

Bostan et al. (2018) focused on examining the effect of exchange rates on international commercial trade competitiveness during the period from 2007 to 2014. Their study investigated the impact of exchange rates on international commercial trade competitiveness using the OLS (Ordinary Least Squares) method. The findings revealed that national currency depreciation reduced the competitiveness of foreign products, leading to a negative influence on imports. However, exports were not affected by national currency depreciation in terms of competitiveness.

Hien et al. (2019) conducted an investigation into whether Asian developing countries have been experiencing Dutch disease. They utilized the method of moments (S-GMM) for linear dynamic panel data (DPD) from 32 countries over the period from 2006 to 2016. The remittance, real exchange rate, and Dutch disease were measured

using baseline regression by the OLS method with variables. The study found that as remittance per capita increased by 1%, the real effective exchange rate (REER) of these countries appreciated by 0.103%, thereby undermining the countries competitiveness, thus supporting the existence of Dutch disease for countries with a higher remittance ratio. Additionally, it was observed that as types of exchange rate regimes of countries were considered, the findings supported the idea proposed by Combes et al. (2011), wherein a floating exchange rate resulted in the dampening appreciation of the real exchange rate caused by capital flows. Furthermore, it was noted that Dutch disease appeared only in countries with low levels of exports due to remittance inflow.

Youssef & Zaki (2019) analyzed the export performance and exchange rate patterns of Egypt in a Policy Research Working Paper of the World Bank Group covering the period from 1995 to 2016. The study investigated these patterns using the gravity model and found that exchange rate depreciation alone is not adequate to improve and increase the country's exports, as price competitiveness represents only one aspect of a nation's ability to enhance its external competitiveness. The authors concluded by recommending measures to enhance external competitiveness, including fostering and diversifying domestic production and removing non-tariff barriers to trade such as administrative, technical, and sanitary trade barriers.

Subanti et al. (2019) conducted a study on the impact of exchange rate volatility on exports using panel data from five ASEAN countries spanning the period from 2000 to 2016. The research investigated the relationship between exchange rate volatility and exports using pooled least squares, fixed effect, and random effect methods. The findings indicated that exchange rate volatility had a negative impact on exports.

Gallo et al. (2020) analyzed the effects of exchange rate uncertainty on exports utilizing panel data from January 1994 to December 2014. The study employed an autoregressive model to examine the impact of exchange rate uncertainty on exports. The results revealed a negative impact on manufacturing-exporting countries, while commodity-exporting countries were not significantly affected.



Putri et al. (2020) sought to ascertain the impact of exchange rates and freight costs on the export volume of ADIDAS over the period from January 2014 to December 2019. Employing an explanatory research method, the study investigated how exchange rates and freight costs collectively influence the export volume of ADIDAS. Their findings revealed that both exchange rates and freight costs, when considered simultaneously, accounted for 44.5% of the variation in export volume. Specifically, the exchange rate was found to have a negative and significant effect on the export volume of ADIDAS.

Khachatryan & Grigoryan (2020) conducted an empirical examination of the relationship between the real exchange rate and exports of Armenia, utilizing quarterly data from January 2001 to June 2019. Their study employed a regression model to investigate the dynamics between the real exchange rate and exports in Armenia. The findings revealed a weakening link between exchange rates and exports, particularly in the context of a developing country like Armenia. Additionally, the study determined that exchange rate volatility did not have a statistically significant effect on exports. Furthermore, the researchers identified evidence of Dutch Disease induced by the inflow of remittances in Armenia.

Morina et. al (2020), examined the effect of real effective exchange rate volatility on economic growth in the central and Eastern European countries using annual data for fourteen CEE countries for the period 2002 to 2018. Exchange rate volatility is measured by using standard deviation and z-score model found that using the fixed effect estimation for panel data reveal that the volatility of the exchange rate has a significant negative effect on real economic growth.

Sugiharti et. all (2020), examined the impact of exchange rate volatility on Indonesia's top exports to the five main export markets, namely China, India, Japan, South Korea, and the United States using monthly data covering from 2006 to 2018. This study examines the impact of exchange rate volatility on Indonesia's top exports to the five main export markets using GARCH model used to obtain an estimated value of exchange rate volatility, that found exchange rate volatility has a significant effect on exports of commodities to India, Japan, South Korea, and the United States, either in the short or long-run.

Chien & Tuyet (2020) conducted a study examining the impact of inward foreign investment, imports, and real exchange rate shocks on export performance in Vietnam using a time series dataset spanning from 2009 to 2018. They measured the effects of foreign investment, imports, and real exchange rate shocks on export performance using the Augmented Dickey-Fuller test and the vector error correction model with cointegration analysis. The study found that a higher value of imports significantly accelerated export performance in the short run, but this effect was insignificant in the long run. Additionally, the research highlighted that historically, countries worldwide tend to devalue their currencies to support export performance. Regarding exchange rate volatility, the study indicated that it affected external trade in the long run but had no effect in the short run. Finally, the findings suggested that Vietnam's export performance converged on its long-run equilibrium by approximately 6.3%, with adjustments occurring at a speed influenced by a combination of imports, foreign investment, and real exchange rate fluctuations.

Carrel & Wilfried (2021) conducted a study to assess the impact of exchange rates on trade using a series of exchange rate data spanning from January 2000 to December 2019. They employed the GARCH model to investigate this relationship and found that in the short run, fluctuations in exchange rates had a negative impact on both export and import dynamics. Additionally, exchange rate fluctuations were observed to significantly affect the prices of traded commodities and national income.

Mentiyev et al. (2021) analyzed the impact of exchange rates on international trade using data obtained from the OECD and World Bank covering the period from 2008 to 2020. The study employed correlation and multiple regression models to examine this relationship and found that exchange rate volatility had a significant impact on the trade balance in terms of both imports and exports. Additionally, they identified exchange rates as non-trade barriers that influenced foreign trade.

Tarasenko (2021) conducted an analysis of the impact of exchange rate volatility on the export and import of various goods between Russia and its trading partners from 2004 to 2018. Exchange rate volatility was measured using the standard deviation of

the first difference in the logarithmic daily nominal exchange rate, and the study utilized the gravity model. The findings revealed that exchange rate volatility had a negative impact on the export of goods. However, it had a positive and significant impact on trade in fuels and the import of chemicals and textiles.

Dada (2021) undertook a study to examine the effect of the asymmetric structure inherent in exchange rate volatility on trade in sub-Saharan African countries from 2005 to 2017. Exchange rate volatility was generated using the generalized autoregressive conditional heteroscedasticity (GARCH) model and the refined approach of the cumulative partial sum model. The study found that exchange rate volatility had a negative and significant effect on trade in the region.

