

CHAPTER I

INTRODUCTION

1.1 Background of the study

FDI is defined as an inflow of cash and non-cash in to the host country from foreign countries. An investment made by a company or individual in one country into business interests located in another country is considered as foreign direct investment. The World Bank (2012) defined FDI as the net inflows of investment to acquire a lasting management interest in an enterprise operating in an economy other than that of the investor. As indicated by the balance of payments, it is the total of equity capital, earnings reinvested, other long-term capital, and short-term capital. OECD (2002) defined FDI as is an integral part of an open and effective international economic system and a major catalyst to development. It taken as a source of capital formation of nation. It helps technological transfer, support human capital formation, enhances international trade integration, create the competitive environment and strengthen enterprise's development. According to Dunning (2009), foreign direct investment (FDI) boosts a recipient nation's gross capital formation, growth, industrial productivity, and competitiveness in addition to providing other benefits like technology transfer, managerial experience, better human resource quality, and increased investment. There are three -common motives of FDI: resource seeking, market seeking, and efficiency seeking (Dunning,1993). The industrialized nations transfer their resources to develop the resources of the developing countries. Foreign direct investment is a key driver for economic growth of any developing economy. Inflow of FDI depends on several factors- Government policies, openness to trade, size of market, labor cost, the currency exchange rate etc. Cockcroft and Riddell (1991) stressed that future capital flows are directly influenced by incentives such as expected rate of return; security of investment, tax regimes, investment code or guidelines, and the macroeconomic stability especially with regards to exchange rate and inflation. Exchange rate is one of the determinants of FDI (Gunes and Cambazoglu, 2016). Thus, exchange rate is an important factor for determining the level of FDI in receiving countries.

During the period 1971-1973, the Bretton woods system broke down under the pressure of enormous U.S. balance of payment deficit. In the face of huge deficit in 1971, and the shrinkage of the U.S. gold stock \$15 billion in the mid-1960s to \$10 billion in 1971, as foreign central banks exchange dollars for gold, the Nixon Administration ended gold sales in August 1971. This cut the Bretton woods tie of the dollars to gold. (Branson,2017). In practice, however, most country adopt a dual system: a fixed exchange rate for all official transaction and a market rate for private transaction (Dwivedi,2000). The most of the countries adopted a flexible exchange rate regime, which resulted in fluctuations in exchange rate. These fluctuations raised the uncertainty and the risk faced by foreign investors. Therefore, exchange rate volatility began to gain the attention of many scholars, and they started to examine the impact of exchange rate volatility on FDI.

In 1993, India officially moved towards a " market determined exchange rate" from a fixed peg to the US dollar. This was part of the liberalization and deregulation reforms of the early 1990's (Patnaik & Sengupta, 2021). India follows the managed floating exchange rate system. The Indian economy is performing well over the years and the prospects is expected to be better in the years to come, signaling the appreciation of Indian rupees (Koirala ,2018).

Chinese's economic reform and open-door policy have resulted in a fast increase in FDI inflows since 1979. A centralized system for regulating the currency rate existed in the late 1970's. The exchange rates regime developed into a dual system as the economy progressed through the reform process. The currency rate system was harmonized in 1985 and a narrow-band operated floating regime was used from 1986 to 1994. The Chinese currency system's fixed regime from 1994 to 2005, the Yuan was pegged at 8.28 Yuan per US dollar. China made the decision to index the value of its currency in 1994 to the United States Dollar (USD). Throughout the 1990's China was highly successful at the maintaining a currency peg against the US dollars (USD) using the government monopoly. At that time, China faced the criticism from global economies, who have blamed relying on an undervalued currency to promote exports. On July 21, 2005, China began to implement a managed floating exchange rate regime based on market supply and demand with reference to a basket of currencies (Hu, 2010).

The exchange rate system of Nepalese rupees has been pegged with Indian rupee, the exchange rate for which is officially determined. Dahal and Raju (2022), Nepal follows a dual exchange rate such that the Nepali rupee (NPR) is pegged with the Indian rupee (INR) but floats with the United States dollar (USD) and all other convertible currencies. Eventually, USD started floating daily only from February 12, 1993, after the full convertibility of the current account (NRB, 2018). Further, the Indian rupee (INR) and Nepali rupee (NPR) rate has remained the same since February 12, 1993. The fix exchange rate system in between Nepal and India can offer several benefits. For Nepal sides some benefits are stability and certainty in exchange rate, price stability, monetary stability, trade facilitation, more investment and attract tourism, economic integration and collaboration. It has some disadvantage for Nepal like: limited monetary policy autonomy, loss of monetary policy tool (adjustment through appreciation or depreciation of currency), disruptions and fluctuation in Indian currency direct hit to Nepalese economy, significant change in Indian economic condition or exchange rate impact on Nepalese economy that faced difficulties.

The relationship between FDI and currency exchange rates was the subject of several studies which tried to pinpoint a theoretical relationship between them. Froot and Stein (1991) predicted that a depreciation of the host nation's currency would have a favorable impact on FDI coming in by using an imperfect market approach. However, Jin and Zang's (2013) research disproved this theory, finding that since production and sales for market-oriented FDI are conducted in the host nation, a rise in the value of the host nation's currency boosts foreign investors' wealth through increased profits. Dixit and Pindyck (1994) examined the real option approach to foreign investment and contended that the uncertainty surrounding currency rates makes it more advantageous to retain the option of making no foreign investments. Foreign capital flows are affected by the highest expected return on investment, according to early neoclassical theories of capital flows. According to the standard option theory of capital flows, if a firm acquires with fixed costs, it is likely that firms will delay their investments when they face higher exchange rate volatility. Depending on how the home currency equivalent of expected future cash flows from the target firm is correlated with other assets in the acquiring firm's portfolio, high exchange rate volatility may have a positive or negative effect on

the investment decision (di Giovanni, 2005). According to trade theory of capital flows, FDI may be higher in countries experiencing uncertainty regarding the exchange rate because such uncertainty acts as a barrier to trade. Multinationals engage in FDI to avoid uncertainty affecting the price of their traded goods as the exchange rate fluctuates. Thus, multinationals increase their FDI to substitute for lower trade volumes in markets associated with higher volatility (Goldberg and Kolstad, 1995). The enterprises make when purchasing an asset that requires money created within the firm are influenced by changes in relative wealth, as per the imperfect capital market theory of capital flows. Therefore, depreciation in the host nation attracts FDI by raising the relative wealth of foreign investors and lowering the cost of capital investment (Cushman, 1985). The flexibility of the option value that a corporation has in postponing an investment decision in order to gather additional knowledge about the future is explained by real options theory of capital flows. A company must take into account the various forms of FDI and its timing in order to increase revenues from FDI activities. Therefore, it is unclear how a firm's decision to invest may be impacted by exchange rate volatility. If a company is risk adverse, it would typically postpone making an investment anytime exchange rate uncertainty rises. On the other hand, if the company is export-substituting, it will likely decide to boost its foreign direct investment (FDI) activity (Dixit and Pindyck, 1994).

Tom Jacob et al. (2021), the exchange rate, is the most significant element in an open economy. Since it has a final impact on macroeconomic variables such as FDI. International investors and policy makers pay close attention to a country's exchange rate before investing their funds in that country. They thought that increasing the exchange rate would give them a competitive edge in international trade and capital flows. Since 1990, the impact of exchange rates on foreign direct investment inflows has been extensively researched (Froot and Stein, 1991). Therefore, the focus on currency rates as FDI determinants combined with the structural break in FDI inflows into Nepal between 1990 and 2022. The study's findings support government initiatives to create an alluring center for international investment.

1.2 Statement of the Problem

Cushman (1985) used empirical tests to examine the annual level of FDI in the US and five other major industrialized nations. The conclusion that an increase in the real exchange rate would be beneficial for FDI. Jin and Zang (2013), pointed out that there is a significance positive impact of exchange rate on FDI in China. Zakari (2017), found that there is a positive relationship between FDI and exchange rate in Nigeria. But conversely, Cushman (1985); the theory of “relative production cost effect” currency depreciation will promote the inflow of FDI. Froot and Stein (1991) evaluated the influence of exchange rate level in the quantity of foreign direct investment inflow in the host country (USA) under the Wealth Position theory, and they concluded that the US dollar's depreciation had contributed to an increase in the volume of FDI coming in. This resulted from a drop in investment costs and an increase in investors' wealth. Campa (1993) put forward strong empirical evidence suggesting that volatility in the exchange rate harmed the US FDI. A similar conclusion was reached by Vita & Abbott (2008), Ullah et al. (2012), Azhar et al. (2015), Liu & Deseatnicov (2016), Jacob and Kattookaran (2019), Hniya et al. (2021), Moraghen et al. (2021), Abd-EI Atti et al. (2021) and Jacob et al. (2021). Among these studies there is lack of consistent finding in research about the relationship between the exchange rate and FDI.

China and India are the second and fifth largest emerging economies in the world respectively. As compare, Nepal is the small economy, which is situated as wedged between two economically powerful nations China and India. Nepal is suffering from the political instability, poverty, weak governance system and lack of sufficient resource. FDI is the new sources of resources and becoming the significant driver of economic growth. The high degree of uncertainty and volatility of exchange rate movements in host country (Nepal, India & China) disturbing the capital flow, is a main concern of policy makers and researcher to find the extent of the impact of these movement on the volume of trade and FDI inflows within nation. No academic research has documented this phenomenon in the case of Nepal. This paper attempts to bridge this literature gap by investigating the impact of exchange rate on FDI in Nepal.

Since the 1990s, when liberalization and globalization took place, the impact of exchange rates on foreign direct investment inflows has been extensively researched.

But no consistent result has been found from past study. The exchange rate is an important macroeconomic variable that facilitates the international trade of goods and services and the transfer of capital. Nepal follows a dual exchange rate system such that the Nepali currency is currently pegged with Indian currency but floats with the US dollar (USD) and other convertible currencies (Dahal & Raju, 2022). India has followed the system of market determined foreign exchange rate since 1993 by replacing the dual exchange rate system (Kaur and Dhaliwal, 2021). On July 21, 2005, China began to implement a managed floating exchange rate regime based on market supply and demand with reference to a basket of currencies (Hu, 2010). The study addresses the implications of the Nepalese currency being pegged to the Indian currency and the significant trade partnership between Nepal and India. The statement of the problem explores how these factors influence the exchange rate-FDI dynamics. Even though Nepal has a highly potential to foreign investment destination. Acknowledging the probability of high FDI inflow in Nepal, the study seeks to identify the conditions, drivers, and potential barriers that may impact the realization of this anticipated foreign investments. These nations are neighbors and significant investors in Nepal, the research aims to explore how the economic dynamics between Nepal, India, and China contribute to the patterns observed in exchange rates and FDI. The statement of the problem seeks to understand the unique challenges and opportunities arising from their close proximity.

The study aims to analyses the historical and current trends of exchange rates and FDI inflows in Nepal, India, and China. This involves understanding the patterns, fluctuations, and factors influencing the exchange rates and FDI in each country over a specific period. This research aims to investigate the impact of exchange rate fluctuations on Foreign Direct Investment (FDI) in Nepal, India, and China, with a specific focus on understanding the trends of exchange rates and FDI inflows in these neighboring nations. The study seeks to examine how changes in exchange rates influence the inflow of foreign direct investment in Nepal, India, and China. The primary question is to understand the nature and extent of this impact, considering the economic dynamics and relationships between these countries. Considering the vast economic differences, with China, India and Nepal, the study aims to investigate how these disparities impact the exchange rates, FDI trends, and overall economic relationships. These exchange rate volatilities also create the positive or negative affect

in different economy in different ways on FDI inflows. No research had been done until about the impact of exchange rate on FDI in Nepalese economy. Thus, there will be needed the comparative study of impact of exchange rate on FDI of Nepal, India and China respectively. The research aims to uncover the complexities and interdependencies that shape the investment landscape in these neighboring nations.

1.3 Objective of the Study

The main objective of this study is to examine the impact of exchange rate on foreign direct investment in Nepal, India and China. The other particular objectives of this are following:

- i) To analyze the trends in exchange rate and FDI in Nepal, India and China, during 1990-2022.
- ii) To examine the impact of exchange rate on FDI inflows in Nepal, India and China.

1.4 Significance of study

The exchange rate of home currency was frequently changed due to the high demand of currency of powerful economy. The relation between the exchange rate and FDI has been debated in the literature, because, the empirical study of past literature finding was different results in different country. Therefore, this study offers the precise empirical impact of exchange rate on FDI inflows into the economies of China, India, and Nepal. By studying all three countries, the research allows for a comparative analysis. Differences and similarities in the impact of exchange rates on FDI across these nations can highlight unique economic structures, policies, and challenges, providing valuable insights for policymakers.

This study results shows that the trends of exchange rate and FDI during the study periods. This trends lines helps to prediction of FDI inflows and also help to find the disturbance factors. The trend lines of exchange rate and FDI gives the new idea about the success or failure of existing policy. It also helps to find the on an average Nepalese, Indian and Chinese currency has devaluated as compare to other currency. It gives the

exact information of capacity of national currency on the basis of purchasing power of currency.

FDI is a significant source of financial inflows that support economic expansion and job creation in emerging nations. Successful attraction of FDI can contribute to the socio-economic development of Nepal. The study's insights can help design policies that not only attract investments but also ensure that the benefits of FDI positively impact the local economy, including job creation and infrastructure development.

Global integration of capital markets can contribute to the best practices in corporate governance. FDI is increased the country investment level, it increased the foreign exchange earnings. It's also a source of foreign currency through the equity capital and export of goods and services. FDI increase the exports, increase in saving and investment level in the host country. MNCs contributes to corporate tax revenues in the host country. It ultimately fulfills the resource gap in the least develop/ developing country. Furthermore, both China and India being among the world's largest economies, studying the impact of exchange rates on FDI from these nations provides insights into the strategies and decisions of major global investors. This information is crucial for Nepal to attract and retain foreign investments.

The study can contribute to the diplomatic and economic relations between Nepal, India, and China. Understanding how economic factors such as exchange rates influence FDI can foster collaboration and dialogue between these nations, leading to mutually beneficial policies and agreements.

This study helps to policy maker, businessman, researcher, as well as the general public in the country. The study's findings can inform policymakers in Nepal about the effectiveness of the current currency peg and exchange rate policies in attracting FDI. It can guide the formulation of policies that enhance the country's competitiveness and attractiveness for foreign investors. For businesses in Nepal, particularly those engaged in international trade, understanding the impact of exchange rates on FDI is crucial for effective risk management. This knowledge can help businesses anticipate potential challenges and adjust their strategies accordingly. No academic research has documented this phenomenon in the case of Nepal. This paper attempts to bridge this

literature gap by investigating the impact of exchange rate on FDI in Nepal, in which it helps to scholar and general public.

This study provides the scientific and empirical knowledge to the specific host country about the impact of exchange rate volatility on FDI. It is beneficial for policymakers to develop stable and sound macroeconomic policies that will prevent overvaluation of their national currency, which could impede FDI inflows to these chosen countries, and stabilize the foreign exchange rate, which is one of the key factors determining FDI inflows.

1.5 Limitation of study

This study will attempt to analysis the impact of foreign exchange on FDI in Nepal, India and China in last 33 years. This study has some limitation as: -

- i) This study is based mainly in the secondary data as provided by UNCTAD.
- ii) Only the data of FDI in flow in Nepal, India and China, since 1990.
- iii) This paper considers only one factor that can impact on FDI inflows in a country. It should be pointed out that there are other factors like, government policy, trade openness, marker size, labor cost, infrastructure etc. that also need to be investigated in order to for a conclusive conclusion to be drawn from the study.
- iv) This study is only concentration on limited economic indicator.

1.6 Outline of the study

The study is going to be divided into five chapters. The first chapter begins with introduction that consist of general background of the study, statement of the problems, objective of the study, significance of the study, limitation of the study and organization of the study. Chapter two, consists of reviews of literature, including the brief history of previous research works, which are related to impact of exchange rate / exchange rate volatility on FDI inflows in different countries. The third chapter, include the research methodology with its various sub - chapters as like research design, source of data, data collection procedures, organization management and processing of data, tools and technique of data analysis, specification of the model and time period of study. The fourth chapter includes the data analysis and discussion and finally the five chapter

present the summary of study, conclusion and recommendation with other residuals proportions of this study.

CHAPTER II

LITERATURE REVIEWS

2.1 Introduction

A literature review is crucial for providing a contextual understanding of the existing body of knowledge related to the impact of exchange rates on FDI. It helps to situate the current study within the broader academic discourse. Examining recent and relevant research allows the identification of trends and patterns in the relationship between exchange rates and FDI in the specific context of Nepal, India, and China. This aids in developing a comprehensive understanding of the subject. The literature review helps identify gaps in existing research. It allows researchers to pinpoint areas where there is a lack of sufficient exploration, thereby guiding the current study towards addressing these gaps. Literature provides the theoretical framework and conceptual basis for the research works.

Reviewing recent research helps in selecting and justifying the chosen research method. This guides the selection of relevant variables for the current study. The literature review allows the research to build on the foundations laid by previous studies. By acknowledging and incorporating established knowledge, the current study contributes to the cumulative growth of understanding in the field. This literature review serves as the intellectual backbone of the research, guiding the study's conceptualization, methodology, and interpretation of findings.

Many elements of exchange rate movement, currency volatility had been studied in the past, such as level of exchange rate volatility, expectations, and their impact on capital inflows. In the 1990s, some people tend to believe that the depreciation of international currency would improve FDI, currency depreciation means goods and services becomes cheaper, it attracts more international investor. But some scholar has the opposite opinion. Therefore, there is no common views about currency volatility and its impact on capital inflows. There is still some uncertainty, which led Pain and Welsum (2003) to conclude in their review of the research that different countries and investment kinds may have different reactions to exchange rate fluctuations in FDI

flows. Thus, on this theoretical base more and more literature reviews give the new idea about this phenomenon. This literature reviews mainly concentrate on how exchange rate volatility effects the performance of FDI in related host country.

Finally, literature review is the systematic process of reviewing the previous books, journals and studies with the objectives of understanding the research problems in details and finding out the appropriate methods of study. There are various national and international studies carried out to observe the impact of exchange rate on FDI inflows in different economies. In this part, various papers were reviewed in order to find out the research gap. Some of the studies carried out to study are as explained in below.

2.2 Literature Review

A) International Context

Jin and Zang (2013) investigated the impact of change in exchange rate on FDI evidence from China. The objective of this study is to test the impact of changes in exchange rate in the host country on FDI. This study primarily employs the OLS technique, ADF and Granger causality test to analysis the data. This study is based on the monthly data of foreign direct investment in China and the index of real effective exchange rate of RMB during January 1997 to September 2012. This study reveals that the appreciation of the RMB promotes FDI after the reforms in the exchange rate regime in 2005. In the long term the proper appreciation of RMB and a more flexible exchange rate regime will impact on China's currency and micro-control policies positively.

Khandare (2016) investigated the impact of exchange rate on FDI as comparative study of India & China. This study's primary goal is to investigate how exchange rates affect foreign direct investment in China and India. This study also aims to compare the empirical analysis of exchange rates and FDI between China and India, as well as to investigate the trends in these variables and their effects on FDI inflows into both countries. The study was made between 1991 and 2014. The data analysis used in this study mostly makes use of the correlation and regression techniques. According to this report, during the same period, FDI increased by 458.89 times in India whereas it increased by 29.43 times in China. Over the study period, there was 2.68 times drop in the value of Indian rupees in US dollars and 1.15 times decrease in the value of China

yuan in US dollars, according to the exchange rate. It is discovered that FDI and the Indian currency rate positively correlate. The exchange rate and foreign direct investment have a negative link for China. This study notes that there is a strong correlation between FDI and the exchange rate in India. Therefore, while it is advised that China should follow India's lead and adopt a fluctuating exchange rate policy, China actually implemented a fixed and floating exchange rate system during the study period.

Liu and Deseatnicov (2016) examined the exchange rate and Chinese outward FDI. This article's primary goal is to statistically investigate whether the outward foreign direct investment (OFDI) operations of Chinese multinational corporations became susceptible to fluctuations in exchange rates. Chinese outward foreign direct investment operations in 119 countries between 2003 and 2013 are included in this panel dataset analysis. To answer this topic, this work mainly uses the system generalized method of moments (SYS-GMM) and feasible generalized least squares (FGLS) models. According to this study, China's outbound FDI flows are stimulated by both higher exchange rate volatility and predicted depreciation, whereas the country's appreciation of the Renminbi has a negative effect on Chinese outflows.

Jacob and Kattookaran (2019) investigated the impact of exchange rate volatility on FDI, which is becoming an important component of investment in India in recent years and the future. The primary goal of this research is to examine the relationship between exchange rate and FDI in India. Examining the effect of currency rate fluctuation on foreign direct investment inflows into India is the specific objective. The ARDL model is predominantly used in this study's data analysis. Based on monthly FDI and exchange rate data from April 1995 to March 2018, the study was conducted. The empirical results showed that exchange rate volatility significantly reduces FDI flow into India over the short and long terms. In other words, more FDI enters the host nation when its currency depreciates.

Belinda and Mandigma (2019) investigated the impact of real exchange rate on FDI in four emerging markets of southeast Asia. This study looked into how the real exchange rate affected foreign direct investment into four emerging markets in Southeast Asia,

known as the ASEAN-4 (which includes Thailand, Malaysia, Indonesia, the Philippines, and Malaysia). Testing for serial correlation functional form misspecification and non-normality of the variable measuring the real exchange rate (RER) and the foreign direct investment inflows into the ASEAN-4 is the primary goal of this research. Examining the long-term co-integration relationship between RER and FDI inflows within the ARDL paradigm is the second goal. The third goal is to use the Granger causality test inside the error correction model (ECM) to investigate the causal relationship between RER and FDI inflows. For each of the four ASEAN nations, the Auto Regressive Distributed Lag (ARDL) model was utilized to examine the possibility of a long-term co-integration relationship between adjusted FDI and RER. In addition, the Granger Causality test is used to determine which way the two variables—AFDI and RER—are causally related. The study's foundation is the inward flow of foreign direct investment (FDI) from 1970 to 2017, for which statistics were obtained from the UNCTAD database. Another annual dataset covering the same time period was obtained from the World Development Indicator and contained the GDP, whole sale price index in the USA, official exchange rate, and consumer price index. All four of the ASEAN economies show a long-term correlation between AFDI and RER, according to this analysis. In Indonesia, the Philippines, and Thailand, there is a short-term, unidirectional causal relationship between RER and AFDI. But only in Thailand does the long-term impact of RER on AFDI become apparent.

Qamruzzaman et al. (2019), investigated the existence of asymmetric pattern of relationships between exchange rate and FDI in Bangladesh. This study aims to explore the patterns of correlations, whether symmetric or asymmetric, between foreign direct investment (FDI) and exchange rates. The Auto Regressive Distributed Lag (ARDL) model and the nonlinear ARDL model are the main tools used in this work to examine the data. The quarterly data for the years 1974 through 2016 served as the study's foundation. The information was gathered from a number of sources, including the Ministry of Finance's Bangladesh Economics Reviews, the Bangladesh Bureau of Statistics' Statistical Yearbook, and Bangladesh Bank's Annual Report. The results of this study show that there is an unbalanced relationship between FDI and exchange rates. In each scenario, an asymmetric relationship verifies the influence of one variable on another. This suggests that FDI is attracted to actual host currency depreciation (the

taka) vs the USD. The coefficients of the error correction term support long-run causation for directional causality, and they also reveal bidirectional causality between FDI and exchange rate.

Chowdhury and Anuradha (2021) investigated the relationship of FDI inflows and exchange rate in the context of India. The objectives of this study were to know the relationship of FDI and currency graphically for a span of 25 years, to measure the impact of FDI inflows on currency and the effect of currency on FDI inflows for 25 years and to discuss about probable policy measures for Indian economy. This study employs Augmented dicky fuller (ADF) test and Granger causality test to analyze the data. This experiment is conducted on twenty-five years, time series data from 1991-2016 extracted from secondary data source. The finding of research shows that there is no causal relationship between FDI and currency in the long run. There is no clear mention of exchange rate being the contributor for the determination of FDI flow in developing economies. It's observed that market size, growth, trade openness, labor cost and productivity, infrastructure, and tax are playing the major role in determining the FDI flow in an economy.

Jacob et al. (2021) investigated the empirical impact of exchange rate volatility on FDI in China. This study's goals are to look at the trends in both FDI and exchange rates, analyze the relationship between the two, and find out how exchange rate volatility affects FDI in China. This study primarily employs Auto Regressive Distributed Lag (ARDL) model to analyze the data. This research is based on secondary data gathered between 1990 to 2020. The FDI and exchange rate data were collected from world bank database. The findings reveal that the exchange rate has a statistically significant negative influence on FDI. In short, the currency volatility of the host country leads to decrease the FDI flows into the that country.

Hniya et al. (2021) investigated the impact of real exchange rate volatility on FDI in Tunisia. The objective of this study is to investigate the impact of real effective exchange rate (REER) and its volatility on Tunisia FDI inflows for the period from 1980 to 2018. This study primarily employs Auto Regressive Distributed Lag (ARDL)

model to analyze the data. This study reveals that an increase in exchange rate volatility tends to lower FDI inflows over a long-term horizon. While in the short term, the relationship between REER and FDI is positive, while volatility retains its negative long-term effect.

Moraghen et al. (2021) investigated the impact of exchange rate and exchange rate volatility on FDI inflows for Mauritius. The objective of this study is to examine the impact of exchange rate and exchange rate volatility on FDI inflows. This study primarily employs a vector error correction model (VECM), which is a dynamic time series analysis use for data analysis. Time series data that are gathered annually from 1976 to 2018 are used in the modeling method. This study will add to the body of knowledge about the factors influencing foreign direct investment (FDI) in Mauritius, which has mostly highlighted the importance of currency rates and their volatility. The findings of this study are exchange rate volatility was found to negatively impact on FDI, while depreciating real exchange rate attracts foreign investors. The openness level, wages, literacy level, and tax are also observed to be ingredient of FDI in both the long and short term. Moreover, the analysis validates the dynamic nature of FDI in Mauritius.

Abd-EI Atti et al. (2021) investigated the impact of relative exchange rate volatility and other multidimensional determinants on FDI in Egypt. The goal of this study is to improve knowledge of the effects of multidimensional variables on FDI inflows to Egypt from 42 source countries, as well as the relative real exchange rate volatility between the home and host countries. This study uses data gathered for 42 source countries between 2005 and 2019 to apply both the augmented FDI gravity model and the foundation FDI gravity model. This study shows that FDI into Egypt is negatively impacted by relative exchange rate volatility. Moreover, research has shown that the size of the home and host countries' markets positively influences FDI into Egypt. For inward FDI to Egypt, it is discovered that geographic distance, bilateral trade, relative cost of borrowing, relative labor productivity, and relative corruption are statistically significant.

Akinlo and Onatunji (2021) investigated the exchange rate volatility and FDI in selected west African countries (ECOWAS-Economic community of west African state). The objective of this study is to examines the nexus of relationship (effect / causality) between exchange rate volatility and FDI flows for selected ECOWAS countries. The ARDL model and the Toda Yamamoto causality methodology are the main methods used in this study to examine the data. Time series data that are gathered annually from 1986 to 2017 are used in the modeling method. The fact that every one of the chosen nations has transitioned from a fixed system to a flexible exchange rate regime informs the choice of the time range. The outcome demonstrates that, while it is considerable in Ghana, Sierra Leone, and Nigeria alone, the projected coefficient of nominal exchange rate volatility is negative in all of the countries that were chosen. On the other hand, as would be predicted, the impact of real exchange rate fluctuation is negatively significant in Sierra Leone, Nigeria, Togo, and Cote d'Ivoire. In Ghana and the Gambia, the effect is statistically insignificant but positive.

Huong et al. (2021) investigated the exchange rate volatility and FDI response during the financial crisis period in Vietnam. The objective of this study is to examine the empirical impact of real effective exchange rate volatility on foreign direct investment in Vietnam. This study employs Auto Regressive Distributed Lag (ARDL) model to analyze the data. Quarterly frequency statistics covering the period from 2004: Q1 to 2019: Q2 comprise the research data. The real effective exchange rate (REER) information for 143 trading partners was gathered from Bruegel's (European) statistics. The volatility of the exchange rate was calculated using these statistics. From the International Financial Statistics, FDI figures were gathered. The study's conclusions show that, with a three-period lag, foreign direct investment (FDI) in Vietnam reacts favorably and strongly to exchange rate volatility. Furthermore, there has been a minor decline in foreign direct investment inflows into Vietnam as a result of the 2008 global financial crisis, which had a two-period lag.

Leasiwal et al. (2022) investigated the impact of macroeconomic indicators: economic growth, inflation, interest rates, and exchange rate on the condition of FDI in Indonesia. The objective of this study is for knowing influence growth economy, inflation, interest

rate, and value rate to FDI investment in Indonesia. This study primarily employs Multiple Regression Analysis to analyze the data. This study using the secondary data collected from the World bank publication and bank of Indonesia publication in the form of 2000-2019 annual data. The finding of research shows that economic growth and exchange rate have an effect positive but no significance to FDI investment, while, inflation and interest rate have a negative and significant effect on FDI investment in Indonesia. Ethnic group flower is the most influential factor strong to FDI investment in Indonesia.

Adewale and Comfort (2022) investigated the nexus between exchange rate fluctuation and FDI in Nigeria. This study aims to investigate the relationship between foreign direct investment in Nigeria and fluctuations in exchange rates. The data in this study are analyzed using the ARDL model. The data sample was chosen to encompass exchange rate volatility and foreign direct investment in Nigeria between 1986 and 2020. The results showed that there was a negative correlation between foreign direct investment and the exchange rate in Nigeria. Additionally, every lagged exchange rate value was statistically significant at the 5% level of significance, indicating the significance of the exchange rate for foreign direct investment inflows into Nigeria. Based on the study's empirical findings, it can be concluded that foreign direct investment in Nigeria was rise in response to an increase in exchange rate fluctuations. Furthermore, trade openness, inflation, interest rates, and exchange rates are the main factors influencing foreign direct investment into Nigeria. It implies that changes to the interest rate, inflation, or exchange rate have an impact on the flow of foreign direct investment into Nigeria. This report also suggested that steps be taken to fix the dollar to naira exchange rate further in order to lower the risk of foreign exchange failure for businesses that already have foreign investments in Nigeria. In order to attract more foreign direct investment into Nigeria, the government should implement an interest rate strategy through the Central Bank of Nigeria that will reduce the cost of borrowing money. Finally, in order to draw foreign direct investment into Nigeria, the government should put in place fiscal and monetary policies targeted at stabilizing the country's inflation rate.

B) National Context

Bista (2005) investigated the FDI in Nepal with respect to GDP growth and trade export in India and third world countries. The objective of this study is to find out the relationship between FDI and economic growth and FDI and export trade specifying the export trade to India and to the third world countries. This study employs to simple regression model, descriptive and analytical methodology is used to analyze the data. The secondary, time series data of FDI, real GDP and export trade were collected from 1990 to 2004. The data are collected from the Department of Industry/HMG, Economic Survey, Ministry of Finance/HMG, Trade statistics, Trade Promotion Center/HMG and FNCCI etc. The empirical result of that study was the contribution of FDI to real GDP and export trade is positive with significant change value. For increasing the contribution of FDI to real GDP and export trade, the FDI size should be made significantly larger. This is possible when Nepal was having effective FDI policy, good Investment climate and political stability along with liberal India, Nepal and China and Nepal Trade and Transit Treaty. Moreover, recommendation to the policy maker and executor should consider it and also answer that why FDI inflow come in Nepal before formulating the policy.

Adhikary (2015) investigated the dynamic effect of FDI, trade openness, capital formation and human capital formation on the economic growth rate in the least developed economic country of Nepal. The objective of this study is to find the linkage between FDI, trade openness, capital formation and human capital formation on the economic growth in Nepal. This study employs to Vector Error Correction (VEC) model and Granger causality test to analyze the data. The study uses annual data over the period 1985-2012 which covers Nepal's long economic reform era. This study shows that there is a long-term equilibrium relationship between the variables. Additionally, trade liberalization and foreign direct investment have a positive dynamic impact on Nepal's GDP per capita growth rate. According to the study, Nepal should implement a more liberalized trade policy in order to draw in international investment and maintain a steady rate of economic growth. In order to reap the benefits of foreign technologies spilling over into other areas, there needs to be more investment made in human capital.

Bista (2017) investigated the determinants, structure and trends of FDI with respect to economic liberalization in Nepal. This objective of this study is to examine the relationship between FDI and GDP along with the impact of FDI determinants on FDI inflows in Nepal. This study employs a multiple regression model based on the Cobb-Douglas production function. FDI inflow determinants consist of many heterogeneous variables. Among these, there are major four variables such as FDI stock, GDP, policy environment (liberalization and privatization), and security motivated FDI firms are used in these studies. The secondary data from 1982 to 2007 are collected from World Bank Investment Report and Department of Industry in Nepal. The results indicate a positive relationship between GDP and FDI. Furthermore, liberalization and privatization policies are positive but insecurity is disturbing. If there are two scenarios: (1) no policy, no history of FDI and no good economy, but there is good security; (2) good policy environment, history of FDI, and economy, but no good security. In the first scenario, there is better performance of FDI. In addition, liberalization and privatization policy increase 8 and 3.4 times more, but insecurity discourages 3.5 million (\$). FDI inflow (t) depends more on FDI ($t-1$), policy environment, and security along with economic performance (GDP). Furthermore, physical and policy environment which is still poor and under constraint for industrial expansion and trading, should be properly and environmentally-friendly improved.

Phuyal and Sunuwar (2018) investigated the sectoral analysis of FDI on economic growth of Nepal. This study aims to investigate the impact of foreign direct investment (FDI) on Nepal's economic growth across many sectors, including agriculture and forestry, construction, energy, manufacturing, mining, services, and tourism. Industries are categorized under the Industrial Enterprises Act (1992) into the following categories: (i) Agro- and Forest-based Industries; (ii) Construction Industries; (iii) Energy-based Industries; (iv) Manufacturing Industries; (v) Mineral Industries; (vi) Service Industries; and (vii) Tourism Industries. All of these industries are included in this study. The data in this study are analyzed using a linear regression analysis. Annual data on GDP, ER, IR, and FDI flow were used in this analysis for the fiscal years 1993/94 to 2014/15. As part of its sample, this study also includes sector-specific GDP and FDI data from fiscal years 1993/94 to 2014/15. According to the empirical research

results of the inferential analysis, FDI in the tourist, agricultural, and industry sectors is expected to have a considerable and beneficial impact on GDP throughout the specified period of time. The main finding is that some significant industrial FDI and GDP have a positive association. When GDP was taken into account as the dependent variable, FDI influx into the manufacturing, service, and tourist sectors revealed a strong correlation. The outcome demonstrates that these three industries are essential to Nepal's economic expansion. Even though there aren't many investments in the mining and construction industries, these are undoubtedly some of the most lucrative industries because there are many opportunities for infrastructure development—Nepal still lags behind other countries in this regard—and because there are plenty of resources in Nepal that are just waiting to be discovered. In the case of Nepal, FDI has not yet made a significant contribution to economic growth. Government and policy makers should create a business climate that makes foreign investors feel that their capital is safe. The countries are lunch the few incentive packages which is the fruits of capital investment to reach market, like, low tax rates or other tax incentives, protection of private property rights, access to loans and funding, and good infrastructure.

Essayad et al. (2018) investigated the remittances and real exchange rate in south Asian nation as the case of Nepal. The objectives of this paper attempts to investigate the impact of economic variables including remittances on the foreign exchange rate of the Nepalese rupee. This study employs autoregressive distributed lag (ARDL) and augmented-dickey-fuller (ADF) unit root tests to analyze the data. This study is based on the annual data series of all the data from 1993 to 2016, except for the U.S. treasury bill which is used to measure the world interest rate (WIR). The data are from the world development indicators (WDI) compiled by the World Bank. The data for the U.S. treasury bill is from the St. Louis Federal Reserved database. The empirical results show that there is evidence that increasing remittance inflows leads to currency depreciation in the short-run and currency appreciation in the in the long-run.

Pokharel and Pokharel (2019) investigated the impact of FDI on economic growth of Nepal. This study aims to examine how foreign direct investment (FDI) affects Nepal's economic growth. The Granger causality test and a multiple regression model are used in this work to assess the data sets. The study's time frame is from 2008/09 to 2017/18.

annual data from the Nepal Rastra Bank (NRB) and the government of Nepal's economic survey. The results show that there is a positive and substantial association between GDP, FDI, and gross fix capital formation, indicating that the model is overall significant. There was no causal relationship between the variables, according to the Granger causality test. In order for Nepal to attract more foreign direct investment, the empirical findings of this paper suggest that hard work be put into resolving issues with government involvement in business, the country's relatively closed economy, corruption, weak public institutions, a negative public image, and political instability

Neupane (2020) investigated the topics of FDI in Nepal which is based on the FDI in various sectors in terms of the number of projects, employment created, and the amount invested. This study aims to investigate the relationship between GDP and FDI. The descriptive research design is used in this study to analyze the data sets. The secondary data that served as the basis for this investigation were also desk-analyzed. The data gathered from the Ministry of Industry about foreign direct investment from fiscal year 2066/067 to 2075/076 served as the foundation for this analytical analysis. The article's conclusion is that foreign direct investment (FDI) has little effect on capital formation or employment in the Nepalese economy, and as a result, it contributes less to GDP. It also showed that FDI includes new technology, financial resources, management strategies, and market access for the manufacturing and transportation of goods and services. The descriptive research design is used in this study to analyze the data sets. The data sets in this study are analyzed using multiple regression analysis.

Kharel (2020) investigated the FDI in Nepal as a prospective of its impact on Employment. This study's primary goal is to examine Nepal's overall foreign investment climate. The study's specific goal is to assess how FDI has grown and changed over time, as well as how it affects employment. The descriptive research design is used in this study to analyze the data sets. Multiple regression analysis is used in this study to examine the data within the model. The time frame covered by the study is 2000/01 to 2018/19. This analysis concluded that although the government offers attractive incentives and has liberal policies, the overall image of FDI is not positive. The structure and trends of foreign direct investment indicate that the liberal policy environment is no longer sufficient to draw in international capital. Additionally, the

outcome demonstrates a strong correlation between FDI changes and employment. FDI is a variable that contributes 16% to employment. According to the results of a multiple regression study, employment and foreign direct investment, FDI significantly predicts employment.

Chaudhari et al. (2020) investigated the impact of covid-19 pandemic on FDI in Nepal from south Asian perspectives. The purpose of this research is to determine how COVID-19 affects FDI inflows and other obstacles to FDI commitment in Nepal. The descriptive research design is used in this study to analyze the data sets. This research is predicated upon secondary data. Given the country's rapid economic development, the government gave priority to infrastructure, IT, energy, tourism, agriculture, and other sectors. This makes foreign direct investment possible. The Nepalese government is taking donor commitments for foreign investment and putting them into action. The study's conclusion is that the COVID-19 outbreak has, as anticipated, resulted in a decrease in FDI commitment money. Pandemics are more than just investment commitment hurdles.