## **2.4 Research Gap**

A body of economic literature explores the correlation between currency rates and export-related factors. Given the interconnected nature of economies in commerce and finance, many economies, including Nepal, have become increasingly integrated into the global market. While data limitations pose challenges, numerous studies exist, including recent ones, addressing the connection between the Real Effective Exchange Rate (REER) and exports. However, within this literature, contrasting viewpoints are present. Notably, there is a paucity of literature precisely delineating the extent and proximity of relationships among these variables.

Among the limited research available, Thapa (2002) empirically found that the traditional literature on real exchange rates applies to Nepal, suggesting that Nepal should stabilize its real exchange rate to enhance export benefits. Thapa employed the Elasticity technique, also known as the Marshall-Lerner condition of currency depreciation, in this study. Additionally, Paudel and Burke (2015) revealed that real exchange rate appreciation significantly harmed Nepalese exports, suggesting a reassessment of the peg rate with the Indian currency and advocating for a more flexible exchange rate to overcome challenges in export competitiveness. Similarly, Sapkota (2013) identified both positive and negative aspects of remittance flows in Nepal. The positive aspects include poverty reduction, inequality alleviation, a

favorable balance of payments position despite the absence of a prominent exporting product, and an increase in the central bank's foreign reserves. Conversely, the negative aspects involve the presence of Dutch disease, declining export competitiveness, and trade imbalances. Furthermore, Adhikari (2018) concluded in an NRB working paper that the depreciation of the Nepali rupee against the US dollar led to a reduction in Nepal's trade imbalance.

This study builds upon the work of Poudel & Burke (2015), where the model incorporates exchange rate policy and export performance, represented by variable X, as a proxy variable. The dependent variable X is determined by changes in the direction and magnitude of explanatory variables, including real GDP, population, partner country factors, bilateral real exchange rate, time trend, FDI, tariffs, Indi block, regional trade agreement dummy, END-MFA, MAO, natural logarithm, and error term. In this study, certain variables such as partner fixed effect, FDI, tariffs, Indi block, and END-MFA, which remain constant over time and are not explicitly represented in the model, have been omitted. Additionally, time fixed effects have been incorporated. This research carries a distinctive Nepalese perspective.

## 2.5 Literature Review Matrix

**Table 2.1: Literature Review Matrix**

<b>S. N</b>	<b>Author (s) and title of the articles, year</b>	<b>Objectives of the articles or research questions</b>	<b>Methodology used in the articles</b>	<b>Model specification/ Variables/ Issues</b>	<b>Strength/ innovation of the articles</b>	<b>Findings of the study</b>
1	Thapa (2002)	explore the relationship between the Real Effective Exchange Rate (REER) and GDP in the Nepalese economy	Simple Regression method	REER, and GDP.	Through the AD channel, a decrease in the real exchange rate implies that production costs rise, as indicated by the AS channel.	real exchange rate appreciation negatively affects both AD and real GDP
2	Sapkota (2013)	underscored the significance of remittance inflows and their implications on various sectors, including the exchange rate and external competitiveness	Simple Regression method	Real Effective Exchange Rate (REER) and remittance variables	The beneficial effects of remittance inflows include bolstering the economy and helping to alleviate poverty and inequality.	Nepal faces the challenge of managing remittance inflows effectively
3	Poudel & Burke (2015)	conducted a study on exchange rate policy and export performance in the context of Nepal	Utilizing the Augmented Gravity Model	Export, GDP of trading partners, population trading partners, bilateral real exchange	Analyzed the effects of the appreciation of Nepal's real exchange rate on its exports.	real exchange rate appreciation had a substantial negative effect on Nepal's

				rate index, FDI, import tariffs, Indian Blockade, regional trade agreements, and the Maoist		exports
4	Chaulagai (2015)	analyzed the impact of devaluation and tested the J-curve Hypothesis in the case of Nepal	utilized Vector Autoregressive (VAR) and Autoregressive Distributed Lag (ARDL) models	nominal effective exchange rate index (NEER), (TB), (REER), and trade balance (TB)	The depreciation of the nominal exchange rate is not a feasible solution for addressing Nepal's trade imbalance.	there was no evidence of a J-curve effect in Nepalese trade; instead, it operated as an L-curve
5	Panta & Budha (2016)	focused on examining the interconnections between remittances and exchange rates, drawing insights from Nepal	Ordinary Least Squares (OLS), Engle-Granger cointegration test, and the FM-OLS model	macroeconomic variables, and nominal exchange rate.	It is more practical for the monetary authority to expect increased remittance growth in the event of a depreciation of the nominal exchange rate of the Nepalese currency against the USD.	the depreciation of the Nepalese currency has a positive impact on remittance inflow.
6	Koirala (2018)	examined the influence of the real effective exchange rate (REER) on the	Engle-Granger residual-based test and an error correctio	the real effective exchange rate, broad money supply, trade	Gross fixed capital formation and broad money remain pivotal instruments in driving	findings of the study revealed a positive impact of the real effective

		economic growth of Nepal	n model	openness, and gross fixed capital formation	forward Nepal's economic progress..	exchange rate on Nepal's real GDP
7	Adhikari (2018)	investigated the effects of the exchange rate on the trade deficit and foreign exchange reserve in Nepal	Ordinary Least Squares (OLS) method	CPI_N, (TD) of Nepal, RESERVE, RGDP, and average exchange rate	The government and central bank could employ exchange rate policy to a certain degree to tackle the trade deficit and uphold adequate foreign exchange reserves.	one percentage point depreciation of the Nepalese rupee (NRP) relative to the US dollar resulted in an increase in reserves by 0.85 percentage points and a decrease in the trade deficit by 6.75 percentage
8	Devkota & Panta (2019)	examined the presence of a cointegrating relationship between exports, imports, and the USD exchange rate in Nepal	The Augmented Dickey-Fuller unit root test and Johansen's multivariate cointegration test	exports, imports, and the USD exchange	Cointegration indicates that macroeconomic policies in Nepal have failed to achieve a long-term balance between exports and imports, suggesting a breach of Nepal's international budget constraint.	the absence of a cointegrating relationship between exports, imports, and the USD exchange rate in Nepal, thereby precluding the estimation of a causal relationship within the Vector Error

						Correction Model
9	Dumre (2019)	explored the influence of the exchange rate, imports, and exports on the economic development of Nepal	employed the Ordinary Least Squares (OLS) method	Gross Domestic Product (GDP), foreign exchange rate, Export, and Import.	The objective of this study was to examine the correlation between fluctuations in foreign exchange rates, exports, imports, and the gross domestic product (GDP) of Nepal.	statistically significant relationship between all independent variables and dependent variables.
10	Pun (2020)	analyzed the prospective influence of the exchange rate on exports within the Nepalese context	the Autoregressive Distributed Lag (ARDL) model	real interest rate, investment, and inflation rate.	The impact of exchange rate volatility on overall exports in the context of Nepal.	revealing a significant positive relationship between the exchange rate and exports in Nepal.
11	Reshmi (2021)	aimed to assess the influence of the exchange rate on the economic growth of Nepal	used a linear regression model	NPR- US dollar exchange rate, Inflation, and GDP	The influence of exchange rate volatility on the total GDP of Nepal.	revealing a positive and significant relationship between the exchange rate and GDP.



12	Gautam (2021)	delved into examining the correlation between the real effective exchange rate and trade balance in Nepal.	the Engle-Granger cointegration test and Error Correction Model.	TB, REER, Remittance, Nominal GDP, GDP deflator.	Explore the correlation between the real effective exchange rate and the trade balance in Nepal.	real effective exchange rate and real GDP significantly contribute to an increase in the trade deficit.
13	Khadka (2021)	conducted an investigation into the impact of the real exchange rate and its volatility on the real exports of Nepal	employed Ordinary Least Squares (OLS) estimation	CPI_N, exchange rate of NC per USD, Trade share, Exp, Remit, GDP_N, REER	Seek to assess the current state of Nepal's export competitiveness, which is perceived to be declining due to the substantial inflow of remittances in recent times.	there is no statistically significant effect of the real exchange rate on Nepal's exports
14	Joshi et al. (2023)	analyzed the influence of the exchange rate on exports in Nepal	utilized the ARDL bounds test	exchange rate, import, money supply, and GDP	The objective of this study is to investigate the influence of the exchange rate on exports in Nepal, given that Nepal's exchange rate is fixed or pegged to that of India.	revealing both long-run and short-run impacts of the exchange rate on Nepal's exports
15	Chowdhury (1993)	investigated the influence of exchange rate volatility on trade flows within the G-7 nations	multivariate error-correction techniques	R, X, Y, P, and V	This study examines the dynamic correlation between export volume and a measure of exchange	revealing a consistently adverse effect on export volumes across all G-7 countries

					rate volatility within a framework of multivariate error correction.	
16	Bahmani-Oskooee & Payesteh (1993)	analyzed how the trade flows of six developing countries respond to exchange rate volatility	standard econometric methods	Domestic income, Trade, Exchange rate, D_W.	Analyzed the impact of fluctuations in exchange rates on trade movements..	found evidence suggesting negative impacts of exchange rate uncertainty on trade volume.
17	Saang Joon (2004)	examined how exchange rate volatility affects exports across 14 Asia-Pacific nations	Ordinary Least Squares (OLS) models, fixed effects models, and random effects models	Real Export, Real GDP, $DEXR_{ijt}$ , $VOL_{ijt}$	Substantial adverse effect of exchange rate fluctuations on export volume.	identifies a noteworthy adverse effect of exchange rate volatility on export volume
18	Fountas & Aristotelous (2005)	examined the influence of exchange rate regimes on exports	econometric methods such as multivariate cointegration and error-correction models	Each country exports to the other seven countries.	effect of different exchange rate systems on exports	the short-term effect of exchange rate volatility on intra-EU export volume is not statistically significant
19	Yarmukhamedov (2007)	explored the trade impact of exchange rate fluctuations in Sweden	Employing the EGARCH model	Export, REER, IPI, and Volatility	The quantities of exports and imports are examined in terms of their factors, which include	trade effects of exchange rate fluctuations and identifies a negative

					volatility in exchange rates.	association between exports and imports.
20	Chit et al. (2008)	investigated the relationship between exchange rate volatility and exports	Employing the gravity model	Real Export, Home income, FI, RP, and VOL	adverse effect of exchange rate instability in emerging East Asia	reveals a negative effect of exchange rate volatility on the exports of emerging East Asian nations
21	Berdiev et al. (2011)	investigated the factors influencing the selection of exchange rate regimes, including government ideology, political institutions, and globalization trends	panel multinomial logit approach	exchange rate regime, government ideology	Political economy considerations have varying influences on the selection of exchange rate systems in both developed and developing nations.	governments, democratic institutions, central bank independence, and financial development increase the likelihood of adopting a flexible exchange rate regime
22	Sabri et al. (2012)	explored the effects of exchange rate volatility on trade between the Southern and Northern regions	Vector Autoregressive Regression model	Export and Import	Financial connections overall, and specifically currency exchange rates, within the context of South-North relations.	exports of goods from Egypt to the EU declined by approximately 3% compared to the baseline
23	Eichengreen & Gupta	investigated the relationship between the	regression analysis, accounting	Export, RPCI, IFS, PPP, RER, VOL, FDI	The expansion of export quantities and	The significance of the real exchange

	(2012)	real exchange rate and export growth	g for heteroskedasticity and autocorrelation model		instances of what are known as export surges, characterized by prolonged periods of rapid export growth.	rate for export expansion.
24	Nicita (2013)	investigated the interplay between exchange rates, international trade, and trade policy	standard gravity model	Trade value, GDP_I, and misalignment	Evidence that suggests trade policy is utilized to offset some of the repercussions of a currency that is deemed to be overvalued.	the significant impact of currency misalignments on international trade
25	Nyeadi et al. (2014)	examined the influence of exchange rate fluctuations on exports	Ordinary Least Squares (OLS) model	Exchange rate and Export	The difficulties associated with exporting goods in Ghana, with the aim of enhancing the country's export activities.	exchange rate movements do not have a significant impact on the export of goods and services in Ghana
26	Gene & Artar (2014)	explored the impact of exchange rates on exports and imports of emerging countries	Panel Cointegration method	EXC, EXP, and IMF	There exists a co-integrated connection among the effective exchange rates of chosen emerging nations.	cointegrated relationship between the effective exchange rate and the export-import dynamics of emerging nations
27	Lotfali pour &	aimed to assess the impact of	unit root tests and the	Export, Import, and Exchange	The rise in volatility of the exchange	the real exchange rate does