Thapa (2022) investigated the Impact of FDI on employment generation in Nepalese economy. The study's goals are to examine how foreign direct investment (FDI) has affected Nepal's industrial sector's ability to create jobs between 1991 and 2020. OLS, Unit Root, integration, Vector Auto-Regression model, and Granger Causality test are used in this work to examine the data sets. Secondary data form the basis of the investigation. For every variable in the analysis, annual time series data from the Ministry of Industry, Ministry of Statistics, and Government of Nepal are used. The data spans the years 1990 to 2020. The study's conclusions show that there is no sustained correlation between foreign direct investment (FDI) and the creation of jobs in Nepal since FDI is extremely small and variable in the country.

Chettri et al. (2022) investigated the FDI and stock market development in Nepal. The study's goal is to look into how FDI has affected the growth of Nepal's stock market. The long-term relationship in this study is determined using the Johansen Cointegration Approach, and the causal relationships between the variables are examined using the

VEC Granger causality test. Annual time-series data for the years 1996–2020 were included in the sample. Using the Johansen cointegration test, the long-term link between FDI, stock market development, and exchange rate was investigated in the presence of three additional macroeconomic variables: inflation rate, interest rate, and banking sector development. According to the empirical findings, FDI has a long-term, beneficial impact on the development of the stock market, but a short-term, negative one. In the medium term, there is a negligible positive correlation between FDI and currency rates. The exchange rate's statically negative coefficient suggests that, over time, the growth of the stock market is stimulated by the home currency's appreciation. The positive relationship of exchange rate with FDI indicates that depreciation of the home currency encourages the foreign investors to invest in Nepal. This depreciation of currency of host country lowers the production cost which eventually minimizes the relative cost of capital and is known as a relative wage channel. The result indicates that the relative wage channel allows investors' increased value in the home country in the short-run, however the relationship is not observed to be significant.

Dahal and Raju (2022) investigated the exchange rate regime of Nepal with respect to determinants and inter-dynamic relationship with macroeconomic fundamentals. The objective of this study is, to identify major macroeconomic determinants of the USD-NPR exchange rate, to analyze the long-run relationship between USDINR and USD-NPR exchange rate, and to estimate inter-dynamics among major economic variables and draw some policy implications. This study employs the OLS approach and Engle-Granger cointegration approach to analyzes the data. Data is obtained from NRB quarterly financial highlights from 2004–05 to 2019–20 based on the Nepali calendar. However, the USD-INR nominal exchange rate is taken from the RBI Handbook of Statistics. Further, data of Nepal Stock Exchange (NEPSE) Index data for 2004 and 2005 were taken from the Securities Exchange Board of Nepal (SEBON) as these data were not included in the NRB quarterly report. The finding shows that causal relationship through OLS regression demonstrates that though diminutive, interest rate, inflation rate, and NEPSE index are significant variables that determine exchange rate in the long run. This explains that Nepal's exchange rate long run is determined by India's exchange rate than its own fundamentals.

This study focusses the critical reviews of the relationship of each of the macroeconomics variables FDI and exchange rate. The literature reviews include as much related and current material as feasible, as well as information about the developing and developed world's potential international and national contexts. A matrix of literature reviews is as follows:

Table No. 1 Literature reviews

S. No.	Author and Title of Study	Objective	Variables	Methodology	Results
D)	International Context:				
A	Exchange rate and its impact on FDI.				
1	Barnor (2011). Effects of exchange rate regimes on FDI inflows in Ghana.	The impact of Ghana's currency rate regime on foreign direct investment inflows was examined.	FDI is dependent variables. where, independent variables are: GDP-per capita /Population (market size and potential), trade openness, investment climate,	OLS-ordinary least squares and the cointegration technique are used for analysis of this phenomenon.	Exchange rate regime has no discernible effect on Ghana's FDI. Exchange rate reserves have little bearing on FDI inflows into Ghana, and efforts by policymakers to stabilize the currency may not always result in appreciable FDI inflows.

			political factor (democratic and stable economies), exchange rate regime, policy distortion.		
2	Jin and Zang (2013). Impact of change in exchange rate on FDI evidence from China.	To test the impact of changes in exchange rate on FDI in China.	Logarithm of FDI, dependent variables. the logarithm of the real effective exchange rate of RMB, is independent variables.	OLS, ADF-test, Engle-Granger causality test.	The exchange rate regime revisions in 2005, the appreciation of the RMB encourages FDI. In the long term the proper appreciation of RMB and a more flexible exchange rate regime will impact on China's currency and micro-control policies positively.
3	Bilawal et al. a (2014). Impact of exchange rate on FDI in Pakistan.	The main purpose of conducting this research is to investigate the impact of exchange rate	FDI-are the dependent variables. EXR-are the independent variables.	Correlation and regression analysis.	The exchange rate has strong positive correlation with FDI. The regression analysis showed that exchange rate has strong effect of

		on FDI in Pakistan. (The specific aim of this research was to investigate the effect of exchange rate on FDI)			69.9% on FDI in Pakistan.
4	Khandare (2016). Impact of exchange rate on FDI – A comparative study of India & China.	This study's primary goal is to investigate how exchange rates affect foreign direct investment in China and India. This study's other specific goal is to: a) Examine trends in FDI and exchange rates in China and India. b) To investigate how exchange rates affect China's and India's FDI inflows.	Ln (FDI) -is the dependent variables, ln (EXR)- is the independent variables,	Correlation and regression analysis.	During the same period, China's FDI increased by 29.43 times in absolute terms, whereas India's FDI increased by 458.89 times. Over the study period, there was 2.68 times drop in the value of Indian rupees in US dollars and 1.15 times decrease in the value of China yuan in US dollars, according to the exchange rate. It is discovered that FDI and the Indian currency rate positively correlate. The exchange rate and foreign direct investment have a

		c) To contrast China's and India's FDI with empirical analyses of the exchange rate.			negative link for China. Thus, it is advised that China follow India's example of fluctuating exchange rates.
5	Chowdhury and Anuradha (2021). Relationship of FDI inflows and exchange rate in the context of India: A two-way analysis approach.	This paper focuses on the following objectives: a) To know the relationship of FDI and currency graphically for a span of 25 years. b) To measure the impact of FDI inflows on currency and the effect of currency on FDI inflows for 25 years. c) To discuss about probable policy measures for Indian economy.	FDI – is the dependent variables. Currency – is the dependent variable.	Granger Causality Test. ADF (Augmented dicky fuller test) for stationary test.	There is no causal relationship between FDI and currency in the long run. There is no clear mention of exchange rate being the contributor for the determination of FDI flow in developing economies. Its observed that market size, growth, trade openness, labor cost and productivity, infrastructure, and tax are playing the major role in determining the FDI flow in an economy.
B	Volatility of exchange rate and its impacts				

6	<p>Vita and Abbott (2008). Do exchange rates have any impact upon the UK inward FDI?</p>	<p>Impact of the level and volatility of exchange rate on FDI.</p>	<p>FDI is dependent variables. Independent variables are exchange rate, exchange rate volatility, trade openness, and inflation.</p>	<p>GMM- One step generalized method s of movements . Panel regression model.</p>	<p>Strong evidence of a negative and significance relationship between real exchange rate volatility and FDI inflows. The real exchange rate is found to have a statistically insignificant effect on FDI after controlling for endogeneity of the regressor.</p>
7	<p>Ullah et al. (2012). Impact of exchange rate volatility on FDI: A case study of Pakistan.</p>	<p>To investigate the relationship of FDI with exchange rate and exchange rate volatility.</p>	<p>RFDI is dependent variables. Independent variables are real exchange rate, exchange rate volatility, and inflation, and trade openness.</p>	<p>Time series analysis/Unit root test/ Volatility analysis/ cointegration technique and Granger causality analysis.</p>	<p>FDI is positively associated with rupee depreciated and exchange rate volatility deters FDI.</p>

8	<p>Elly and Ojung'a (2013). The effect of exchange rate volatility on FDI in Kenya.</p>	<p>This study seeks to examine the effect of exchange rate volatility on FDI in Kenya.</p>	<p>FDI – is the dependent variables. EXR – is the independent variable.</p>	<p>Correlation analysis.</p>	<p>There are weak positive relationships between two variables and hence need to control the exchange rate fluctuation in order to increase the FDI inflows.</p>
9	<p>Azhar et al. (2015). Effect of exchange rate volatility on FDI in SAARC countries.</p>	<p>The major concern of this study paper is to analyze the effect of exchange rate volatility on FDI in SAARC countries (Pakistan, India and Sri Lanka) over the period of 1981 to 2013 and to study the relationship between exchange rate fluctuations and FDI.</p>	<p>$FDI_t =$ dependent variable. Independent variables are: real exchange rate, the volatility in exchange rate, trade openness, foreign direct investment stock.</p>	<p>GMM (Generalized method of moments) / Unit root test used.</p>	<p>The result shows that there is a negative relationship between exchange rate volatility and FDI for these countries.</p>

10	Liu and Deseatnicov (2016). Exchange rate and Chinese outward FDI.	The main objective of this article is to examine statistically whether Chinese multinational companies OFDI activities became sensitive to exchange rate fluctuation.	FDI- dependent variable. Explanatory variables, - Nominal ER, Other control variables are: GDP growth, Wage, real interest rate in China, Openness, natural resources and political environment.	FGLS and SYS-GMM model.	Higher ER volatility and projected depreciation both stimulate China's outbound FDI flows, but the appreciation of the Renminbi has a negative effect on Chinese outflows.
11	Zakari (2017). The impact of exchange rate fluctuation on FDI in Nigeria.	This study aims to examine the impact of exchange rate on FDI and the contribution of FDI to GDP in Nigeria.	FDI – is the dependent variables. EXR – is the independent variable and	Correlation and Regression analysis.	There is a positive relationship between FDI and exchange rate. Furthermore, there is a weak positive relationship between FDI and GDP in Nigeria. The study concludes that

			GDP is the independent variable.		exchange rate, FDI and GDP are positively correlated.
12	Jacob and Kattookaran (2019). Impact of exchange rate volatility on FDI in India: An empirical analysis.	i) To investigate the connection between the Indian rupee and FDI. ii) To look at how exchange rate fluctuations affect FDI inflows into India.	FDI – is the dependent variables, NEER-nominal effective exchange rate,	ARDL Model.	Empirical results showed that exchange rate volatility significantly reduces FDI flow into India over the short and long terms. In other words, more FDI enters the host nation when its currency depreciates.
13	Belinda and Mandigma (2019). Impact of real exchange rate on FDI in four emerging markets of southeast Asia. (The ASEAN-4, including Indonesia, Malaysia,	This study investigated the impact of real exchange rate on the inward FDI. The specific objective of this study is: i) To test for serial correlation functional form	AFDI-adjusted FDI is dependent variables. RER is independent variables.	Auto Regressive Distributed Lag (ARDL) Model. Granger Causality Test.	All four of the ASEAN economies show a long-term correlation between AFDI and RER according to this study. In Indonesia, the Philippines, and Thailand, there is a short-term, unidirectional causal relationship between RER and AFDI. But

	Philippines and Thailand).	misspecification and non-normality of the variable measuring the real exchange rate and the FDI inflows of the ASEAN-4. ii)To test for long run co-integration relationship between RER and FDI inflows. iii)To examine the causal relationship between RER and FDI inflows.			only in Thailand does the long-term impact of RER on AFDI become apparent.
14	Qamruzzaman, et al. (2019). Does asymmetric relation exist between exchange rate and FDI in Bangladesh?	To look at any patterns of symmetric or asymmetric links between FDI and currency rates.	FDI-dependent variables, EXR-independent variable, money supply-	Auto Regressive Distributed Lag (ARDL) Model and nonlinear ARDL Model.	Asymmetric relationship between exchange rate and FDI. This suggests that FDI is attracted to actual host currency depreciation (the taka) vs the USD.

			independent variable, real government expenditure-independent variable.		
15	Hniya et al. (2021). The impact of real exchange rate volatility on FDI in Tunisia.	To determine the impact of REER (real effective exchange rate) and its volatility on Tunisia FDI inflows.	Independent variables, GDP per capita growth, population growth, trade openness, inflation, information, real effective exchange rate, volatility of the REER, the financial development.	Auto Regressive Distributed Lag (ARDL) Model.	An increase in exchange rate volatility tends to lower FDI inflows over a long-term horizon. While in the short term, the relationship between REER and FDI is positive, while volatility retains its negative long-term effect.
16	Moraghen et al. (2021). Impact of exchange rate and exchange	This study will add to the body of knowledge about the factors influencing FDI	FDI is dependent variable. Independent variables are	Dynamic time series analysis, namely a VECM	Exchange rate volatility was found to negatively impact on FDI, while depreciating real

	<p>rate volatility on FDI inflows for Mauritius: A dynamic time series approach.</p>	<p>in Mauritius, which has mostly highlighted the importance of currency rates and their volatility.</p>	<p>the real exchange rate, the volatility of real variable, average earning (labor cost), human capital, openness of the economy, taxation.</p>	<p>(vector error correction model).</p>	<p>exchange rate attracts foreign investors. The openness level, wages, literacy level, and tax are also observed to be ingredient of FDI in both the long and short term. Moreover, the analysis validates the dynamic nature of FDI in Mauritius.</p>
17	<p>Abd-El Atti et al. (2021). The impact of relative exchange rate volatility and other multidimensional determinants on FDI in Egypt.</p>	<p>The general goal of this research is to improve knowledge of the effects of multidimensional variables on FDI inflows to Egypt from 42 source countries, as well as the influence of relatives' real EXV between the home and</p>	<p>Real exchange rate, real exchange rate volatility. gross domestic product, existing bilateral trade, cultural distance, relative labor</p>	<p>FDI gravity model (plus augmented FDI gravity model) / GMM estimation approach.</p>	<p>Inward FDI into Egypt is adversely affected by the relative volatility of exchange rates. Additionally, research has shown that the size of the home and host countries' markets positively influences FDI into Egypt. For inward FDI to Egypt, it is discovered that geographic distance, bilateral trade, relative cost of</p>

		host countries on inward FDI.	productivity , corruption, geographical distance, cultural distance.		borrowing, relative labor productivity, and relative corruption are statistically significant.
18	Jacob et al. (2021). Impact of exchange rate volatility on FDI in China: An Empirical Analysis.	This study aims i) To investigate the patterns of FDI and exchange rates in China. ii) To investigate the connection between China's FDI and exchange rate. iii) To look into how exchange rate fluctuations affect foreign direct investment in China.	FDI is dependent variables. Exchange rate is independent variables.	ARDL-Model. ADF -Test.	The findings reveal that the exchange rate has a statistically significant negative influence on FDI. In short, the currency volatility of the host country leads to decrease the FDI flows into the that country.
19	Akinlo and Onatunji (2021). Exchange rate	This study looks at the causal relationship (effect) between	FDI- is the total inflows of FDI as a percentage	ARDL Model.	The outcome demonstrates that, while it is considerable in

	<p>volatility and FDI in selected west African countries (ECOWAS-Economic community of west African state).</p>	<p>exchange rate volatility and foreign direct investment flows for a subset of ECOWAS nations.</p>	<p>of GDP. market size and growth. infrastructure availability proxy as the number of telephones subscribes per 100 people. trade openness'-is the exchange rate volatility decomposed into nominal exchange rate & real exchange rate.</p>	<p>ADF Test. Phillips-perron (pp) Test.</p>	<p>Ghana, Sierra Leone, and Nigeria alone, the projected coefficient of nominal exchange rate volatility is negative in all of the countries that were chosen. On the other hand, as would be predicted, the impact of real exchange rate fluctuation is negatively significant in Sierra Leone, Nigeria, Togo, and Cote d'Ivoire. In Ghana and the Gambia, the effect is statistically insignificant but positive.</p>
20	<p>Huong et al. (2021). Exchange Rate Volatility and FDI Response during the Financial Crisis:</p>	<p>The purpose of this study is to investigate how Vietnam's real effective exchange rate volatility affects FDI.</p>	<p>Dependent variable FDI. Independent variable is real effective exchange</p>	<p>Vector Autoregression Model.</p>	<p>According to the estimation results, at the 5% significance level, FDI reacted significantly to real exchange rate volatility with a lag of three periods.</p>

	Empirical Evidence from Vietnam.		rate volatility.		
21	Leasiwal et al. (2022). Impact of macroeconomic indicators: Economic growth, inflation, interest rates, and exchange rate on the condition of FDI in Indonesia.	This study aims for knowing influence growth economy, inflation, interest rate, and value rate to FDI investment in Indonesia.	Dependent variable = FDI. Independent variable is, economic growth (PE), Inflation, Interest rate (SBI interest rate), Exchange rate etc.	Multiple Regression Analysis.	Research results shows that economic growth and exchange rate have an effect positive but no significance to FDI investment, while, inflation and interest rate have a negative and significant effect on FDI investment in Indonesia. Ethnic group flower is the most influential factor strong to FDI investment in Indonesia.
22	Adewale and Comfort (2022). Nexus between exchange rate fluctuation and FDI in Nigeria.	This study looked at the relationship between FDI in Nigeria and fluctuations in exchange rates.	Dependent variable is foreign direct investment. Independent variables are exchange rate, interest rate, trade openness	Autoregressive Distributed Lag (ARDL) model.	The results showed that there was a negative correlation between FDI and the exchange rate in Nigeria. Additionally, every lagged exchange rate value was statistically significant at the 5%

			and gross capital formation.		level of significance, indicating the significance of the exchange rate for FDI inflows into Nigeria.
II)	National Context:				
1	Bista (2005). FDI in Nepal.	To find out the relationship between FDI and economic growth and FDI and export trade specifying the export trade to India and to the third world countries.	FDI – independent variable. Real GDP- dependent variable. Export trade - dependent variable.	Simple Regression Model. (Descriptive and Analytical Method)	The result of that study was the contribution of FDI to real GDP and export trade is positive with significant change value.
2	Adhikary (2015). Dynamic Effect of FDI, Trade Openness, Capital formation and Human Capital Formation on the Economic Growth Rate in	To determine the influence of FDI, trade openness, capital formation, and human capital formation on Nepal's economic expansion.	GDP per capita growth – dependent variable. Independent variables are: FDI, trade Openness, capital formation	Vector Error Correction (VEC) model. (Based on Granger Causality Test)	This study shows that there is a long-term equilibrium relationship between the variables. Additionally, trade liberalization and FDI have a positive dynamic impact on Nepal's GDP per capita growth rate.

	the Least Developed Economies: Evident from Nepal.		and human Capital formation etc.		
3	Bista (2017). Economics Liberalization in Nepal: Determinants, Structure and Trends of FDI.	This study examined the relationship between FDI and GDP along with the impact of FDI determinants on FDI inflows in Nepal.	GDP – dependent variable. Independent variables are: FDI, export, GDP ratio, privatization and liberalization (taking as dummy variables).	Multiple Regression Model (Based on Cobb Douglas production model).	The results indicate the positive relationship between GDP and FDI. Furthermore, liberalization and privatization policies are positive but insecurity is disturbing.
4	Phuyal and Sunuwar (2018). A Sectoral analysis of FDI on Economic Growth of Nepal.	This essay attempts to investigate how FDI affects Nepal's economic growth by sector.	GDP – dependent variable. FDI – Independent variable.	Linear Regression Analysis.	According to all of the inferential analysis's findings, FDI in the travel, tourist, and agricultural sectors will significantly and favorably affect GDP throughout the specified period of time.