	Bazargan (2014)	real effective exchange rate volatility on Iran's trade balance	GARCH approach	Rate Volatility	rate has affected trade.	not have a significant effect on the trade balance
28	Shaikh & Hongbing (2015)	investigated the influence of exchange rate fluctuations on trade flows in China, Pakistan, and India	standard deviation of the moving average of the logarithm of the exchange rate, and the Autoregressive Distributed Lag approach	Export, Relative price, GDP, and Vol	Utilizing co-integration to gauge the impact of exchange rate volatility on exports.	In the short run, exchange rate volatility is negatively correlated with Chinese exports but positively correlated in the long run.
29	Imoughele & Ismaila (2015)	investigated the influence of exchange rates on non-oil exports	Augmented Dickey-Fuller (ADF) test for unit root analysis and Johansen's co-integration test	non-oil exports and independent variables	Monetary authorities in Nigeria should give precedence to maintaining exchange rate stability to alleviate inflationary pressures.	significantly impact the growth of non-oil exports in the Nigerian economy
30	Ahmed (2017)	investigated the influence of exchange rates on exports in Pakistan	ADF, PP, and ARDL tests	Export, Exchange rate, and GDP	The impact of fluctuations in exchange rates on overall exports within a selected sample from Pakistan.	the exchange rate has a negative but statistically insignificant impact on Pakistan's exports
31	Palazzo & Rapetti	examined the relationship between the	manipulated simple	EER and Export	Focused on the export of Argentina	export promotion could be

	i (2017)	real exchange rate and export performance in Argentina	equations			supported by the RER for economic growth, utilizing both macroeconomic and microeconomic channels.
32	Miranda & Mordecki (2017)	conducted a study on real exchange rate volatility and exports	Johansen's methodology	Export, RER, RERV, and LPR	Assess the relationship between export levels and exchange rate volatility in the remaining countries.	exports depended positively on global demand and international prices
33	Oluyemi & Essi (2017)	investigated the impact of exchange rates on imports and exports in Nigeria	Augmented Dickey Fuller (ADF), VAR model	Export, Import, and Exchange rate	Decrease import demand and boost Nigeria's exports.	exchange rates in Nigeria were not significantly impacted by the activities of imports and exports
34	Hunegnaw (2017)	conducted research on the effect of the real exchange rate on manufacturing exports in 10 East African countries	Employing the ARDL (Auto Regressive Distributed Lag) method	real exchange rate, and Export	Create a favorable environment for economic growth without resorting excessively to the devaluation of the domestic currency.	an increase in real GDP positively impacted manufacturing exports, and a rise in foreign real GDP also improved manufacturing exports
35	Ngondo & Khoba	conducted an assessment of the impact	Autoregressive Distributed	Export, Exchange Rate, real	The correlation between the	a significant negative relationship

	i (2018)	of the exchange rate on exports in South Africa	ed Lag (ARDL), ADF, and PP test	interest rates, investments, and inflation	exchange rate and exports in South Africa.	between the exchange rate and exports in South Africa.
36	Bostan et al. (2018)	focused on examining the effect of exchange rates on international commercial trade	OLS (Ordinary Least Squares) method	Exchange rate, Interest rate, HICP, PI, and FDI	Focused on increasing exports rather than import	national currency depreciation reduced the competitiveness of foreign products, leading to a negative influence on imports
37	Hien et al. (2019)	conducted an investigation into whether Asian developing countries have been experiencing Dutch disease	The OLS method	remittance, real exchange rate, and Dutch disease	The adoption of a floating exchange rate led to a mitigated appreciation of the real exchange rate driven by capital inflows.	remittance per capita increased by 1%, the real effective exchange rate of these countries appreciated by 0.103%, thereby, thus supporting the existence of Dutch disease for countries with a higher remittance ratio
38	Youssef & Zaki (2019)	analyzed the export performance and exchange rate patterns of Egypt in a	the gravity model	Exchange Rate, and Export	This involves promoting and broadening domestic manufacturing	exchange rate depreciation alone is not adequate to improve and

		Policy Research Working Paper of the World Bank Group			capabilities while eliminating non-tariff trade barriers such as administrative, technical, and sanitary constraints.	increase the country's exports, as price competitiveness represents only one aspect of a nation's ability to enhance its external competitiveness
39	Subanti et al. (2019)	conducted a study on the impact of exchange rate volatility on exports using panel data from five ASEAN countries	pooled least squares, fixed effect, and random effect methods	EXPORT, GDPC, REPRICE, and VOLEXRATE	Each central bank should implement sustainable and stable exchange rate policies aimed at fostering greater stability in exchange rates, which would in turn contribute to the improvement of real exports.	indicated that exchange rate volatility had a negative impact on exports
40	Gallo et al. (2020)	analyzed the effects of exchange rate uncertainty on exports	Autoregressive model	Exchange Rate, and Export	The economic attributes, which include the flexibility or constraints on export adjustments stemming from uncertainty in exchange rates.	negative impact on manufacturing-exporting countries, while commodity-exporting countries were not significantly affected



41	Putri et al. (2020)	sought to ascertain the impact of exchange rates and freight costs on the export volume of ADIDAS	explanatory research method	Exchange rate, Freight, and EV	Boost exports by decreasing shipping expenses.	negative and significant effect on the export volume of ADIDAS.
42	Khachatryan & Grigoryan (2020)	conducted an empirical examination of the relationship between the real exchange rate and exports of Armenia	employed a regression model	real exchange rate and exports	The diminishing connection between exchange rates and exports, especially within the framework of a developing nation such as Armenia.	exchange rate volatility did not have a statistically significant effect on exports
43	Morina et al. (2020)	examined the effect of real effective exchange rate volatility on economic growth in the central and Eastern European countries	standard deviation and z-score model	GDP, GEXP, GFCF, INFL, OPEN, and DOMCR	Primary driver of economic growth, necessitating vigilance from monetary authorities and governments through the implementation of an exchange rate policy.	exchange rate has a significant negative effect on real economic growth.
44	Sugiharti et al. (2020)	examined the impact of exchange rate volatility on Indonesia's top exports to the five	GARCH model	Export, IIP, RER, and Vol	Fluctuations in the exchange rate have a detrimental impact on Indonesian exports.	exchange rate volatility has a significant effect on exports of commodities

		main export markets, namely China, India, Japan, South Korea, and the United States				s
45	Chien & Tuyet (2020)	conducted a study examining the impact of inward foreign investment, imports, and real exchange rate shocks on export performance in Vietnam	Augmented Dickey-Fuller test and the vector error correction model	EXP, IMP, NUM, REGISTER, and GROWTH	Nations globally often choose to depreciate their currencies to bolster their export performance.	higher value of imports significantly accelerated export performance in the short run, but this effect was insignificant in the long run
46	Carrel & Wilfried (2021)	conducted a study to assess the impact of exchange rates on trade	employed the GARCH model	DII, CPI, GDP, FR, SPI, DIR, and RER	Analyzing the trade effects of exchange rates in Congo by examining its trading partners.	in the short run, fluctuations in exchange rates had a negative impact on both export and import dynamics
47	Mehtiyev et al. (2021)	analyzed the impact of exchange rates on international trade using data obtained from the OECD and World Bank	employed correlation and multiple regression models	Exchange rate, Export, and import	This research examines and analyzes the effects of currency volatility on exports, particularly demonstrated through the devaluation of Azerbaijan's currency.	exchange rate volatility had a significant impact on the trade balance in terms of both imports and exports
48	Tarase	conducted an	The	Export,	The influence	exchange

	nko (2021)	analysis of the impact of exchange rate volatility on the export and import of various goods	gravity model	Import, MER, GDP, FD, OECD, and ERvol	of volatility on both exports and imports within the Russian Federation.	rate volatility had a negative impact on the export of goods.
49	Dada (2021)	undertook a study to examine the effect of the asymmetric structure inherent in exchange rate volatility on trade in sub-Saharan African	generalized autoregressive conditional heteroscedasticity (GARCH) model	TRADE, GDP, WGDP, REER, NEGVOL, and SVOL	The research indicates that there is a pattern of clustering in exchange rate volatility, which remains consistently persistent across sub-Saharan African nations.	exchange rate volatility had a negative and significant effect on trade in the region.