5	<p>Essayad et al. (2018). Remittances and real exchange rate in south Asia: The case of Nepal.</p>	<p>This paper attempts to investigate the impact of economic variables including remittances on the foreign exchange rate of the Nepalese rupee.</p>	<p>Dependent variables Real exchange rate.</p> <p>Independent variables are worker remittance, foreign aid, GDP per capita, change in terms in trade and government expenditure.</p>	<p>ARDL model, and ADF test.</p>	<p>The empirical results show that there is evidence that increasing remittance inflows leads to currency depreciation in the short-run and currency appreciation in the in the long-run.</p>
6	<p>Pokharel and Pokharel (2019). Impact of FDI on Economic Growth of Nepal.</p>	<p>The purpose of this essay is to look into how FDI has affected Nepal's economic expansion.</p>	<p>GDP – dependent variable.</p> <p>Independent variables are: FDI and GFCF (Gross Fixed Capital Formation).</p>	<p>Multiple Regression Model (Unit root test, Granger causality test and Ordinary least square).</p>	<p>With a positive and significant link between GDP, FDI, and GFCF, the model is noteworthy overall.</p>

7	Neupane (2020). FDI in Nepal.	This study aims to investigate the relationship between GDP and FDI.	GDP – dependent variable. Independent variables are: FDI and Employment.	Descriptive Analysis.	This article's novel conclusion is that FDI has little effect on capital formation and employment in the Nepalese economy, and as a result, it contributes less to GDP. It also showed that FDI includes new technology, financial resources, management strategies, and market access for the manufacturing and transportation of goods and services.
8	Kharel (2020). FDI in Nepal: A study on its impact on Employment.	This study's primary goal is to examine Nepal's overall foreign investment climate. The study's specific goal is to assess how FDI has grown and changed over time, as well as	FDI and Employment.	Multiple Regression Analysis. Descriptive Analysis.	The outcome demonstrates a strong correlation between FDI changes and employment. According to the results of a multiple regression study, employment and foreign direct investment, FDI

		how it affects employment.			significantly predicts employment.
9	Chaudhari et al. (2020). Impact of covid-19 pandemic on FDI in Nepal from South Asian Perspectives.	This investigation aims to find the impact of covid-19 on FDI inflows and other barriers to receiving FDI commitment in Nepal.	FDI-dependent variable. Independent variable is: covid-19 situation and other barriers: Environment, weak governance, natural calamities, diverse and complex geography, tax slab, red tape and climate change.	Descriptive Analysis.	The purpose of this study is to determine how COVID-19 affects FDI inflows and other obstacles to FDI commitment in Nepal.
10	Thapa (2022). An Impact of FDI on Employment Generation in Nepalese Economy.	The goal of this study is to examine how FDI has affected Nepal's industrial sector's ability to create jobs	Employment is the dependent variables. FDI is the independent variables.	OLS, Unit Root, Cointegration, Vector auto-regression model, Granger	It seen that due to the negligible and flexible amount of FDI in Nepal, there is no long-run relationship between FDI and employment generation.

		between 1991 to 2020.		Causality test.	
11	Chettri et al. (2022). FDI and stock market development in Nepal.	To investigate the impact of FDI on the stock market development in Nepal.	Stock market development (SMD)- is the dependent variable. Independent variables are: FDI, Exchange rate, Inflation, Interest rate, Bank development.	Johansen Cointegration approach is used to determine long run relationship and VEC Granger causality test to check the causal relations between the variables.	The findings imply that while FDI has a short-term negative impact on stock market development, it has a long-term favorable influence. In the medium term, there is a negligible positive correlation between FDI and currency rates. The exchange rate's statically negative coefficient suggests that, over time, the growth of the stock market is stimulated by the home currency's appreciation.
12	Dahal and Raju (2022). An Analysis of the Exchange Rate Regime of Nepal: Determinants and Inter-Dynamic	The objective of this study is i) To identify major macroeconomic determinants of the USD-NPR exchange rate.	Dependent variables Nepalese exchange rate. Inflation, interest rate, and NEPSE index are	OLS approach. Engle-Granger cointegration.	The causal relationship through OLS regression demonstrates that though diminutive, interest rate, inflation rate, and NEPSE index are significant variables that

	Relationship with Macroeconomic Fundamentals.	<p>ii) To analyze the long-run relationship between USDINR and USD-NPR exchange rate.</p> <p>iii) To estimate inter-dynamics among major economic variables and draw some policy implications.</p>	explanatory variables.		<p>determine exchange rate in the long run.</p> <p>This explains that Nepal's exchange rate long run is determined by India's exchange rate than its own fundamentals.</p>
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Source: Author's collection

Furthermore, Cushman (1985) evaluated the annual level of FDI in the United States and other five major industrialized countries through empirical testing, with the finding that appreciation of the real exchange rate would have a favorable impact on FDI. Barnor (2011) found exchange rate regime has no discernible (significant) effect on FDI in Ghana. Elly and Ojung'a (2013) found that there are weak positive relationships between FDI and exchange rate and also there is need to control the exchange rate fluctuation in order to increase the FDI inflows in Kenya. Bilawal et al. (2014) found that the exchange rate has strong positive correlation with FDI. Zakari (2017) found that exchange rate and foreign direct investment in Nigeria are positively correlated.

Vita & Abbott (2008) pointed out that there is strong evidence of a negative and significance relationship between real exchange rate volatility and FDI inflows in UK. Ullah et al. (2012) found that FDI is positively associated with rupee depreciated and exchange rate volatility deters FDI in Pakistan. Azhar et al. (2015) found that there is a

negative relationship between exchange rate volatility and FDI for these SAARC countries.

The above explained literature are international studies about the impact of exchange rate on FDI. In Nepal, these two variables exchange rate and FDI are covered by the study about the topics as: FDI and stock market development in Nepal, which is research by Keshab Khatri Chettri, Jeevan Kumar Bhattarai and Ramji Gautam in 2022. Chettri et al. (2022) study of impact of FDI on the stock market development in Nepal and there is a small but favorable short-term correlation between FDI and currency rates.

2.3 Research Gap

As encapsulated by Froot and Stein (1991), the "relative wealth hypothesis" holds that a depreciation of the host currency might increase the relative wealth of foreign investors, which is advantageous for the acquisition of domestic businesses in the host country. Elly and Ojung'a (2013), found that there are weak positive relationships between FDI and exchange rate and also there is need to control the exchange rate fluctuation in order to increase the FDI inflows in Kenya. Jin and Zang (2013), pointed out that there is a significance positive impact of exchange rate on FDI in China. Zakari (2017) found that exchange rate and foreign direct investment in Nigeria are positively correlated. But contrary, Vita & Abbott (2008), pointed out that there is strong evidence of a negative and significance relationship between real exchange rate volatility and FDI inflows in UK. Azhar et al. (2015), found that there is a negative relationship between exchange rate volatility and FDI for these SAARC countries. Liu & Deseatnicov (2016), found that higher exchange rate volatility and anticipated depreciation both boost China's external FDI flows, but the Renminbi's appreciation has a detrimental effect on Chinese outflows.

Moreover, economics theory suggest that fixed exchange rate regimes encourage more inward flows of FDI than the floating exchange rate regimes. The exchange rate of home currency was frequently changed due to the high demand of currency of powerful economy. The value of the home currency may appreciate or depreciate, which may have a favorable or negative affect on FDI inflows. The relationship between the exchange rate and FDI has long been debated in the literature, however, some scholar has the opposite opinions. There is no consistent finding in the previous study about the

impact of exchange rate on FDI. The empirical study of impact of exchange rate on FDI in Nepalese economy has not been study until by the national and international researcher. No academic research has documented this phenomenon in the case of Nepal. This paper attempts to bridge this literature gap by investigating the impact of exchange rate on FDI in Nepal. Moreover, these papers also investigating the impact of exchange rate on FDI in India and China.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Introduction

Research methodology is a systematic process that outlines the essential steps and procedures to be followed in order to conduct research studies. Main components of research methodology are research design, data collection methods, sampling techniques, data analysis procedures and ethical considerations. Research design involves the overall structure and plan of the research, outlining the type of study and the procedures for data collection and analysis. It providing a structured framework for conducting a systematic investigation.

This research is based on secondary data and time series analysis. In order to fulfill the objective of the study, secondary data were collected from the official web side of UNCTADSTAT. The collected data were entered in excel sheet and E-views software were used for analysis of the data. Simple descriptive statistics such as arithmetic mean, ratio and percentage have been used in the analysis while the findings have been interpreted through tables and graphs. Moreover, in this study, Autoregressive Distributed Lag (ARDL) model is employed for data analysis.

3.2 Theoretical Framework

There are a number of hypotheses regarding the relationship between FDI and currency rates, and numerous researches have tried to pinpoint this theoretical relationship. According to Cushman (1985), FDI influx will be encouraged by the "relative production cost effect" theory of currency depreciation. The "relative production cost effect" idea highlights how fluctuations in exchange rates affect the host nation's level of production costs.

The exchange rate level effect on MNCs activities the theoretical prediction is that a home country's currency appreciation is expected to affect positively FDI flows due to relative wealth effect (Froot and Stein, 1991) expectation of future profitability (Campa,1993) and capital market imperfection (Blonigen,1997) arguments.

As encapsulated by Froot and Stein (1991), the "relative wealth hypothesis" holds that a depreciation of the host currency might increase the relative wealth of foreign investors, which is advantageous for the acquisition of domestic businesses in the host country. The following are a few theories regarding the relationship between FDI and exchange rates, as listed by Phillips and Ahmadi-Esfahani (2008). According to the theory of imperfect capital markets, FDI is impacted by exchange rates through the wealth effect, which creates the relative wealth channel. Relative asset valuation is impacted by currency fluctuations, according to the theory of FDI acquisition. As a result, inward FDI rises when the host country's currency depreciates. The real option strategy takes into account the possibility that a company may choose to invest overseas, and that currency rate uncertainty may have an impact on the option's predicted returns.

An alternate method that connects investment and exchange rate volatility is the hysteresis hypothesis, commonly known as the "risk aversion theory" that Dixit and Pindyck (1994) embraced. This theory hypothesizes that exchange rate volatility decreases FDI inflows, this inverse relationship is caused mainly by the sunk cost, accordingly, firms choose to avoid the risk and they choose to postpone or delay their investments when facing this high volatility of exchange rate because, simply, they will not guarantee the expected return. According to the risk aversion model, currency rate risks result from the timing discrepancies between investments and gains. As a result, businesses will only invest overseas if the anticipated returns cover all investment expenses plus the incentive to take on risk due to exchange rate fluctuations.

Based on previous research, it is unclear how exchange rates affect FDI according to these hypotheses. Because of this theoretical uncertainty, empirical research is necessary to validate the empirical relationship between exchange rates and foreign direct investment (FDI), especially in the diverse economies of China, India, and Nepal. The following are the theoretical framework shows the relationship between exchange rate which is independent variables and FDI is dependent variable.



Bilawal et al. (2014) investigated the impact of exchange rate on FDI in Pakistan during the period of 1982 to 2013. Zakari (2017) found that exchange rate and foreign direct investment in Nigeria are positively correlated during the study period of 1990 to 2015. These two studies also used the above proposed theoretical frame work for that research paper.

3.3 Research Design

A descriptive and analytical framework is used in the study's research design to examine how exchange rates impact on foreign direct investment inflows in China, India, and Nepal. This study is design in the analytical and empirical frameworks. Exchange rate fluctuations are regarded as an independent variable, and FDI as the dependent variable. This study is short term and long-term analysis, to check the impact of exchange rate on FDI in Nepal, India and China.

The conceptual framework of this study starts from the data collection to empirical analysis. This study is based on secondary time series data set from 1990 to 2022 of Nepal, India and China. The time series data sets of FDI and exchange rate were collected from the web side of UNCTAD. After the arrangement of all data, the further process can be performed through the econometric tools.

The ARDL model was used to examine the relationship between exchange rate and FDI. This study used the ARDL technique to estimate the coefficient of independent variables. The data's stationarity is tested using the Augment Dickey Fuller (ADF) test,

and the best lag length for the model in use is determined using the Akaike Information Criteria (AIC). Econometric tools are used to identify the better results. The study employed an Excel sheet to insert all data base of FDI and EXR for exporting to EViews software. This research is based on quantitative data. Information while the numerical data of exchange rate and inflows of FDI in Nepal, India and China as well the graphic representation of fact and figures are in quantitative information. The description of the exchange rate in different time period and situation of FDI inflows in Nepal, India and China, the historical background of exchange rate and FDI, moreover its nature of empirical impact of exchange rate on FDI are all qualitative. So, both qualitative and quantitative has been used.

It is clearly said that the entire research is started from the research problem raised. After, setting the objectives and hypothesis setting is the second processes. In the third, data collection processing steps are adapted. After testing the hypothesis, proper findings, policy implication, recommendations and conclusion are given to the related institutions.

3.4 Nature and Sources of Data

This research is based on secondary data and time series analysis. This study report is descriptive as well as analytical in nature. Primarily, it is based on secondary data obtained from various reports and relevant literatures are also used as required. The Secondary data thus collected from different source have been further processed and analyzed to find out the past trend of FDI and exchange rate in Nepal, India and China, future constraints of FDI flows into Nepal.

There are different types of data along with other information that has been collected to analyze the empirical impact of EXR on FDI inflows in Nepal, India and China. It is macro level study and only secondary data have been used for finding actual impact of exchange rate fluctuation on FDI.

3.5 Data Collection Method

This study is mainly based on secondary data collected from 1990 to 2022. The data of exchange rate and FDI was collected from the website of UNCTAD statistics.

Another data used in this study have been collected mainly from concern institution and the various publications carried out by: NRB, MOF, MOI, NPC, CBS, DOI, IMF and WB. Likewise, different publications as budget speech, different plan documents have been used for completion of this study.

Beside this, information has been also collected from various article, journals, magazines and newspapers as well as various web site the collected data are arranged systematically in tabular form according to the need of the study. Secondary data thus collected from different offices and departments have been further processed and analyzed to find out the past trend and structure of FDI in Nepal, India and China, future use data for analysis. Using official websites and published reports has ensured the quality and credibility of the secondary data.

3.6 Tools of Analysis

The Autoregressive Distributed Lag (ARDL) model is used for analyzing the long-run relationships and short-run dynamics between two or more variables. A statistical method for determining if two or more variables in a cointegrated system have a long-term link is the ARDL bound test. Data has been presented in graph, table, figure, etc. within the log frame of the study. The analytical procedure as follow:

The study is long term analysis, to check the impact of exchange rate on FDI in Nepal, India and China. The ARDL model is a time-series econometric technique used for analyzing the long-run relationships and short-run dynamics between two or more variables. This model is particularly popular in the field of econometrics for estimating the relationships between variables that may be integrated of different orders.

The key feature of the ARDL model is its flexibility in handling variables of mixed orders of integration, making it suitable for modeling both stationary and non-stationary time series.

Using the ARDL - limits testing approach, the aforementioned study aims to examine how exchange rates impact on FDI in Nepal, India, and China. There are some key assumptions associated with the ARDL model:

1)Linearity: The relationship between the dependent and independent variables is assumed to be linear.

- 2) No Perfect Multicollinearity: There should be no perfect linear relationship among the independent variables. Perfect multicollinearity can lead to estimation problems, as it makes it impossible to obtain unique estimates for the coefficients.
- 3) No Autocorrelation of Residuals: The error term, ε_t , is assumed to be free from autocorrelation.
- 4) Zero Mean of Residuals: The error term is assumed to have a mean of zero, indicating that, on average, the model's predictions are correct.
- 5) Homoscedasticity: The variance of the error term is assumed to be constant across all levels of the independent variables. In other words, the spread of the residuals should be roughly constant.
- 6) No Endogeneity: The independent variables are assumed to be exogenous, meaning they are not correlated with the error term. Endogeneity can lead to biased coefficient estimates.
- 7) No Serial Correlation in the Lagged Dependent Variable: This assumption is crucial for obtaining efficient and unbiased estimates.
- 8) Stationarity of Variables: Cointegration or integration of the same order is required if the variables are non-stationary. To attain stationarity, non-stationary variables should be converted or differenced.
- 9) No Perfect Collinearity: There should be no perfect linear relationship among the independent variables.
- 10) Normality of Residuals (for statistical inference): While not strictly required for estimation, normality of the residuals facilitates valid hypothesis testing and construction of confidence intervals.

The researchers should carefully check and, if necessary, address these assumptions when applying the model to empirical data to getting the validity and efficiency of the parameter estimates in the ARDL model.

a) Unit Root Test

To determine if the data are stationarity at level, first difference, or second difference, apply the unit root test. A time series with a constant mean, constant variance, and constant auto-covariance for each given lag—that is, all of which are constant across

time—is said to be stationary. This definition is based on Brooks (2014). The presumption of stationarity is the foundation of most time series research.

A unit root implies that a time series variable has a root of 1(one) in its characteristic equation. If a variable has a unit root, it is said to be a non-stationary time series. Non-stationary time series exhibit trends or random walks and do not have a constant mean and variance over time.

Regression of one time series variables on one or more times series variables often can give nonsensical or spurious results is knows as spurious regression. Spurious regression can occur when two non-stationary time series variables are regressed on each other, leading to misleading results and the appearance of a significant relationship when, in fact, there is none.

Spurious regression, sometimes known as nonsensical regression, is a well-known mistake in the use of non-stationary data in statistics. It describes the situation when two independent variables in a regression show a link. Even when there is no relationship between the variables, the regression may nonetheless produce a high R² if the time series are non-stationary. As a result, doing a regression on non-stationary data may yield attractive but meaningless findings (Brooks, 2014).

Researchers frequently use unit root tests, such as the Kwiatkowski-Phillips-Schmidt, Shin Statics (KPSS) test, the Augmented Dickey-Fuller (ADF) test (Dickey & Fuller, 1979), or the Phillips-Perron (PP) test (Phillips & Perron, 1988), to address the problem of unit roots in the ARDL framework. These tests assess whether a variable has a unit root or not. If a unit root is detected, indicating non-stationarity, differencing or other transformations may be applied to make the variable stationary before proceeding with the ARDL analysis.

A common method is applied to test for unit root is Augmented Dickey-Fuller (ADF) test. The key idea behind the ADF test is to test the null hypothesis that a unit root is present in a time series, indicating non-stationarity. If the null hypothesis cannot be rejected, it suggests that the time series has a unit root and is non-stationary. On the other hand, if the null hypothesis is rejected, it provides evidence that the time series is stationary.

The ADF test is commonly used in the context of testing for stationarity in economic and financial time series, and it plays a crucial role in the analysis of time series data before applying various econometric models, such as the ARDL model.

b) ARDL Bound Test Approach to Cointegration

Cointegration is a statistical property of time series variables that indicates they are linked by a long-run relationship, despite the fact that each individual series may be non-stationary. In simpler terms, cointegration suggests that while two or more variables may individually exhibit trends or random walks, there exists a combination of them that is stationary.

If there is a stationary linear combination of two or more non-stationary time series, they are said to be cointegrated. In a different universe, if a linear combination of two or more integrated of order one $I(1)$ times series is stationary, they are said to be co-integrated. When two or more time series have a common stochastic drift, are integrated of order one, or have independent economic time series that are stationary after differencing but have a stationary linear combination of their levels, they are said to be cointegrated. Researchers can test for the existence of long-run equilibrium relationships using co-integration methodology when the variables are non-stationary at levels but stationary in differences.

The ARDL bound test method was created by Pesaran et al. (2001) to look at the long-term relationships between the economic model's variables. A statistical method for determining if two or more variables in a cointegrated system have a long-term link is the ARDL bound test. It helps researchers determine whether there is a stable equilibrium relationship among the variables in the long run. This test is especially useful when dealing with mixed-order integrated variables i.e., order of integration of variables $I(0)$, $I(1)$, or $I(2)$. It allows researchers to assess the long-run relationship between variables with different orders of integration in a systematic manner.

By using a straightforward linear transformation, this method (Banerjee, Dolado, Galbraith & Hendry, 1993) can create a dynamic error-correction model from ARDL that integrates short-term dynamics with long-term equilibrium without sacrificing long-term information. This enables the deduction of long-term estimates that are not possible with other cointegration procedures (Sezgin & Yildirim, 2002). As a result, the ARDL method simultaneously evaluates the long- and short-term relationships.