## **CHAPTER-III**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This section discusses the methodology employed in the research. It encompasses the research framework, types, and origins of data, timeframe of the sample, data structuring and manipulation, as well as techniques for data analysis and estimation.

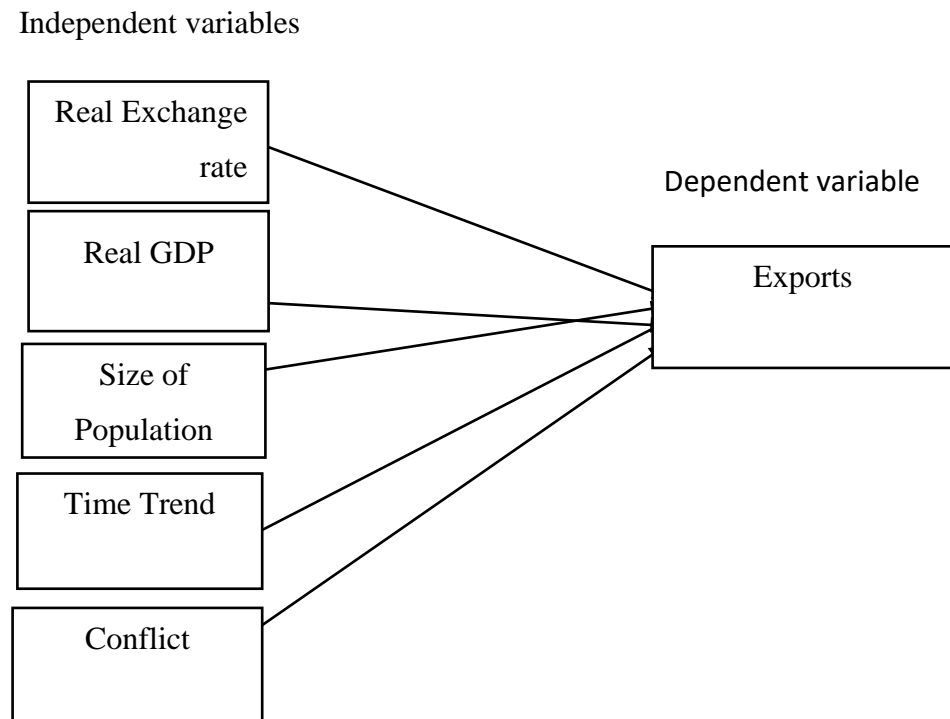
#### **3.2 Research Design**

The research methodology employed in this study is both descriptive and analytical. It utilizes a quantitative approach, especially employing a retrospective longitudinal design to investigate the correlation between dependent and independent variables. Data for the study were retrospectively collected from adjusted records. The primary aim of the research is to assess the influence of the exchange rate on exports in Nepal. To achieve this objective, both analytical and descriptive research designs are utilized. Analytical research aids in evaluating the significance of exchange rates on exports, while descriptive research focuses on elucidating variable trends.

Descriptive statistics encompass various parameters such as the number of observations, mean, standard deviation, minimum, and maximum, among others, for the different variables utilized. Additionally, numerous econometric tools and techniques have been employed to refine and obtain precise results. Initially, the equation's content (Eqn. 2) is estimated using a simple regression model to determine the degree and direction of the relationship between exchange rates and exports. To assess the reliability of these findings, tests such as the Durbin-Watson test for the error term and the Breusch-Pagan test for Heteroskedasticity are conducted. The primary objective of these tests is to ensure the validity of the outcomes derived from the estimated model.

### 3.3 Conceptual framework

The conceptual framework serves as an essential component of a research paper, aiding in elucidating the research concept. A well-defined conceptual framework proves advantageous in various aspects, including data collection, the formulation of research design, and the development of econometric models. Furthermore, it facilitates comprehension of the relationships between different variables, such as independent and dependent variables. To ensure a clear understanding of the concept under investigation in this study, the conceptual framework has been illustrated in the accompanying figure.



**Figure 3.1 Conceptual Framework**

### 3.4 Sources of Data

This research utilizes secondary data spanning from 1990 to 2019. The selection of this timeframe is attributed to the constraint of unavailable panel data both nationally

and internationally. Throughout the study period, secondary data is collected from various national and international sources, primarily accessed through websites. Data for different variables are gathered from databases such as the Nepal Rastra Bank and the World Bank's repository.

### 3.5 Techniques of Data Analysis/Model

The data analysis in this study used both analytical and descriptive approaches. Various statistical tools, including tables, graphs, and charts, will be utilized for presentation purposes.

#### Real Effective Exchange rate

The Real Effective Exchange Rate (REER<sub>i</sub>) was determined using the formula provided below.

$$REER_i = \prod_i \frac{p}{p_{fi}^{twi}} NEER \dots \dots \dots 1$$

Where:

REER<sub>i</sub> represents the real effective exchange rate between Nepal and country i,

p denotes the domestic price level,

p<sub>fi</sub> denotes the price level of foreign country i,

twi represents the trade-weighted index for country i,

and NEER denotes the nominal exchange rate.

#### International trade and real effective exchange rate

The connection between fluctuations in the exchange rate and the quantities of exports for goods and real GDP is evaluated through a straightforward regression model. This model includes a series of fixed effects to account for all typical determinants of trade flows, as usually incorporated in basic regression models. Specifically, the influence of exchange rate on exports is determined by the following formulas:

Explore the exchange rate impact on the export performance of Nepal shows in the Following empirical model.

$$(x_{it}) = \beta_0 + \beta_1(REER_{it}) + \beta_2(GDP_{it}) + \beta_3(POPS_{it}) + \beta_4(INDIBLOCK_{it}) + \beta_5(CONF_{it}) + \varepsilon_{it} \dots \dots 2$$

Where:

t represents the year,

$\varepsilon_{it}$  represents signifies the error term

Details regarding the variables are elaborated below.