The ARDL model includes both lagged differences and lagged levels of the variables, allowing it to capture both short-run dynamics and long-run relationships. The lagged differences capture short-run adjustments, while the lagged levels capture the long-run equilibrium relationships between the variables.

The general form of an ARDL model with two variables, $\ln FDI_t$ and $\ln EXR_t$, and lags p and q , can be represented as follows:

$$\Delta \ln FDI_t = \alpha + \beta_1 \Delta \ln FDI_{t-1} + \beta_2 \Delta \ln FDI_{t-2} + \dots + \beta_p \Delta \ln FDI_{t-p} + \gamma \ln EXR_t + \delta_1 \Delta \ln EXR_{t-1} + \delta_2 \Delta \ln EXR_{t-2} + \dots + \delta_q \Delta \ln EXR_{t-q} + \varepsilon_t$$

Here

- $\ln FDI_t$ is the dependent variable.

- $\ln EXR_t$ is the independent variable.

- α is the intercept term.

- $\beta_1, \beta_2, \dots, \beta_p$ are the autoregressive coefficients for the dependent variable.

- γ is the coefficient for the current value of the independent variable.

- $\delta_1, \delta_2, \dots, \delta_q$ are the coefficients for the lagged differences of the independent variable.

- ε_t is the error term.

The long-run relationship between $\ln FDI$ and $\ln EXR$ is captured by the coefficient γ .

The short-run dynamics are captured by the coefficients $\beta_1, \beta_2, \dots, \beta_p$ and $\delta_1, \delta_2, \dots, \delta_q$.

The ARDL model allows researchers to investigate how variables adjust in the short run and whether there is a stable long-run relationship between them. The ARDL Bound Test is often used to formally test for the presence of a long-run relationship in the context of this model.

c) **Lag Length Selection**

In time-series analysis, the lag length refers to the number of past observations used in a model to capture the temporal dependencies or autocorrelation in the data. It is an important parameter in various econometric models, including the ARDL model.

Selecting an appropriate lag length is crucial because it can significantly impact the model's performance, accuracy, and reliability. Choosing too few lags may result in the omission of important information, leading to misspecification, while selecting too many lags can introduce noise and overfitting.

Commonly used information criteria include the: Akaike Information Criterion (AIC), the Schwartz Bayesian Information Criterion (SBIC), and Hannan-Quinn Information Criterion (HQIC) can be used in order to choose the lag order. These criteria penalize models with more parameters, helping to balance goodness of fit and model complexity. Nonetheless, the best lag in the ARDL model was chosen for this research study using the AIC criterion.

d) **F-Bound Test**

A statistical method for determining if variables in a cointegrated system have a long-term relationship is the ARDL bound test. It involves testing the joint significance of the lagged levels and differences of the variables in the ARDL model. The test is crucial for understanding the dynamics of short-run adjustments and long-run relationships in a system of variables.

The null hypothesis of the ARDL Bound Test is that there is no cointegration, meaning there is no long-run relationship. The alternative hypothesis is that cointegration exists, indicating a stable long-run relationship between the variables. Compare the calculated F-statistic with critical values. These critical values depend on the sample size and the number of included lags. If the calculated F-statistic exceeds the critical values, you may reject the null hypothesis of no cointegration.

The null hypothesis that there is no co-integration is rejected in favor of co-integration if the computed F-statistics are greater than the appropriate upper bound critical values. The null hypothesis indicating no co-integration cannot be rejected if the computed F-statistics are below the lower bound critical values, indicating the lack of co-integration. The outcome is uncertain whether the computed F-statistics are inside the critical value range, or if they are between the upper and lower boundaries. The error correction term will be a helpful tool for verifying co-integration under the inclusive scenario.

Pesaran and Pesaran (1997) state that there are two processes in the ARDL approach for calculating the long-run connection. The first step is to determine whether all of the variables in the underestimated equation have a long-term relationship. Following the first step's discovery of a long-run relationship, the analysis proceeds to the second, which involves estimating the long-run relationship's coefficients and determining values. This is followed by the estimation of the variables' short-run elasticity using the ARDL model's error correction representation (Tzougas, 2013).

e) Error Correction Model

An Error Correction Model (ECM) is a statistical model that explains the short-run dynamics and long-run equilibrium relationships between variables in a cointegrated system. It is commonly used in econometrics, especially when dealing with time series data in which variables exhibit both short-term fluctuations and long-term trends.

The Error Correction Model is a valuable tool for analyzing the short-run and long-run relationships between cointegrated variables. It helps capture the dynamics of adjustment towards the equilibrium and provides insights for both economic understanding and policy formulation.

The ECM captures the short-run dynamics of how the variables adjust to deviations from the long-run equilibrium. The coefficient λ in the ECM represents the speed of adjustment to the long-run equilibrium. If λ is negative and statistically significant, it suggests that the system corrects for short-term deviations from the equilibrium in the next period.

Certain presumptions must be made for the ECM term, which is the second stage in the ARDL technique. Because the linear combination of the unsatisfactory variables is

stationary in a straightforward OLS framework, it is easy to estimate the long-run equilibrium connection without spurious regression in the F-bound test process satisfying results: -

$$\ln\text{FDI}_t = \beta_1 + \beta_2 \ln\text{EXR}_t + \varepsilon \dots\dots\dots (1)$$

There may be disequilibrium in the short run even in cases where the $\ln\text{FDI}_t$ and $\ln\text{EXR}_t$ variables are cointegrated, meaning that a long-term equilibrium relationship exists between them.

Therefore, the equilibrium error is the error term in regression equation (1), $\text{ECM} = \ln\text{FDI}_t - (\beta_1 + \beta_2 \ln\text{EXR}_t)$.

This error term can be used to connect $\ln\text{FDI}$'s long run value to its short run behavior.

Sargan (1984) was the first to employ the Error Correction Models (ECM), which later made the Engle and Granger corrections for disequilibrium widely known.

For the model to converge towards equilibrium, the ECM coefficient needs to be statistically significant and negative, meaning that it should be less than zero. Additionally, a significant ECM coefficient attests to the co-integration and stability of the long-run relationship between the independent and dependent variables. The rate of adjustment from short run to long run increases with the amount of the error correction term's negative coefficient.

f) Diagnostic Testing

In the context of the ARDL model, diagnostic testing refers to analyzing several statistical characteristics of the model's residuals in order to determine whether the model is adequate, spot possible issues, and make adjustments. Diagnostic testing is an iterative process in econometric modeling, and addressing any issues identified through these tests can improve the reliability and validity of the ARDL model.

In order to obtain the best linear unbiased estimator (BLUE), diagnostic tests must be carried out using the ARDL model. In light of previous research by Tian and Ma (2010), Hasan and Nasir (2008), and Tom Jacob et al. (2021), this study will use tests for (a) stability, (b) serial correlation, (c) heteroscedasticity, and (d) normality in the residuals

to further validate the results and guarantee that they are statistically robust. The findings can be used for the analysis if the model produces results that are satisfactory and does not contain any of the addressed biases.

(i) LM Test for Serial Correlation

Serial Correlation is check for autocorrelation in the residuals. Serial correlation suggests that there is still information in the data that the model has not captured. Diagnostic tests, such as the Durbin-Watson statistic, can be used to assess the presence of autocorrelation. In terms of mathematics, the series has a serial correlation if the condition covariance $(\epsilon_i, \epsilon_j) = 0$ for all i, j , does not hold. The regression estimator's efficiency is affected by serial correlation rather than its objectivity. To test for serial correlation, the Breusch-Godfrey test (Godfrey, 1978) is typically used. The test has the following general null hypothesis and alternative hypothesis:

$H_0: \rho = 0$, No serial correlation in the model.

$H_1: \rho \neq 0$, There is serial correlation in the model.

(ii) Test for Heteroscedasticity

Heteroscedasticity refers to the situation where the variability of the error terms in a regression model is not constant across all levels of the independent variable(s). In other words, the spread or dispersion of residuals systematically changes as the values of the independent variable(s) change. Heteroscedasticity violates one of the assumptions of classical linear regression, which assumes homoscedasticity.

Assess whether the variance of the residuals is constant over time. Heteroscedasticity can lead to inefficient parameter estimates. Diagnostic tests, such as the Breusch-Pagan test or White test, can help detect heteroscedasticity. Addressing heteroscedasticity is essential for obtaining unbiased and efficient parameter estimates in regression analysis, ensuring the validity of statistical inferences, and maintaining the overall reliability of the model.

The Breusch-Pagan test for heteroscedasticity, which has the following general null hypothesis and alternative hypothesis, will be used in this study to measure heteroscedasticity.

H_0 : Constant variance of the residuals- Homoscedasticity.

H_1 : Non-Constant variance of the residuals- Heteroscedasticity.

Decision Rule: The null hypothesis is rejected if the probability of the observed R-squared is less than the probability at the five percent significance level, and the hypothesis is accepted if the probability of the observed R-squared is greater than the probability at the five percent significance level.

(iii) Test for Normality of the Residuals

Normality of the residuals refers to the assumption that the errors or residuals from a statistical model, often a regression model, follow a normal distribution. In the context of linear regression, the residuals are the differences between the observed and predicted values. To obtain the residuals by subtracting the predicted values from the observed values. Residuals are calculated as $\text{Residual}_i = \text{Observed}_i - \text{Predicted}_i$. The normality assumption of residuals is crucial for valid statistical inferences, particularly in hypothesis testing and confidence interval construction.

Normality of residuals is a key assumption for valid statistical inferences in linear regression. If residuals are not normally distributed, hypothesis tests and confidence intervals may be biased. Non-normality of residuals may indicate the presence of outliers or influential data points. Residual analysis can help identify these observations, which may have a substantial impact on the regression results.

Using the Jarque-Bera test, the normality of the residuals is examined. The general null hypothesis and alternative hypothesis for the test are as follows: H_0 : There is normality in the residuals.

H_1 : There is non- normality in the residuals.

The null hypothesis is rejected if the Jarque-Bera statistics' computed p-value is less than the five percent (0.05) significance level. The null hypothesis is accepted if the p-value is appreciably high or more than the five percent (0.05) significance level.

iv) Test for Stability

A stability test in the context of time series analysis and econometrics assesses whether the relationships captured by a statistical model remain stable over time. Stability testing is essential for evaluating the reliability of a model's predictions and inferences, especially when the data generating process may change over different time periods.

The Cumulative Sum (CUSUM) test is a statistical tool used to detect structural breaks or shifts in a time series data. It is commonly employed in econometrics and time series analysis to identify changes in the underlying relationship or behavior of a process over time. The CUSUM test is particularly useful when researchers suspect that there may be a structural change in the data, such as a shift in the mean or variance. The Cumulative Sums (CUSUM) test is a common tool for detecting structural breaks in a time series. It involves plotting the cumulative sum of residuals against time to identify periods where the relationship between variables may change.

The CUSUM test assumes that the data are generated from a stable process during the initial period, and it aims to detect when a structural change occurs. If the CUSUM statistic crosses the upper critical threshold, it suggests evidence of a positive structural change (e.g., an upward shift). If it crosses the lower critical threshold, it suggests evidence of a negative structural change (e.g., a downward shift). The magnitude of the CUSUM value indicates the strength of the evidence. The CUSUM test is valuable for detecting shifts in the mean or variance of a time series, which may indicate structural breaks in the underlying process. The CUSUM chart helps identify the timing and direction of the change, allowing researchers to investigate potential reasons for the structural break.

The CUSUM and CUSUMQ tests, which were developed by Brown et al. (1975), can be used to evaluate the stability of the long-run and short-run coefficients. One can expand the sample size or add dummy variables if the coefficients show instability (Naiya & Manap, 2013). The test is pictorial in nature, with the residuals being updated recursively and shown against the breakpoints for the 5% significance line. It is based on the cumulative sum of the recursive residuals (CUSUM) and the cumulative sum of squared recursive residuals (CUSUMQ). The upper and lower 95% confidence bounds are shown against the cumulative sum of the recursive residuals, or CUSUM.

CUSUMQ employs the same idea. If the CUSUM and CUSUMQ plots remain within the 5% significance threshold, then the long-run and short-run coefficients are stable.

3.7 Model Specification

a) The Economic model

To capture the relationship between EXR and FDI inflows, a simple model is defined as,

$$FDI = f(EXR),$$

Where, FDI is the function of policy distortions (EXR), that can impact on FDI inflows overtimes.

To determine the following model or form, which represents the linear relationship between FDI and exchange rate:

$$FDI = f(EXR)$$

$$FDI = \beta + \beta_1 EXR ,$$

Taking log on both sides, we get,

$$\ln (FDI) = \beta_0 + \beta_1 \ln (EXR) \dots\dots\dots (1)$$

Where,

$\ln (FDI)$ = foreign direct investment.

$\ln (EXR)$ = Foreign exchange rate.

β_0 = intercept.

β_1 = The coefficient of independent variables EXR.

b) The Statistical Model

In our study, we only focus on the impact on FDI by exchange rate. Hence, we establish a simple model with two variables – FDI inflows in Nepal and exchange rate (EXR) of rupees with dollars.

$$\ln (FDI_t) = \beta_0 + \beta_1 \ln (EXR_t) + \epsilon_t \dots\dots\dots (2)$$

Where,

$\ln (FDI_t)$ = is the logarithm of FDI.

$\ln (EXR_t)$ = is the logarithm of EXR.

ϵ_t = is the residual term.

3.8 Operational Definition of Variables

In this study, FDI is use one dependent and EXR is another one independent variables.

Definition of operational variables:

- i) FDI: – Foreign direct investment is the total inflows of FDI in host country.
- ii) EXR: - Exchange rate is a price of the domestic currency against the US dollars.

Exchange rate used is the nominal exchange rate that calculated middle from exchange rate buy and sell.

CHAPTER -IV

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This chapter aims to present a rigorous and comparative analysis of FDI inflows, exchange rates, and their interplay in Nepal, India, and China. The data presented by using descriptive statistics, trends, and patterns in FDI and exchange rates over the selected time period. This chapter provide a comprehensive presentation of the data, starting with an overview of FDI and exchange rate trends in each country. The ARDL model is apply to quantify the impact of exchange rate movements on FDI, identifying significant factors influencing these relationships in each country. This chapter represents our comparative study, focusing on the empirical analysis of the impact of exchange rates on FDI inflows in three distinct economies, Nepal, India, and China. Findings will be presented and discussed, offering insights into the unique dynamics of FDI inflows and exchange rate movements in Nepal, India, and China.

FDI, as a key driver of this cross-border capital flow, is instrumental in shaping the economic landscape of nations. Exchange rates, reflecting the relative value of currencies, play a central role in influencing investment decisions. Understanding the intricate relationship between exchange rates and FDI inflows is essential for policymakers, investors, and scholars alike.

4.2 Overviews of the study

After the collection process of data, the collected information was entered in Microsoft excel. Simple descriptive statistics such as mean and percentage have been used in the analysis while the findings has been interpreted through tables, graphs, narrative texts, by using Microsoft excel and EViews software. The ARDL model is employed for data analysis. FDI inflows and exchange rate movement is presented in different tables and graphs and interpreted as in individual economies.

Since the beginning of 1980s, most of the developing and least developed economies adopted the market-led economic growth model, which include, inter alia, greater trade openness, opening up markets for foreign direct investment and development of human capital by sharing technologies and knowledge across economies, to enhance their economic growth rates. In the 1990's, foreign direct investment grew strongly with the wave of liberalization and globalization all over the world, in where Nepal, India and China also have rapidly increase the FDI inflows in these three countries. The government of Nepal's has to promote and facilitate foreign direct investment by introducing appropriate policies and legal arrangements to create an enabling environment for investment. Nepal adopted various liberalization policies, to invite foreign investment in the country. Foreign direct investment was nominal in this 1980's decades. The global waves of liberalization and globalization creates the enabling environment for capital investment in the different countries. The national government introducing appropriate policies for favorable for foreign investor.

Adhikary (2015) study shows that Nepal ought to implement a more liberalized trade policy in order to draw in foreign investment and maintain a steady rate of economic growth. Simultaneously, it needs to invest more in its human capital to reap spillover effects of foreign technologies on other sectors. For developing nations such as Nepal, foreign direct investment (FDI) is a major factor in driving industrial development and export promotion. FDI aids in the mobilization of the nation's natural resources, human capital, and capital, all of which contribute to the economy's competitiveness and dynamic nature. Foreign Direct Investment (FDI) is a significant source of financial inflows that support economic expansion and job creation in emerging nations. Additionally, it offers access to capital, markets, and new technologies and management strategies for the production and transportation of goods and services (Kharel, 2020). Aggregate FDI inflow in the region tends to incline to the trend with significant growth. In regional disaggregate FDI flow by country, there are heterogeneous trends. For example, in Bangladesh, FDI inflow trend line is found inclining with higher growth rate per annum. Furthermore, the size of FDI is also significant. However, in Nepal, FDI inflow trend line is fluctuating and declining trend with negligible size. This Nepalese FDI inflow is the opposite of South Asian FDI trend (Bista,2017).

Bista (2017) study finding that FDI structure is an important indicator to understand which types of FDI firms and FDI mother countries are interested in which sectors. This preference of FDI firms is co-integrated with national policy priority and whether this pattern of FDI structure is an optimal condition to Nepal. It can be seen in the structure from mother countries, sector, and manufacturing sector. In FDI mother countries, there is heterogeneity of approximately 37 countries, including developed and neighbor countries. Major mother countries with its contribution include India (46%), China (12%), USA (7%), South Korea (5%), Japan (4%), UK (3%), France (2%), and others 31 countries (21%). Among them, neighbor countries such as India and China, have the most FDI source for Nepal. The Sector wise distribution of FDI in Nepal are, Manufacturing (49%), Tourism (24%), service industries (21%), construction (2%), Electricity water & gas (2%), Agriculture & forestry (1%) Mineral (0%). The largest FDI firms are coming into manufacturing sector and then followed by tourism, service, etc. Except in manufacturing, tourism, and service sector, FDI inflow in construction, electricity, and agriculture is negligible; having only 2% or less than 2%. Nepal has the potential for water resources and tourism, but the largest FDI firms are coming into manufacturing sector. This sector structure indicates two major attractions which are comparative benefits of Nepalese labor and market access in both India and China under trade treaty preference. Thus, FDI in the sector seems to be market driven as well as profit driven.

When further classify manufacturing sectors, there are eight major areas and FDI utilized are: textile and Rea garment (34%), chemical and Plastic product (18%), food beverage and tobacco (17%), fabric metal (12%), basic metal product (6%), paper and P. product (5%), non-met MI product (4%), wood & wood product (2%), and other manufacturing units (3%). Thus, FDI incidence is heterogeneous within manufacturing sector in which textile and Rea garment receive the largest share, followed by chemical and Plastic product, food beverage and tobacco, and fabric metal etc. All these manufacturing sectors are value-added industries which are more domestic centered than export, except for textile and garment. In the case of textile and garment, FDI from India and China come to get US and Germany textile quota trade facility. Therefore, FDI inflow needs the reason to come into Nepal (Bista,2017).

The exchange rate is an important macroeconomic variable that facilitates the international trade of goods and services and the transfer of capital. Nepal follows a dual exchange rate system such that the Nepali rupee is currently pegged with Indian rupee but floats with the US dollar and other convertible currencies (Dahal & Raju, 2022). In 1993, India officially moved towards a “market determined exchange rate” from a fixed peg to the US dollar (Patnaik and Sengupta, 2021). China started implementing a controlled floating exchange rate regime on July 21, 2005, using a basket of currencies as a reference. This system is based on market supply and demand (Hu, 2010).

The linkage between exchange rate and FDI in Nepalese, Indian and Chinese economy examined by using the ARDL model for analyzing the long-run relationships and short-run dynamics between two variables.

4.3 Trend Analysis of FDI And Exchange Rate

This section summarizes and analyzes the developments in currency rates and foreign direct investment (FDI) in Nepal, India, and China from 1990 to 2022.

Table 2, shows the patterns in currency rates and foreign direct investment in China, India, and Nepal from 1990 to 2022.

Table No. 2 Trend in FDI & exchange rate of Nepal, India & China

Year	Nepal		India		China	
	FDI (Mn. \$)	EXR (\$)	FDI (Mn. \$)	EXR (\$)	FDI (Mn. \$)	EXR (\$)
1990	5.94	29.37	236.69	17.50	3487.11	4.78
1991	2.22	37.26	75.00	22.74	4366.34	5.32
1992	4.00	42.72	252.00	25.92	11007.51	5.51

1993	6.00	48.61	532.00	30.49	27514.95	5.76
1994	7.00	49.40	974.00	31.37	33766.50	8.62
1995	8.00	51.89	2151.00	32.43	37520.53	8.35
1996	19.16	56.69	2525.00	35.43	41725.52	8.31
1997	23.06	58.01	3619.00	36.31	45257.04	8.29
1998	12.02	65.98	2633.00	41.26	45462.75	8.28
1999	4.35	68.24	2168.00	43.06	40318.71	8.28
2000	-0.48	71.09	3587.99	44.94	40714.81	8.28
2001	20.85	74.95	5477.64	47.19	46877.59	8.28
2002	-5.95	77.88	5629.67	48.61	52742.86	8.28
2003	1.79	76.14	4321.08	46.58	53504.70	8.28
2004	-0.42	73.67	5777.81	45.32	60630.00	8.28
2005	2.45	71.37	7621.77	44.10	72406.00	8.19
2006	-6.65	72.76	20327.76	45.31	72715.00	7.97
2007	5.89	66.42	25349.89	41.35	83521.00	7.61
2008	1.01	69.76	47102.42	43.51	108312.00	6.95
2009	38.55	77.57	35633.94	48.41	94065.00	6.83
2010	86.63	73.26	27417.08	45.73	114734.00	6.77
2011	95.49	74.02	36190.46	46.67	123985.00	6.46
2012	91.98	85.23	24195.77	53.44	121073.00	6.31

2013	71.32	93.08	28199.42	58.60	123911.00	6.20
2014	30.19	97.55	34582.10	61.03	128502.00	6.14
2015	51.56	102.41	44064.10	64.15	135577.00	6.23
2016	106.13	107.38	44480.57	67.20	133711.00	6.64
2017	197.78	104.51	39903.84	65.12	136315.00	6.76
2018	67.06	108.93	42156.19	68.39	138305.00	6.62
2019	185.00	112.61	50558.33	70.42	141225.00	6.91
2020	126.49	118.35	64072.24	74.10	149342.00	6.90
2021	195.96	118.13	44735.15	73.92	180957.00	6.45
2022	65.13	125.20	49354.61	78.60	189132.41	6.73
Total	1519.51	2560.43	705905.52	1599.18	2792685.33	235.57
Average	46.05	77.59	21391.08	48.46	84626.83	7.14
AAI	1.85	2.99	1534.94	1.91	5801.42	0.06

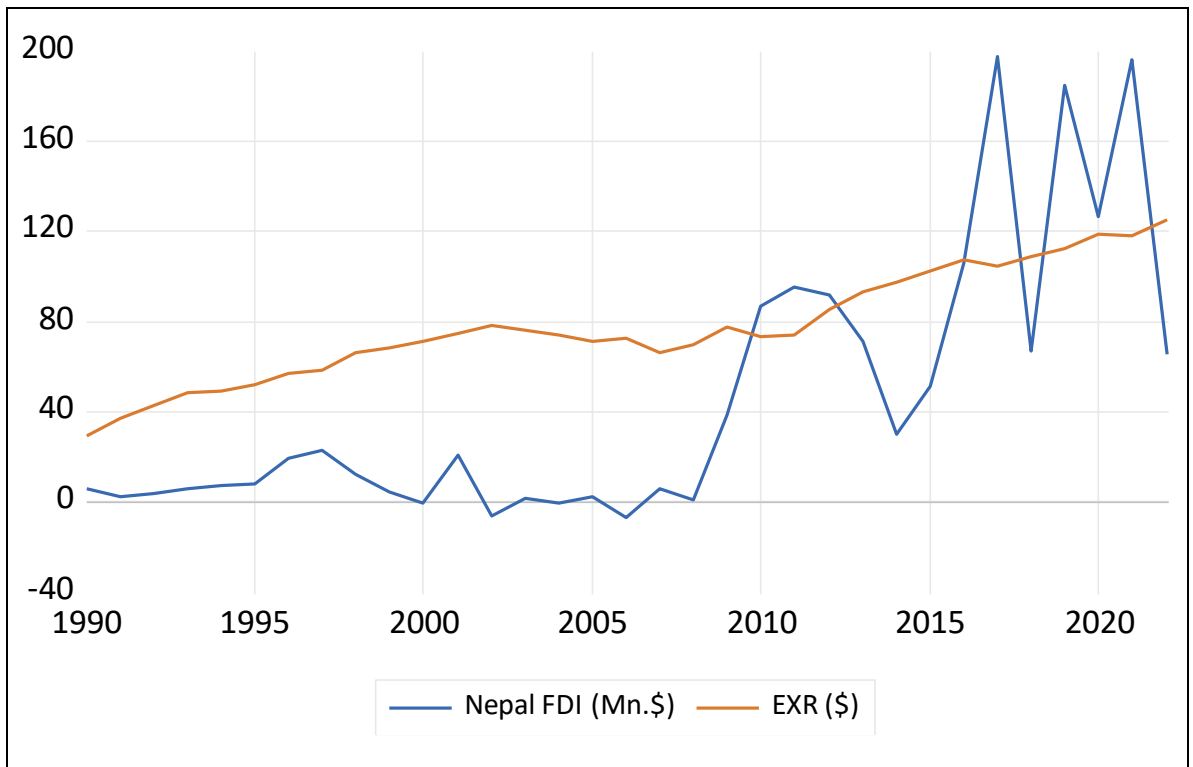
SOURCE: UNCTAD, 2023

Note: FDI inflows of Nepal during the period: 1992 -1995 was missed data. Missing data was taken from world investment report-1996.

In 1990, Nepal received US \$5.94 million in foreign direct investment; by 2022, that amount had increased to US \$65.13 million. FDI into Nepal was US \$46.05 million on average. The average annual increase (AAI) of foreign direct investment (FDI) inflows into Nepal over the study period was US \$1.85 million. Moreover, in Nepal, the percentage of FDI inflows to GDP at current price range is - 0.10% to 0.54% during the study period, which is based on annex (IV).

The Nepalese rupee's value in US dollars was 29.37, with a maximum value of Rs. 125.20. The average exchange rate for Nepalese rupees during the study period was Rs 77.75. From 1990 until 2022, the value of the Nepalese rupee declined / devaluated by an average of Rs. 2.99 per year.

Figure No. 1 Trend of FDI and Exchange Rate in Nepal



Source: UNCTAD, 2023

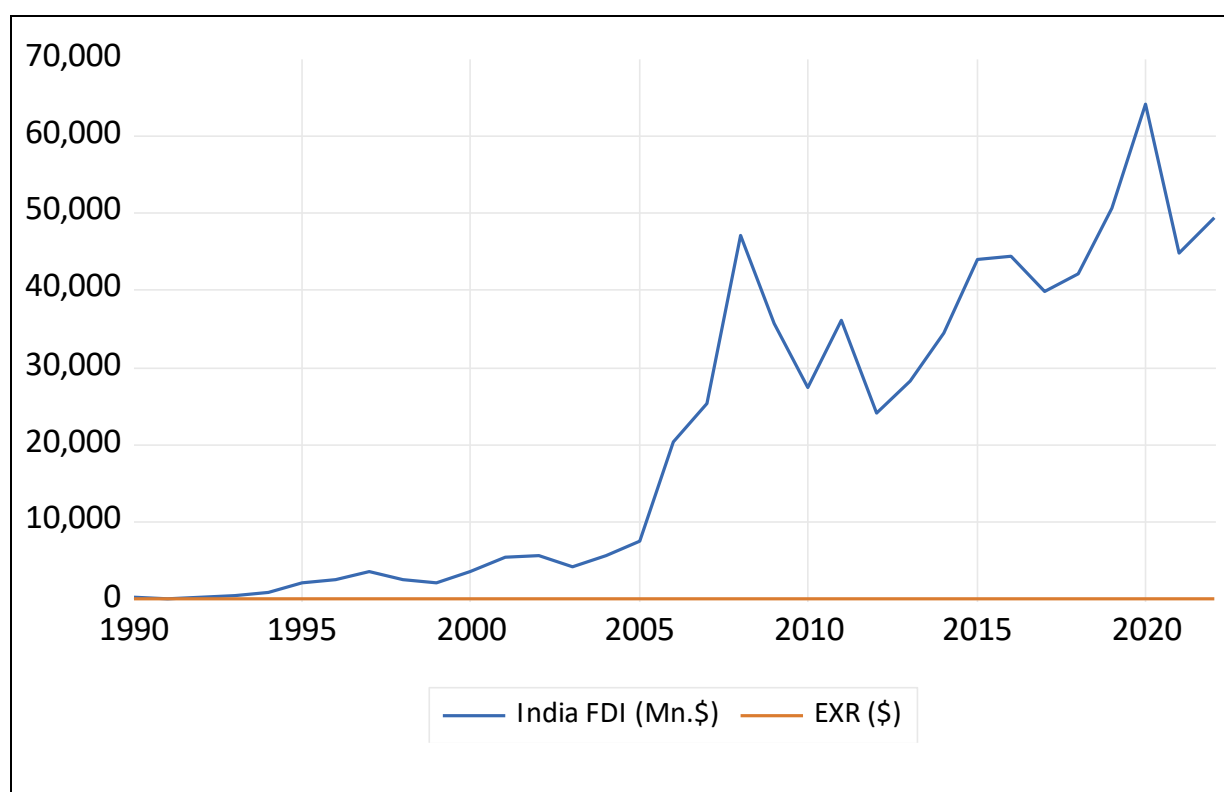
The trends of foreign direct investment in Nepal from 1990 to 2022 is unexpectedly fluctuating line. If we divide economic reform I i.e., structural adjustment program (stabilization and structural reform) from 1982 to 1990 and economic reform II (globalization, liberalization and privatization) from 1990 to 2014 and financing for reconstruction period after great earthquake 2015. In the economic reform I, FDI in flows in this period is inclined trends. But in the period II, it's found fluctuating in the beginning and then declining. In the economic reform there can be divide into two time periods: normal from 1990 to 1995, insurgency from 1996 to 2006 and transformation from 2006 to 2016. Finally, covid-19 pandemic also negative impact on FDI inflows in Nepal. In the normal period, FDI trend is fluctuating, despite adopting liberalization and privatization policy, business environment. However, overall trend of FDI inflows

in Nepal indicates somethings is lacking and unpredictable. The trend of year wise flow of foreign direct investment in Nepal is erratic and unpredictable. The main cause of these ups and down inflow of FDI in Nepal may be the high risk due to the transitional politics, unstable government and its policies, lack of investment security and internal conflict.

India received US \$236.69 million in foreign direct investment in 1990; by 2022, that amount had increased to US \$49354.61 million. FDI in India was US \$213,910.98 million on average. The average yearly increase in foreign direct investment (FDI) inflows into India throughout the study period was \$1534.94 million USD. Moreover, in India, the percentage of FDI inflows to GDP at current price range is 0.03% to 3.72% during the study period, which is based on annex (IV).

The Indian rupee's value in US dollars was 17.50 at the time, and it will increase to Rs. 78.60 in 2022. The average exchange rate for Indian rupees during the study period was Rs. 48.46. From 1990 until 2022, the value of the Indian rupee declined / devaluated by an average of Rs. 1.91per year.

Figure No. 2 Trend of FDI and exchange rate in India:



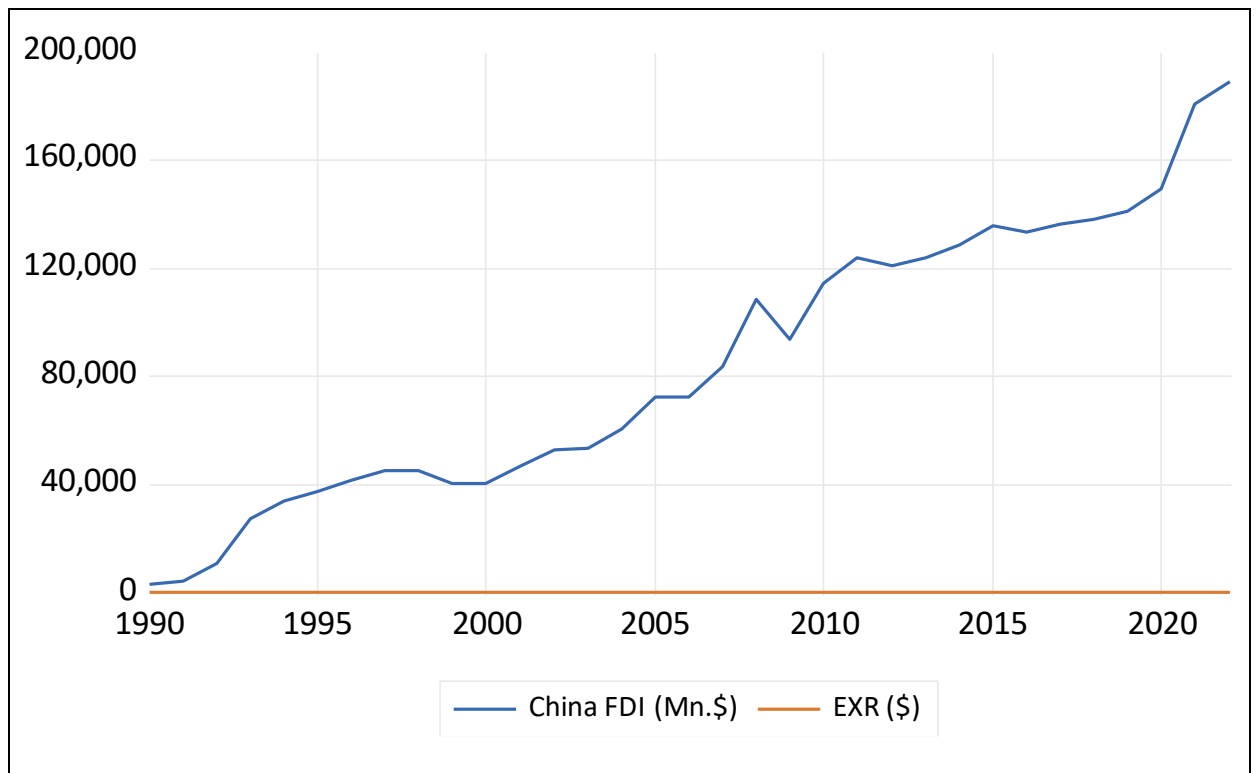
Source: UNCTAD, 2023

According to Singh (2019), the Investment climate in India has changed and improved considerably since the opening up of the economy in 1991 and more progress was achieved under it from 2014 onwards. The changes in FDI policy regime of 2017 by government of India has helped to remove multiple layers of bottlenecks faced by foreign investors. The investment processes have been rationalized and expedited. “The government has eased 87 FDI rules across 21 sectors that, opening up traditionally conservative sectors like rail infrastructure and defense. Easing of FDI norms played a pivotal role in raising the FDI in different sectors of the economy. These policies reform impact reflects on above graph showed that increasing trend in FDI in India.

In 1990, China received US\$3487.11 million in foreign direct investment; by 2022, that amount had increased to US\$189132.41 million. China received FDI worth US \$84626.83 million on average. The average yearly increase in foreign direct investment (FDI) inflows to China over the study period was US\$ 5801.42 million. Moreover, in China, the percentage of FDI inflows to GDP at current price range is 0.88% to 5.98% during the study period, which is based on annex (IV).

In 1990, the value of one Chinese Yuan in US dollars was 4.78; by 2022, it had increased to 6.73. The average exchange rate of Chinese Yuan during the study period was 7.14 rupees. It is discovered that from 1990 and 2022, the value of the Chinese Yuan declined / devaluated by an average of 0.06 Yuan per year. This shows that Chinese government control the exchange rate as compare to other neighbor country.

Figure No. 3 Trend of FDI and exchange rate in China



Source: UNCTAD, 2023

Since 1978, China had achieved an average annual economic growth rate of 9.5 % for 40 years. Its foreign trade maintains an average annual growth rate of 14.5 % since the 1990s, marking a rapid change from a closed/ socialist economy to a commercially open one (Lin & Wang, 2020).

According to Jacob et al. (2021), China's economy has risen to become the world's second biggest since the "reform and openness" and "five -year plan" were implemented. Following the economic reforms and opening-up policy, China's trade strategy changed from import substitution and self-reliance to export promotion (Yao & Zhang, 2001). This created a favorable external environment for sustained economic growth. Yao (2006) pointed out that exports (trade) and inflow of FDI are two significant drivers of China's economic success. The leap-forward improvement of China's infrastructure construction since the 1990s has also been argued to provide a strong driving force for inflow of FDI (Lin & Zhang, 2019).

In above figure 3, shows that, foreign direct investment in China was increasing trends excepts in financial crisis period. A structural break from the global financial crisis of 2007-2009 to FDI inflows in China has occurred, which was spread all over the world economy starting from USA.

4.4 Examine the Impact of Exchange Rate Volatility on FDI

The objective of our study is to examine the impact of exchange rate on FDI inflows in Nepal, India and China and compare these empirical results with each other country. For this purpose, we apply the appropriate methodology and analytical tools. In our study, the ARDL model is apply to quantify the impact of exchange rate movements on FDI, identifying significant factors influencing these relationships in three distinct economies, Nepal, India, and China respectively. The Autoregressive Distributed Lag (ARDL) model is a time-series econometric technique used for analyzing the long-run relationships and short-run dynamics between two variables: FDI and EXR in respective different country. The empirical results are present in these sections which is explain as in below.

4.4.1 Short Run and Long Run Relationship Between Macroeconomics Variables FDI and Exchange Rate

4.4.1.1 ADF Unit Root Test Results

The stationarity was checked to avoided spurious regression problem generally associated with time series econometric model. Augmented Dickey-Fuller (ADF) test was applied to examined the integration of times series data.

In Tables no.3 shows that, Nepal, India and Chinese economics data variables are integrated of order zero, I (0) and integrated of order one I (1). In case of Nepal, FDI variables are negative, first of all, it makes positive by adding similar number in series and then taking logged form. As shown in the tables the logged series of variable: FDI

is non- stationary in level form but taking first difference of the series makes them stationary.

Table No. 3 ADF Unit root test results

Economy	Variables	ADF test statistics	P - Value	Critical Values			Remark
				At 1 %	At 5 %	At 10 %	
Nepal	lnFDI	0.27371	0.7589	-2.641672	-1.952066	-1.610400	I (0)
	D(lnFDI)	-10.12948	0.0000	-2.641672	-1.952207	-1.610400	I (1)
	D(lnFDI, 2)	-6.682547	0.0000	-2.650145	-1.953381	-1.609798	I (2)
	lnEXR	3.575559	0.9998	-2.639210	-1.951687	-1.610579	I (0)
	D(lnEXR)	-4.993438	0.0003	-3.661661	-2.960411	-2.619160	I (1)
India	lnFDI	1.631037	0.9723	-2.639210	-1.951687	-1.610579	I (0)
	D(lnFDI)	-6.419835	0.0000	-3.661661	-2.960411	-2.619160	I (1)
	lnEXR	-3.54716	0.0130	-3.653730	-2.957110	-2.617434	I (0)
China	lnFDI	2.687261	0.9975	-2.639210	-1.951687	-1.610579	I (0)
	D(lnFDI)	-6.743129	0.0000	-2.647120	-1.952910	-1.610011	I (1)
	lnEXR	-6.04858	0.0001	-4.309824	-3.574244	-3.221728	I (0)

Source: Calculation based on annex I and II.