$x_{it}$  indicates the level of exports of Nepal.

$REER_{it}$  denotes the real effective exchange rate index in year t, computed using the formula in equation (1). It reflects the positive or negative relationship with exports.

$GDP_{it}$  represents the real gross domestic products of Nepal.

$POPS_{it}$  represents the size of producer and consumer markets in terms of population of Nepal.

$INDIBLOCK_{it}$  indicates the Indian trade Blockade.

$CONF_{it}$  represents a dummy variable for the years during which there was a city-focused armed conflict. It takes the value 1 for the years 2002 to 2007 and 0 otherwise.

To analyze the export performance with cross country shows in the following model.

$$\log(x_{it}) = \beta_0 + \beta_1 \lg(REER_{it}) + \beta_2 \lg(GDP_{it}) + \beta_3 \lg(POPS_{it}) + \beta_4(TREND_{it}) + \beta_5(CONF_{it}) + \varepsilon_{it} \dots \dots 3$$

Where:

L denotes the natural logarithm,

t represents the year, and

$\varepsilon_{it}$  represents signifies the error term

We provide robust standard errors, employing Durbin-Watson for assessing serial autocorrelation and Breusch-Pagan for heteroskedasticity. Details regarding the variables are elaborated below.

$X_{it}$  indicates the level of exports from the Nepal federation to country  $i$  in year  $t$ .

$REER_{it}$  denotes the real effective exchange rate index in year  $t$  with the partner country, computed using the formula in equation (1). It reflects the positive or negative relationship with exports.

$GDP_{it}$  represents the real gross domestic products of Nepal and the partner country  $i$ .

$POPS_{it}$  represents the size of producer and consumer markets in terms of population of Nepal and partner country  $i$ .

$TREND_{it}$  indicates the time trend designed to capture secular changes in Nepal's exports over time. Time series data are utilized for both dependent and explanatory variables.

$CONF_{it}$  represents a dummy variable for the years during which there was a city-focused armed conflict. It takes the value 1 for the years 2002 to 2007 and 0 otherwise.



## CHAPTER-IV RESULTS AND DISCUSSION

### 4.1 Trend of Exports

In this section, a brief analysis is conducted on the nature and trend of Nepal's exports.

#### 4.1.1 Trend of Export (1990-2019)

Exports constitute one of the variables under examination in this study. Its trend is depicted in Figure 4.1.1, as illustrated in the following graph.

**Figure 4.2 Export of Nepal**



Source: World Bank's World Development Indicators.

The illustration in Figure 4.1 depicts the trajectory of Nepal's exports over the period from 1990 to 2019. It demonstrates that this variable fluctuated across the mentioned timeframe. Nepal's exports exhibited a rising trend until 2001, followed by a decline in 2002 attributed to conflict. Subsequently, from that point onward, Nepal's exports

experienced growth until 2014. However, there was a decrease in exports in 2016 due to the earthquake that struck Nepal in 2015. Nevertheless, post this event, Nepal's exports demonstrated consistent growth, as depicted in Figure 4.1.

#### 4.2 Descriptive analysis of the variables

The descriptive statistics for exports, real GDP, REER, populations, and CONF encompass the number of observations, mean values, standard deviations, median values, minimum values, and maximum values, as outlined in the following table. Each variable is expressed in thousands of natural logarithms (ln). Variables denoted in currency units are presented in thousands of rupees.

**Table 4.1: Descriptive analysis**

	POP_N	GDP_N	REER	CONF	EXPORTS
N	30	30	30	30	30
Mean	24439.47	11574630.43	87.90	0.20	1427776.61
Standard deviation	3379.19	8332727.80	11.43	0.41	625117.53
Median	25106.98	7702096.50	87.36	0.00	1287133.49
Minimum	18111.20	3401212.00	69.38	0.00	381884.48
Maximum	28982.77	30600000.00	106.34	1.00	2659663.14

Source: Author's Calculation

Table 4.2 presents the statistical summary for various variables. The mean population of Nepal is Rs. 24,439.47 thousand, with a standard deviation of Rs. 3,379.19 and a median of Rs. 25,106.98. The minimum and maximum population values are Rs. 18,111.20 and Rs. 28,982.77, respectively. Similarly, the mean real GDP\_N stands at Rs. 11,574,630.43 thousand, with a standard deviation of Rs. 8,332,727.80 and a median of Rs. 7,702,096.50. The minimum and maximum real GDP\_N values are Rs.

3,401,212.00 and Rs. 30,600,000.00, respectively. The mean value of REER is Rs. 87.90 thousand, with a standard deviation of Rs. 11.43 and a median of Rs. 87.36. The minimum and maximum REER values are Rs. 69.38 and Rs. 106.34, respectively. Additionally, the mean CONF value is Rs. 0.20 thousand, with a standard deviation of Rs. 0.41 and a median of Rs. 0.00. The minimum and maximum CONF values are Rs. 0.00 and Rs. 1.00, respectively. Finally, the mean exports value is Rs. 1,427,776.61 thousand, with a standard deviation of Rs. 625,117.53 and a median of Rs. 1,287,133.49. The minimum and maximum export values are Rs. 381,884.48 and Rs. 2,659,663.14, respectively.

### **4.3 Empirical Estimation**

Table 4.2 serves as a summary of Equation (2), aimed at studying the impact of the exchange rate on Nepal's exports. While the signs of the coefficients generally align with theoretical expectations, there are instances where they exhibit an opposite direction. It is the individual estimation of Nepal exports, not cross-country estimation. The results are presented in the next page.

**Table: 4.2: Individual Regression estimation results**

Dependent variable: Nepal' exports

---

Export	
REER	-5.307** (0.073)
GDPN	1.347*** (0.004)
IND_B	-1.761** (0.013)
Pop_N	6.362*** (1.13)
CONF	4.581 (0.236)

---

Observations	30
R2	0.954
F Statistic	98.604*** (df = 5; 24)

---

Note: \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Source: Authors' calculations using data from the World Bank's World Development Indicators; NRB website, Ministry of Finance.

Table 4.2 displays the results of our estimation of Equation (2). In Model, the coefficients are as follows: REER is -5.307\*\* (P-value= 0.073), GDP\_N is 1.347\*\*\* (P-value= 0.004), IND\_B is -1.761\*\* (P-value= 0.013), Pop\_N is 6.362 (P-value= 1.13), and CONF is 4.581 (p-value = 0.236). the model has 30 observations.