4.4.1.2 ARDL Cointegration Test Results

(a) Lag Length Selection

Table No. 4 showed that the outcome of the highest number of lags provided by HQ, AIC, SC, and FPE. Based on the Akaike information criterion, the lag order of the ARDL model is set to one (1).

Table No. 4 Optimal Lag Length Results

Economy	Lag	LogL	LR	FPE	AIC	SC	HQ
Nepal	0	-15.33239	NA	0.236912	4.391649	4.485062	4.421532
	1	0.907902*	29.23253*	0.00482*	0.339473*	0.619713*	0.429124*
India	0	-14.47174	NA	0.0099220	1.062693	1.155209	1.092851
	1	37.71930	94.28059*	0.000443*	2.046406*	1.768860*	1.955933*
China	0	23.90103	NA	0.000834	-1.412969	-1.320454	-1.382812
	1	54.82037	55.85429*	0.000147*	3.149701*	2.872155*	3.059228*

Source: Calculation based on annex I and II.

Note: * indicates lag order selected by the criterion.

(b) Bound Test Results

This study's main goal is to determine the precise effect of exchange rates on foreign direct investment in Nepal, India, and China. The short- and long-term effects of exchange rates on FDI in Nepal, India, and China are computed using the ARDL model.

The cointegration relationship between the variables in the model has been explained by applying the bound test.

(i) Long-Run Test Results

The tables 5 refer to a long-run relationship between FDI and EXR of host country as Nepal, India & China. The hypothesis setting as, null hypothesis, H_0 : No long-run relationship, and alternative hypothesis was H_1 : There is long-run co-integration relationship.

The results shown in the tables, it rejects the null hypothesis, when at 1% level of significance computed value is exceeds the upper bound.

Table No. 5 ARDL bound test for cointegration

Economy	Null Hypothesis: No long run relationship exists			Significance level	Critical Values Bounds	
					I (0) Bound	I (1) Bound
Nepal	Test Statistic	Values	Explanatory Variables (K)	At 1 %	4.94	5.58
	F - Statistic	83.993530	1	At 2.5%	4.18	4.79
				At 5 %	3.62	4.16
				At 10 %	3.02	3.51
India	Test Statistic	Values	Explanatory Variables (K)	At 1 %	4.94	5.58
	F - Statistic	23.24957	1	At 2.5%	4.18	4.79
				At 5 %	3.62	4.16
				At 10 %	3.02	3.51
China	Test Statistic	Values	Explanatory Variables (K)	At 1 %	4.94	5.58

				At 2.5%	4.18	4.79
				At 5 %	3.62	4.16
	F - Statistic	5.871975	1	At 10 %	3.02	3.51

Source: Calculation based on annex I and II.

Note: F statistics > I (1), there exist long-run relationship.

The computed F-statistics are: 83.99 ,23.25 and 5.87 which is more than the upper bound, I (1) = 5.58 at one percent level of significance in host countries Nepal, India and China respectively. It implies that the variables in this model was a long-term relationship with one another. Therefore, the findings of our research, exchange rates and foreign direct investment have a long-term relationship or co-integration in China, India, and Nepal, respectively. The estimated long-run coefficients are shown in the tables 6 as below. The empirical results show that impact of EXR on FDI is negative and statistically significance in India and China but insignificant in Nepal.

Table No. 6 Long-run coefficient test results

Economy	Cointegrating Form				
	Variable	Coefficient	Std. Error	t- Statistic	Prob.
	CointEq (-1)	-1.789883	0.110816	-16.15190	0.0000
	Cointeq = LFDI2 - (- 3.7035 *LEXR1 + 0.1213)				
	Long Run Coefficients				
	Variable	Coefficient	Std. Error	t- Statistic	Prob.
Nepal	D(LEXR)	-3.703532	2.242609	-1.651441	0.1102

	C	0.121329	0.142839	0.84941	0.4031
India	Variable	Coefficient	Std. Error	t-Statistic	Prob.
	CointEq (-1)	-1.110019	0.128405	-8.644695	0.0000
	$\text{Cointeq} = \text{LFDI1} - (-0.7031 * \text{LEXR} + 2.9323)$				
	Long Run Coefficients				
	Variable	Coefficient	Std. Error	t-Statistic	Prob.
	LEXR	-0.703081	0.203145	-3.460984	0.0017
	C	2.932309	0.790944	3.70756	0.0009
	China	Variable	Coefficient	Std. Error	t-Statistic
CointEq (-1)		-0.489239	0.112612	-4.344445	0.0002
$\text{Cointeq} = \text{LFDI1} - (-1.3443 * \text{LEXR} + 2.7716)$					
Long Run Coefficients					
Variable		Coefficient	Std. Error	t-Statistic	Prob.
LEXR		-1.344281	0.628439	-2.139078	0.0413
C		2.771557	1.241455	2.232507	0.0338

Source: Calculation based on annex I and II.

The estimated long-run coefficient of macroeconomics independent variables EXR is negative, it means that the EXR has negative influence on FDI. The increase in exchange rate of the host country leads to decrease in FDI inflows into this country. This equation also shows that capital influx into the host nation will result from the devaluation of the home currency.

(ii) Short -Run Dynamics Results of ARDL Process

A framework for creating connections between the short-run and long-run approaches to econometric modeling is offered by the error correction model (ECM). The Error Correction Model (ECM) examines the long-term impacts and short-term dynamics of variables in three distinct host countries: China, India, and Nepal. Strong evidence that the variables are cointegrated is also provided by the negative and significant error correction coefficient.

Table No. 7 ECM test for short run relationship

Economy	Variables	Coefficient	Standard Error	t- Statistic	Prob. Value
Nepal	CointEq (-1)	-1.789128	0.108753	-16.45132	0.0000
	ARDL (1,0) Selected Based on AIC	R- Squared: 0.90	Adjusted R- Squared: 0.90		Durbin- Watson Stat: 2.40
India	CointEq (-1)	-1.110019	0.128405	-8.644695	0.0000
	ARDL (1,0) Selected Based on AIC	R- Squared: 0.71	Adjusted R- Squared: 0.71		Durbin- Watson Stat: 1.57
China	CointEq (-1)	-0.489237	0.112612	-4.344445	0.0002
	ARDL (1,0) Selected Based on AIC	R- Squared: 0.38	Adjusted R- Squared: 0.38		Durbin- Watson Stat: 1.34

Source: Calculation based on annex I and II.

The coefficient of the error correction term (ECT) is highly significant with expected sign, which confirm the results of bound test for co-integration. The bigger the error correction coefficient the faster will be the return to balance. The error correction term (ECT) guides the variables of the model to regenerate back to equilibrium from a previous period's disequilibrium situation.

The coefficient of error correction term in model of Nepal is estimated as negative value (-1.78913) and its highly significance at 1% significance level. It's causes by previous periods shocks in the system. The system is getting converge back to long-run equilibrium at the speed of 178 percent. Thus, the results validate that a long-term relationship exists among variable in the original econometric model. The coefficient of determination R^2 is 0.90 explaining 90% of goodness of fit. Similarly, the value of adjusted squared, $R^2= 0.90$. This indicates that the regression line accounts for 90% of the variance in the dependent variable, with the remaining 10% coming from unknown factors.

The coefficient of error correction term in model of India is estimated as negative value (-1.110019) and its highly significance at 1% significance level. It's causes by previous periods shocks in the system. The system is getting converge back to long-run equilibrium at the speed of 111 percent. Thus, the results validate that a long-term relationship exists among variable in the original econometric model. The coefficient of determination R^2 is 0.71 explaining 71% of goodness of fit. Similarly, the value of adjusted squared, $R^2= 0.71$. This indicates that the regression line accounts for 71% of the total variation in the dependent variable, with the remaining 29% coming from unknown factors.

The coefficient of error correction term in model of China is estimated as negative value (-0.489237) and its highly significance at 1% significance level. It's causes by previous periods shocks in the system. The system is getting converge back to long-run equilibrium at the speed of 48 percent. Thus, the results validate that a long-term relationship exists among variable in the original econometric model. The coefficient of determination R^2 is 0.38 explaining 38% of goodness of fit. Similarly, the value of

adjusted squared, $R^2 = 0.38$. That indicates that the regression line explains 38% of the total variation in the dependent variable, with the remaining 62% coming from the unknown component.

The estimated short-run coefficient of exchange rate is negative and statistically significant at one percent significance level in India, China and Nepal.

(c) Diagnostic Test Results

Through its diagnostic test, the estimated ARDL model's reliability is further examined: (i), the Heteroscedasticity test (ii), the Serial Correlation test (iii), the Normality test (iv), and the Stability test.

(i) LM Test for Serial Correlation Test Results

Serial Correlation is check for autocorrelation in the residuals. The regression equation's error component is thought to be uncorrelated with the other terms. The results of the serial correlation are given in the tables:

Table No. 8 LM test for serial correlation

Breusch- Godfrey Serial Correlation LM Test Result				
Null hypothesis: No serial correlation at up to 1 lag.				
Economy	Statistic	Values	Probability	Prob. Value
Nepal	F- Statistic	2.126014	F (1,26)	0.1568
	Obs*R-Squared	2.267667	Chi- Square (1)	0.1321
India	F- Statistic	2.200169	F (1,27)	0.1496

	Obs*R-Squared	2.335782	Chi- Square (1)	0.1264
	F- Statistic	1.374241	F (1,27)	0.2513
China	Obs*R-Squared	1.501413	Chi- Square (1)	0.2205

Source: Calculation based on annex I and II.

The above table 8 result shows that the probability value of F- statistics are: 0.1568, 0.1496 and .2513 of the host nations: Nepal, India and China respectively. Similarly, the probability value of obs* R- Squared are: 0.1321, 0.1264 and 0.2205 of the host nations: Nepal, India and China respectively. This computed results clearly exceed 5% level of significance. These findings support the null hypothesis, which states that the residuals do not exhibit serial correlation. This outcome thus confirms the OLS method's underlying premise that there is no serial correlation of errors term.

(ii) Heteroscedasticity Test Results

The OLS approach assumed homoscedasticity, or that the residuals in time series data have a constant variance. The purpose of this test is to quantify the kind of residual variance that exists over a given amount of time. The details results are shown in table 9.

Table No. 9 Heteroscedasticity test

Heteroscedasticity Test Result				
Breusch-Pagan- Godfrey Test				
Economy	Test Statistic	Values	Probability	Prob. Value
Nepal	F- Statistic	0.875257	F (2,27)	0.4282

	Obs*R-Squared	1.826590	Chi- Square (2)	0.4012
	Scaled Explained SS	1.511714	Chi- Square (2)	0.4696
India	F- Statistic	0.449087	F (2,28)	0.6427
	Obs*R-Squared	0.963500	Chi- Square (2)	0.6177
	Scaled Explained SS	0.612007	Chi- Square (2)	0.7364
China	F- Statistic	4.508619	F (2,28)	0.0201
	Obs*R-Squared	7.551465	Chi- Square (2)	0.0229
	Scaled Explained SS	12.75646	Chi- Square (2)	0.0017

Source: Calculation based on annex I and II.

The table 9 represents that the probability value of F- statistics are: 0.4282, 0.6427, and 0.02201 of the host country Nepal, India and China respectively. Similarly, the probability value of obs* R- Squared are: 0.4012, 0.6177 and 0.0229 of the host nations: Nepal, India and China respectively. Finally, the probability value of Scaled Explained SS is: 0.4696, 0.7364 and 0.0017 of the host nations: Nepal, India and China respectively.

The probability values of F-statistics and obs* R-squared in the cases of Nepal and India purely above the 5% significance limit. It denotes the null hypothesis' acceptance. The residual shows no signs of heteroscedasticity. However, for China, the F-statistical probability value and the obs* R-squared value are below than the 5% significance level. It denotes the null hypothesis' rejection. The residual shows heteroscedasticity.

(iii) Normality Test Results

The OLS assumes that the residual error terms have a normal distribution when dealing with time series data. The residual distribution is displayed using the histogram normality test. It displays the error terms' normal or aberrant distribution. The details results are shown in the table 10, as in below:

Table No. 10 Normality test

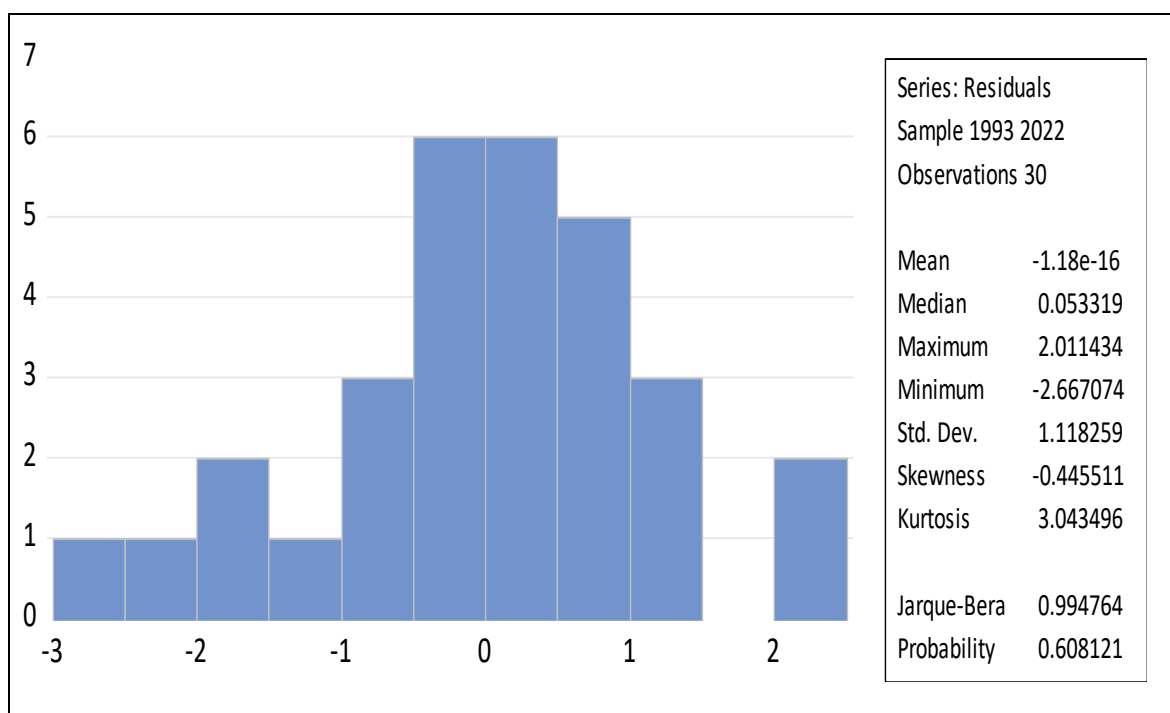
Normality Test Result		
Null hypothesis: There is normality in the residuals.		
Economy	Statistical Tools	Statistical Values
Nepal	Mean	-1.18E-16
	Median	0.053319
	Maximum	2.011434
	Minimum	-2.667074
	Std.Dev.	1.118259
	Skewness	-0.445511
	Kurtosis	3.043496
	Jarque - Bera	0.994764
India	Probability	0.608121
India	Mean	-3.26E-16
	Median	0.03082
	Maximum	0.732688

	Minimum	-0.630272
	Std.Dev.	0.332649
	Skewness	-0.305091
	Kurtosis	2.557192
	Jarque - Bera	0.731484
	Probability	0.692746
China	Mean	-7.43E-17
	Median	-0.011605
	Maximum	0.576218
	Minimum	-0.366185
	Std.Dev.	0.17531
	Skewness	0.883613
	Kurtosis	5.141295
	Jarque - Bera	9.956463
	Probability	0.006886

Source: Calculation based on annex I and II.

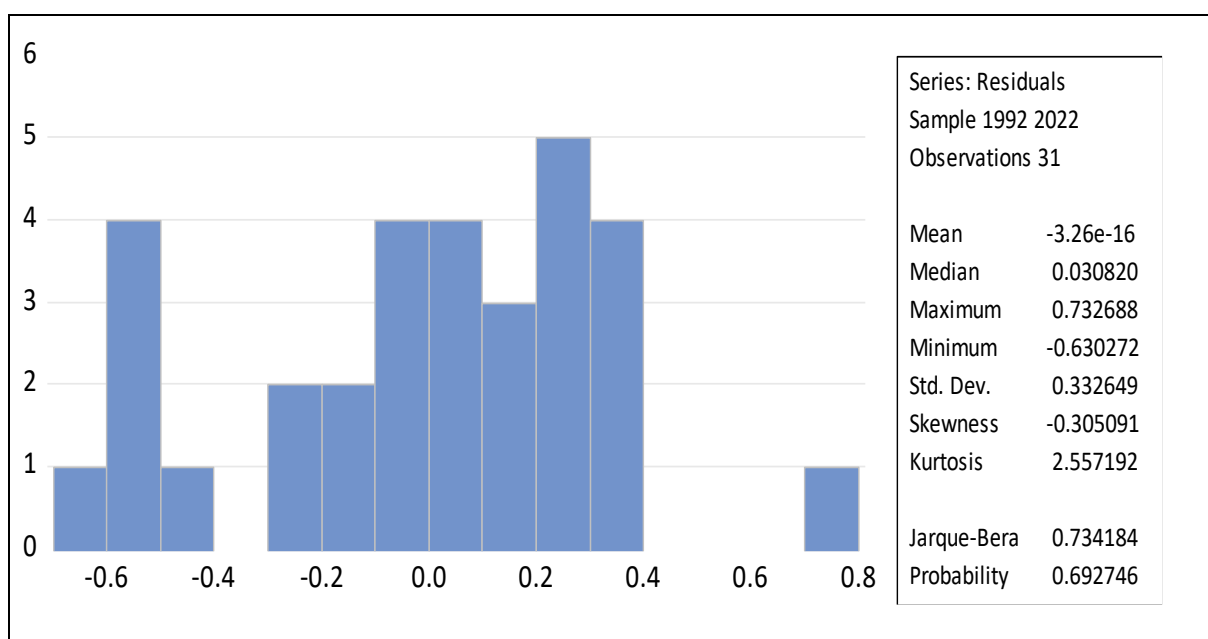
The normality distribution of the error terms is measured using the Jarque-Bera test. Regarding Nepal, the probability value is 0.608121 and the Jarque-Bera statistics are 0.994764. The Jarque-Bera statistics for India are 0.731484 and 0.692746, respectively, with respect to probability. The Jarque-Bera statistics for China are 9.956463, and the probability value is 0.006886.