The coefficient of the real exchange rate variable (REER) is statistically significant for total merchandise exports, indicating that a 1% decrease in the Nepalese Rupee to foreign currency is associated with an increase in Nepal's merchandise exports. The GDP of the exporting country is statistically significant in the Model, with the

coefficient suggesting that a 1% increase in the GDP on average is associated with an increase in exports from Nepal. However, the population size is statistically significant in the Model, suggesting that an increase in population size is associated with an increase in exports from the domestic country.

Table 4.3 serves as a summary of Equation (3), aimed at studying the impact of the exchange rate on Nepal's exports. While the signs of the coefficients generally align with theoretical expectations, there are instances where they exhibit an opposite direction. Contrary to the findings suggested by existing literature (Paudel & Burke, 2015; Nondo & Knobai, 2018; Miranda & Modecki, 2017; Chit et al., 2018), which propose a negative relationship between exchange rate and exports, the empirical estimation reveals significant effects of the real effective exchange rate, with both negative and positive signs, on Nepal's exports.

The coefficient estimates of the real effective exchange rate represent a measure of REER elasticity, reflecting the price competitiveness of exports. Additionally, the coefficient estimate of domestic real GDP is positive, indicating that domestic real GDP positively influences Nepal's exports. Conversely, the coefficient estimate of the partner country's GDP is negative, implying a promotion of Nepal's exports. The roles played by both partner countries' real GDP and domestic real GDP could have significantly impacted the observed export figures of Nepal. It is the cross-country estimation result. The results are presented on the following page.

**Table: 4.3: Regression estimation results**

Dependent variable: Nepal's annual exports to partner country

---

	l <sub>exp</sub>	
	Model 1	Model 2
	(1)	(2)
lnREER	-1.833*** (0.089)	-1.286*** (0.0000)
lnGDPN	0.804*** (0.015)	0.096** (0.030)
lnGDP_p	-0.039** (0.017)	0.007 (0.553)
ltpop	0.044 (0.034)	-0.004 (0.905)
lpop		-0.396*** (0.0004)
TimeTD		0.056*** (0.0000)
CONF		-0.157*** (0.0000)

---

Observations	600	600
R2	0.929	0.956
F Statistic	1,848.567*** (df = 4; 571)	1,735.015*** (df = 7; 568)

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Note: \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Source: Authors' calculations using data from the World Bank's World Development Indicators; NRB website.

Table 4.3 displays the results of our estimation of Equation (2). In Model 1, the coefficients are as follows:  $\ln REER$  is  $-1.833^{***}$  (P-value= 0.089),  $\ln GDP\_N$  is  $0.804^{***}$  (P-value= 0.015),  $\ln GDP\_P$  is  $-0.039^{**}$  (P-value= 0.017), and  $itppop$  is  $0.044$  (P-value= 0.034). Similarly, in Model 2, the coefficients are:  $\ln REER$  is  $-1.286^{***}$  (P-value= 0.000),  $\ln GDP\_N$  is  $0.096^{**}$  (P-value= 0.030),  $\ln GDP\_P$  is  $0.007$  (P-value= 0.553),  $itppop$  is  $-0.004$  (P-value= 0.905), Time TD is  $0.056^{***}$  (P-value= 0.000), and CONF is  $-0.157^{***}$  (P-value= 0.000). Both models have 600 observations.

For Model 1, the coefficient of the real exchange rate variable (REER) is statistically significant for total merchandise exports, indicating that a 1% decrease in the Nepalese Rupee to foreign currency is associated with an increase in Nepal's merchandise exports to partner countries. The logarithm of the GDP of the exporting country is statistically significant in Model 1, with the coefficient suggesting that a 1% increase in the GDP on average is associated with an increase in exports from Nepal. Similarly, the logarithm of the GDP of the importing country is statistically significant in Model 1, with the coefficient indicating that a 1% decrease in the GDP on average is associated with an increase in imports in the importing country. However, the logarithm of the population size is statistically non-significant in Model 1, suggesting that an increase in population size is associated with an increase in exports from the domestic country.

Similarly, in Model 2, the coefficient of the real exchange rate variable (REER) is statistically significant for total merchandise exports, indicating that a 1% decrease in the Nepalese Rupee to foreign currency is associated with an increase in Nepal's merchandise exports to partner countries. The logarithm of the GDP of the exporting country is statistically significant in Model 2, with the coefficients suggesting that a 5% increase in the GDP on average is associated with an increase in exports from Nepal. However, the logarithm of the GDP of the importing country is statistically non-significant in Model 2. This suggests that if the GDP of the importing country increases, there might be a decrease in exports from Nepal. Similarly, the logarithm of the population size is statistically non-significant in Model 2, indicating that changes in the population size of the partner country may not significantly affect Nepal's

exports. However, in Model 2, the logarithm of the population size of the domestic country is statistically significant, with the coefficient suggesting that a 1% decrease in the population size on average is associated with an increase in exports from Nepal.

In Model 2, the time trend is statistically significant, with the coefficient indicating that a 1% increase in the time trend on average is associated with an increase in exports from Nepal. Additionally, the period of the conflict movement is statistically significant in Model 2, with the coefficient suggesting that a 1% increase in the period of abnormal poor export performance of Nepal, during the armed conflict in Nepal, is associated with a decrease in exports.

The reported R-squared (R<sup>2</sup>) values are 0.929 and 0.956 in Model 1 and 2, respectively. This indicates that approximately 92.9% and 95.6% of the variation in exports from Nepal can be explained by the independent variables in each model. While high R<sup>2</sup> values may signal potential imprecision in predictions due to unaccounted heavily weighted variables outside the model, our primary focus is on understanding the relationships among the variables. The high R<sup>2</sup> values, coupled with significant estimated coefficients, suggest that the considered variables may have been selected without bias.

This result demonstrates a negative and significant relationship between the exchange rate and exports of Nepal.

The initial stage in investigating the relationship between the variables involves conducting the Durbin-Watson test and Heteroskedasticity test for each variable, as outlined below.

#### **4.3.1 Durbin-Watson Test**

The Durbin-Watson test for serial autocorrelation has been conducted. The null hypothesis of this test is that the error variance is constant. A p-value less than 0.05 indicates rejection of the null hypothesis, suggesting the absence of autocorrelation and the presence of autocorrelation in the model. Therefore, the claim is that the error variance is constant.



The Durbin-Watson test for serial autocorrelation yielded a p-value less than 0.05, indicating rejection of the null hypothesis, which posits constant variance of error terms, thus suggesting the presence of autocorrelation in the model. This issue has been addressed by employing robust standard errors in the model.

#### 4.3.2 Heteroskedasticity Test

The Heteroskedasticity test was conducted using the Breusch-Pagan test. The null hypothesis of this test is that the error variance is constant. A p-value less than 0.05 indicates rejection of the null hypothesis, suggesting the absence of homoskedasticity and the presence of heteroskedasticity in the model. Therefore, the claim is that the error variance is constant.

The Breusch-Pagan test for heteroskedasticity resulted in a p-value less than 0.05, indicating rejection of the null hypothesis, which assumes constant variance of error terms. This suggests the presence of heteroskedasticity in the model. To address this issue, robust standard errors have been implemented in the model.

#### 4.3.3 PF-test for individual effect

This test has been conducted to determine whether the use of the pooled method for robust standard errors, alongside the fixed method, is consistent. Among several methods available, the pooled method for robust standard error has been employed.

**Table 4.4: PF-test for individual effect**

F	df1	df2	P-value
0.26429	23	571	0.9998

Alternative hypothesis: significant effect

From the above table 4.3.3 PF-test for individual show that  $F= 0.26429$ ,  $df1= 23$ ,  $df2= 571$ , and P-value is 0.9998 respectively. Alternative hypothesis is significant effect, so fixed method is consistent in PF- test.

**Table 4.5: PF-test for individual effect**

F	df1	df2	P-value
0.012489	22	568	1

Alternative hypothesis: significant effect.

From the above both table 4.3.4 PF-test for individual show that  $F= 0.012489$ ,  $df1= 22$ ,  $df2= 568$  and P-value is 1 respectively. Alternative hypothesis is significant effect, so fixed method is consistent in PF- test.

The estimation equation (2), as specified in section 3.5 of Chapter III, along with a summary of findings, is presented in Table 4.4. Interpretation of the results has been conducted, drawing possible comparisons with existing literature supported by fact-based arguments.

## **CHAPTER-V**

### **CONCLUSION AND POLICY IMPLICATIONS**

This study aims to examine the impact of the exchange rate on Nepal's exports and assess the country's export competitiveness deterioration. Given the significance of export promotion in Nepal, this paper endeavors to contribute to the discourse by analyzing panel data spanning from 1990 to 2019. Regression equations have been employed to operationalize the identified objectives, with the baseline model (Eqn. 2) estimated to provide insights. The summary of findings is presented in Table 4.4. Additionally, the degree and directional relationship between the exchange rate and real exports have been assessed using the simple regression model, as outlined in section 4.2 and 4.3 of Chapter 4.

#### **5.1 Findings**

The impact of the exchange rate on Nepal's exports has been established through the presence of a significant estimated coefficient. However, the first lag of REER change, changes in domestic real GDP, changes in exports, and changes in trading of partner countries have failed to yield significant estimated coefficients. This suggests that, at least statistically, the considered variables, except for domestic real GDP, do not significantly influence Nepal's exports. In Model 1 of Table 4.3, a 1% increase in domestic real GDP corresponds to an 80.4% increase in Nepal's exports.

In Model 2, as shown in Table 4.3, the instruments used include the first lag of REER change, changes in domestic real GDP, and changes in Nepal's exports. In this model, a 1% change in REER is associated with an increase in Nepal's exports, and domestic real GDP is found to be statistically significant at the 5% level. This suggests that Nepali export growth is influenced by changes in domestic real GDP. Additionally, changes in the size of the population and the time trend also contribute to changes in exports from the domestic country.

## 5.2 Conclusion

It has explored the influence of the exchange rate on Nepal's exports, particularly in elucidating the country's subpar export performance. Our findings suggest that, when accounting for other pertinent factors, the appreciation of the real exchange rate has significantly hindered Nepal's exports. Specifically, the appreciation of Nepal's real exchange rate compared to a basket of 25 partner countries over the period from 1990 to 2019. It has been linked to a decline in merchandise exports from Nepal. Notably, Nepal's real exchange rate has experienced more pronounced appreciation against currencies of third-party markets, indicating a particularly adverse impact on exports to these markets.

The findings underscore the export competitiveness implications of pegging the Nepalese rupee to the Indian rupee. During the first decade of the new millennium, this currency peg led Nepal into a trap of export competitiveness, as domestic inflation and the appreciation of the Indian Rupee resulted in an overvaluation of the real exchange rate. However, it's important to note that this situation may not always persist, as depreciations of the Indian Rupee could potentially benefit Nepal's export competitiveness at different times. Nevertheless, a notable aspect of Nepal's current exchange rate regime is that real exchange rate appreciations, particularly against third-country markets, can occur for reasons unrelated to Nepal's economy, such as appreciation in the Indian Rupee relative to other currencies. Additionally, rapid inflation in Nepal exacerbates this issue.

The choice of exchange rate regime involves various considerations, especially in avoiding export competitiveness traps. The findings suggest that Nepal may benefit from reconsidering its current pegged exchange rate system, either by adjusting the peg rate or transitioning to a more flexible exchange rate system. Nepal could draw insights from countries like Botswana, which maintains a crawling peg, or other landlocked developing nations like Paraguay, which have adopted floating exchange rates.

Moreover, Nepal has additional opportunities to enhance its export performance. Improving transport infrastructure, for instance, could help reduce transport costs to global markets. Enhancing airports to facilitate the export of high-value, low-weight goods could be particularly promising. While Nepal may be landlocked, it is not airlocked, suggesting that a focus on facilitating air-freighted exports could be an effective strategy to reverse the decline in Nepal's goods exports to countries beyond India. Ultimately, the significant and inverse relationship between the exchange rate and Nepal's exports underscores the importance of carefully considering exchange rate policies in fostering export growth.

### **5.3 Recommendations**

The implementation of policies for exportable goods and services should be treated as a matter of urgency, akin to a state emergency. Nepal's high dependence on India and third nations, even for agricultural products, raises concerns about overall national security. Instead of expending resources on formulating policies, Nepal should prioritize investing resources in action-oriented strategies to produce exportable goods and services that leverage absolute and comparative advantages. It's crucial to shift focus towards tangible results in export production to enhance Nepal's economic resilience and independence.

To attract business and investment, Nepal should establish a foreign exchange hedging market. Regardless of the current export figures, Nepal should prioritize substituting imports with domestic goods and services that offer fair prices for Nepal. Both the government and private sectors should leverage the productive age of the Nepali workforce before they age, creating meaningful job opportunities within the country. It's imperative to ensure that policies aimed at import substitution and export promotion are effectively implemented without delay, rather than allowing them to languish as mere documents.

Nepal boasts the largest voluntary absentee population globally, with many seeking opportunities abroad. Instead of abruptly halting its population from going abroad, Nepal should consider gradually reducing its working population overseas. This

approach can mitigate potential negative impacts and ensure a smoother transition for both the individuals seeking opportunities abroad and the country itself.

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