Figure No. 4 Normality test of Nepal



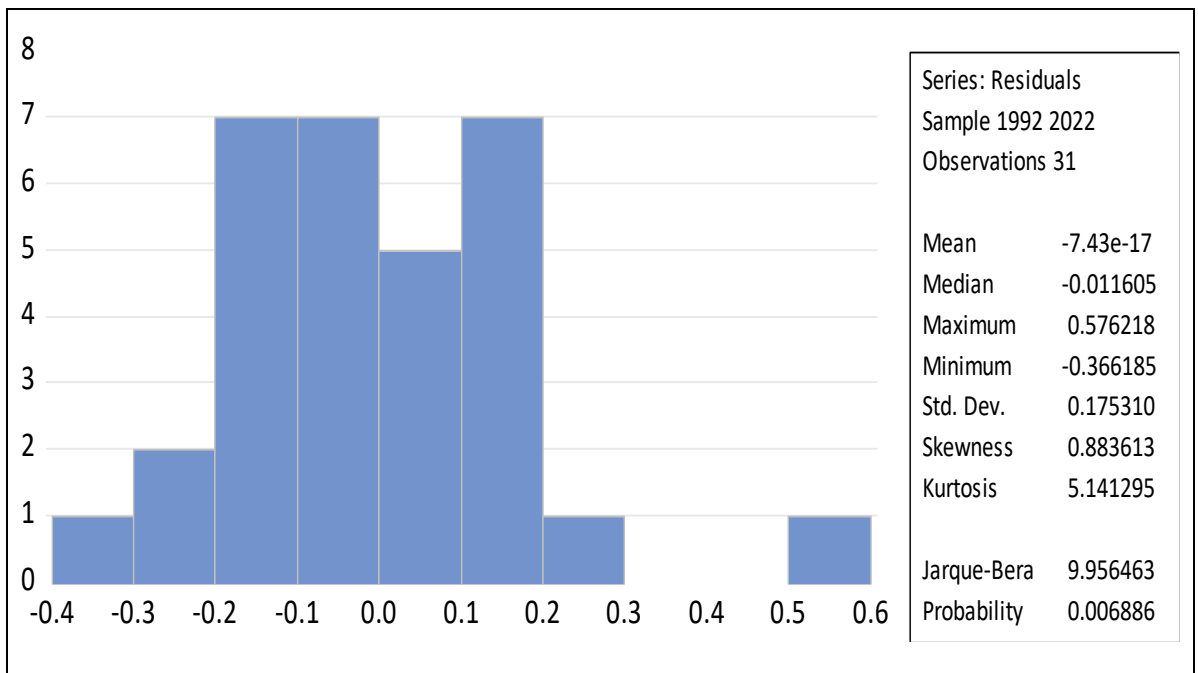
Source: Calculation using UNCTAD, 2023 data.

Figure No. 5 Normality test of India



Source: Calculation using UNCTAD, 2023 data.

Figure No. 6 Normality test of China



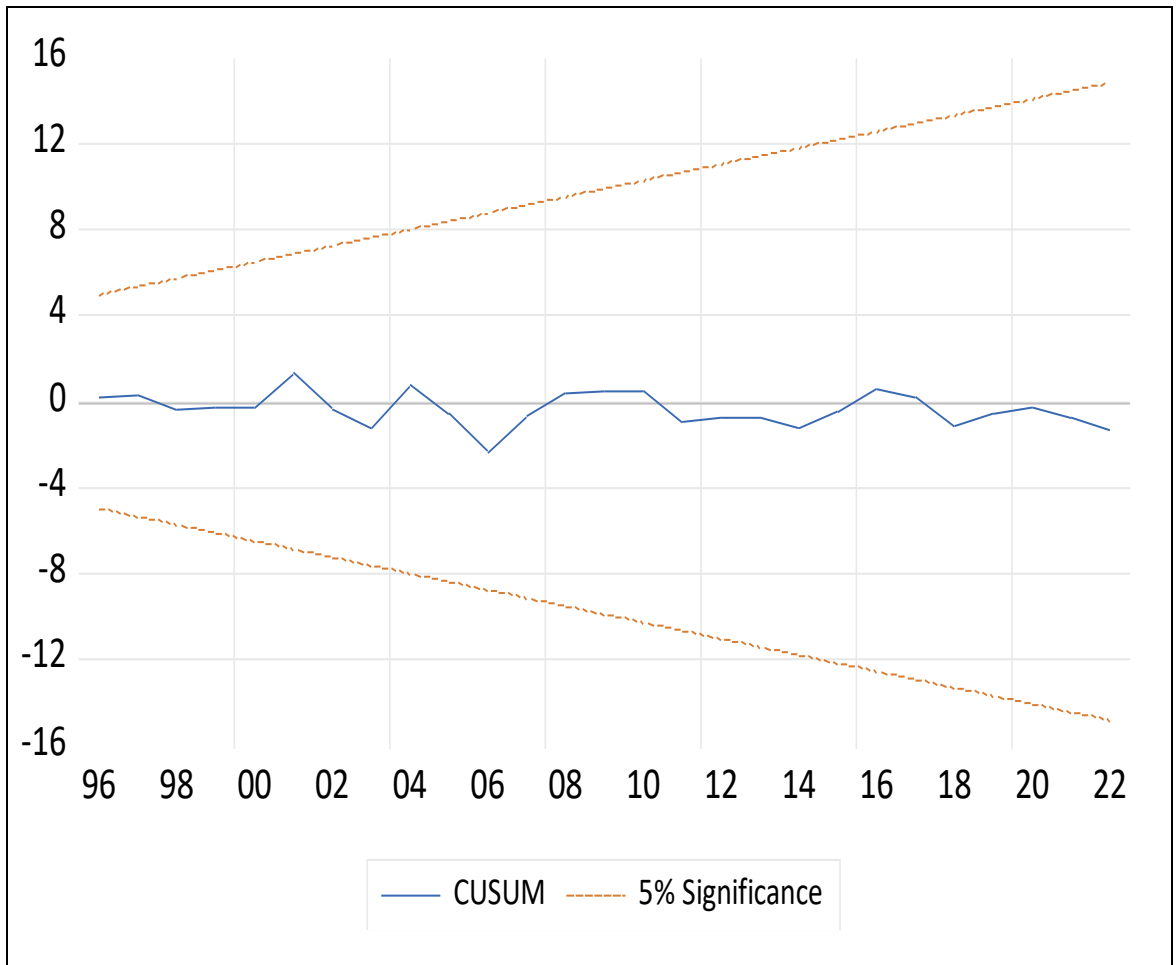
Source: Calculation using UNCTAD, 2023 data.

In case of Nepal and India, above results clearly shows that probability value are exceeds than 5% significance level. This shows that, acceptance of null hypothesis. It means that residuals are normally distributed. But in case of China, above results clearly shows that probability value is less than 5% significance level. This result shows that, rejection of null hypothesis. It means that residuals are not normally distributed.

(iv) Stability Test Results

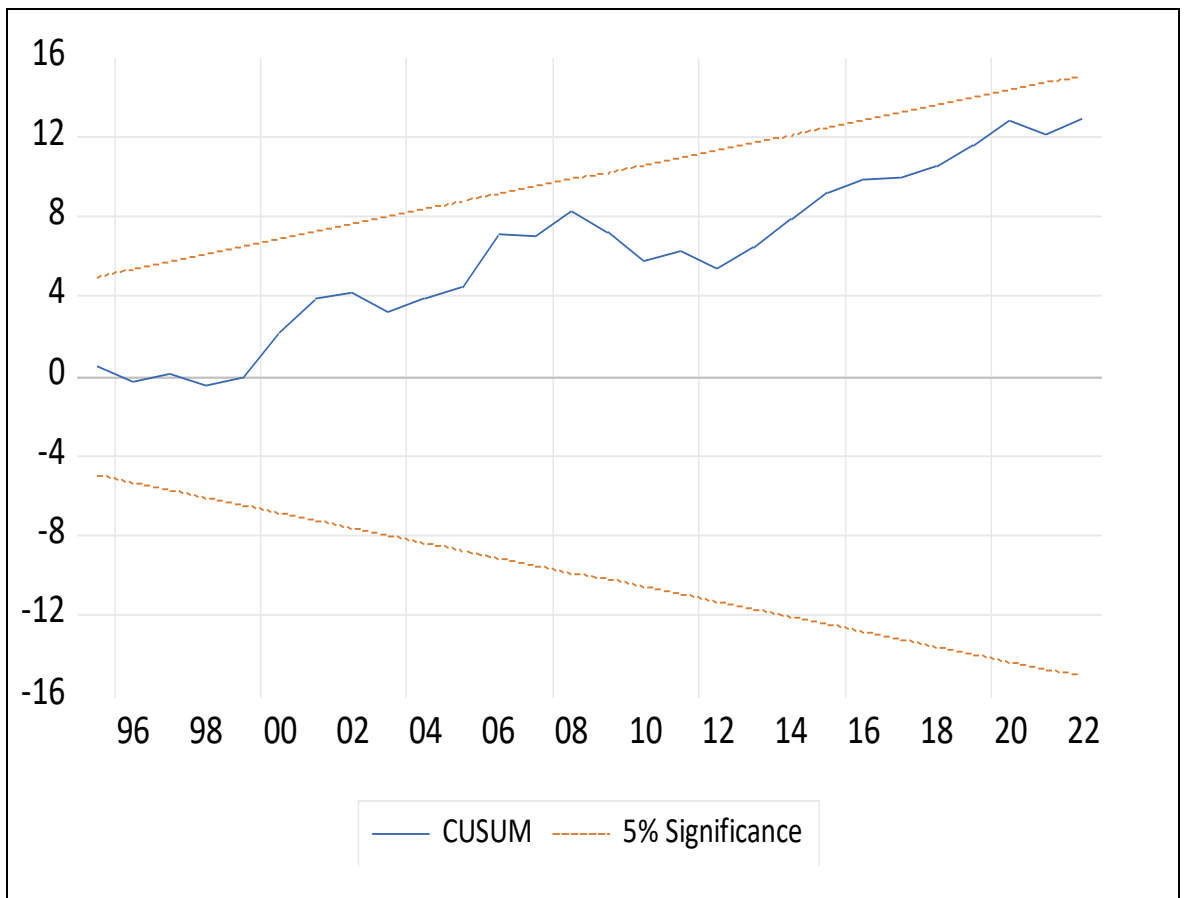
The stability of the short-run and long-run coefficient are measured by using the cumulative sum (CUSUM) and the cumulative sum of square (CUSUMQ). Figure 7,8 and 9 shows that the graphical representation of CUSUM of related economy: Nepal, India and China respectively. Similarly, figure 10,11 and 12 shows that the graphical representation of CUSUMQ of related economy: Nepal, India and China respectively. If the plot of these statistics stays within the critical bound at the 5% level of significance, the null hypothesis cannot be rejected. This means that the model is structural stability over the period of the study.

Figure No. 7 CUSUM test of Nepal



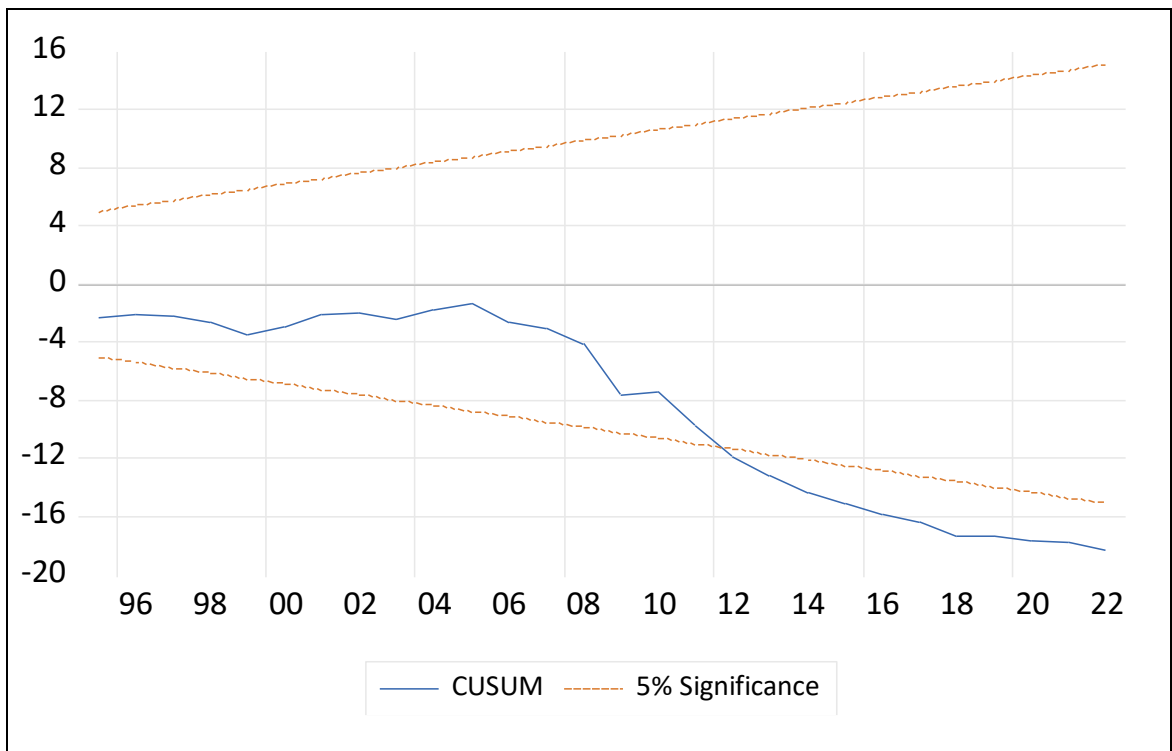
Source: Calculation using UNCTAD, 2023 data.

Figure No. 8 CUSUM test of India:



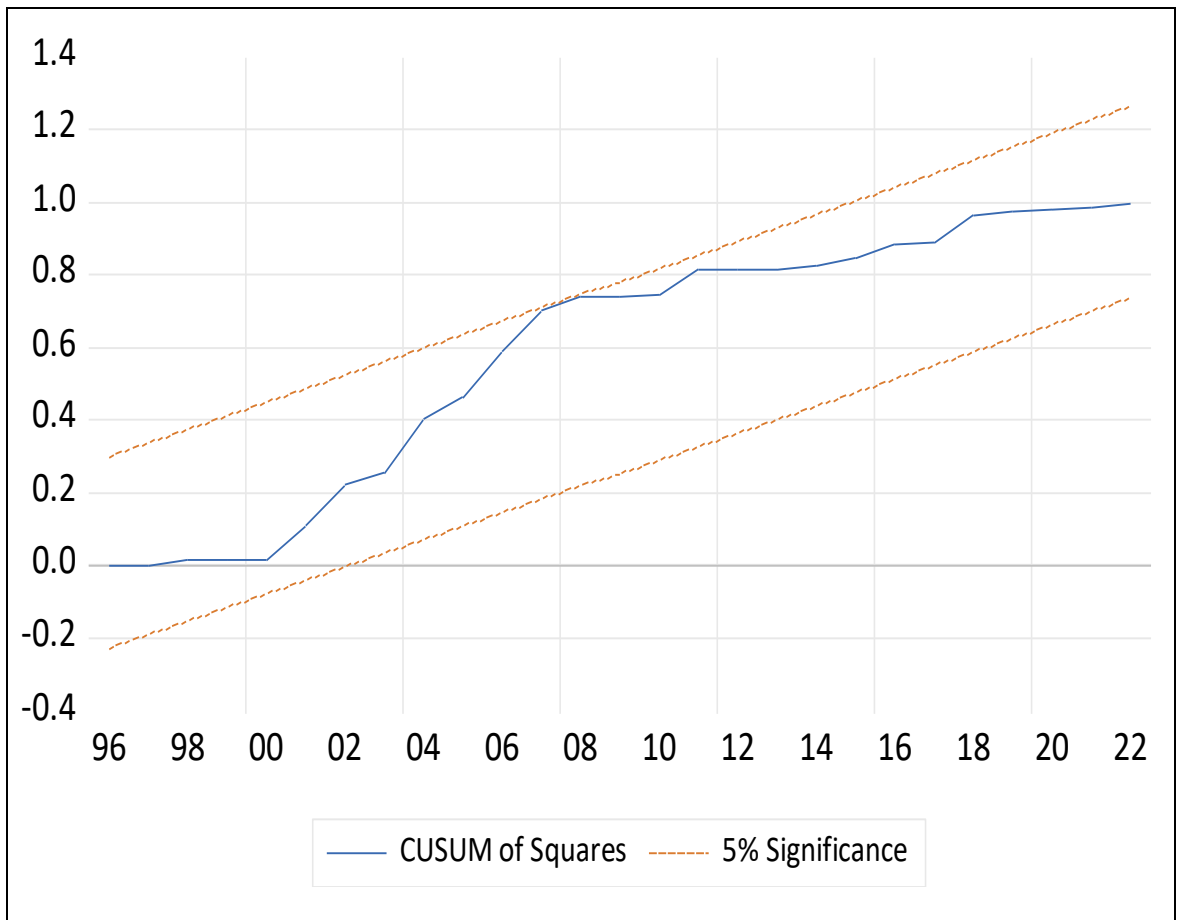
Source: Calculation using UNCTAD, 2023 data.

Figure No. 9 CUSUM test of China



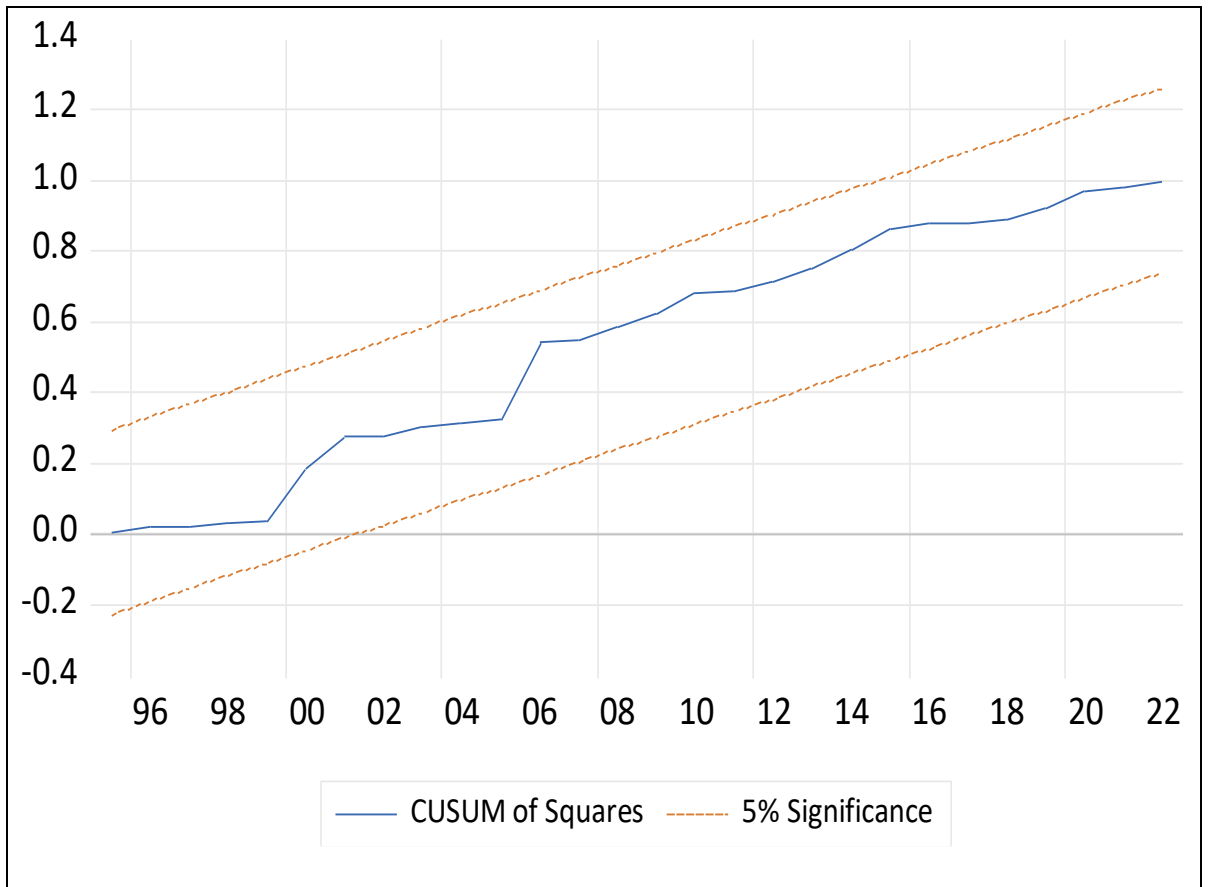
Source: Calculation using UNCTAD, 2023 data.

Figure No. 10 CUSUM of Square Test of Nepal



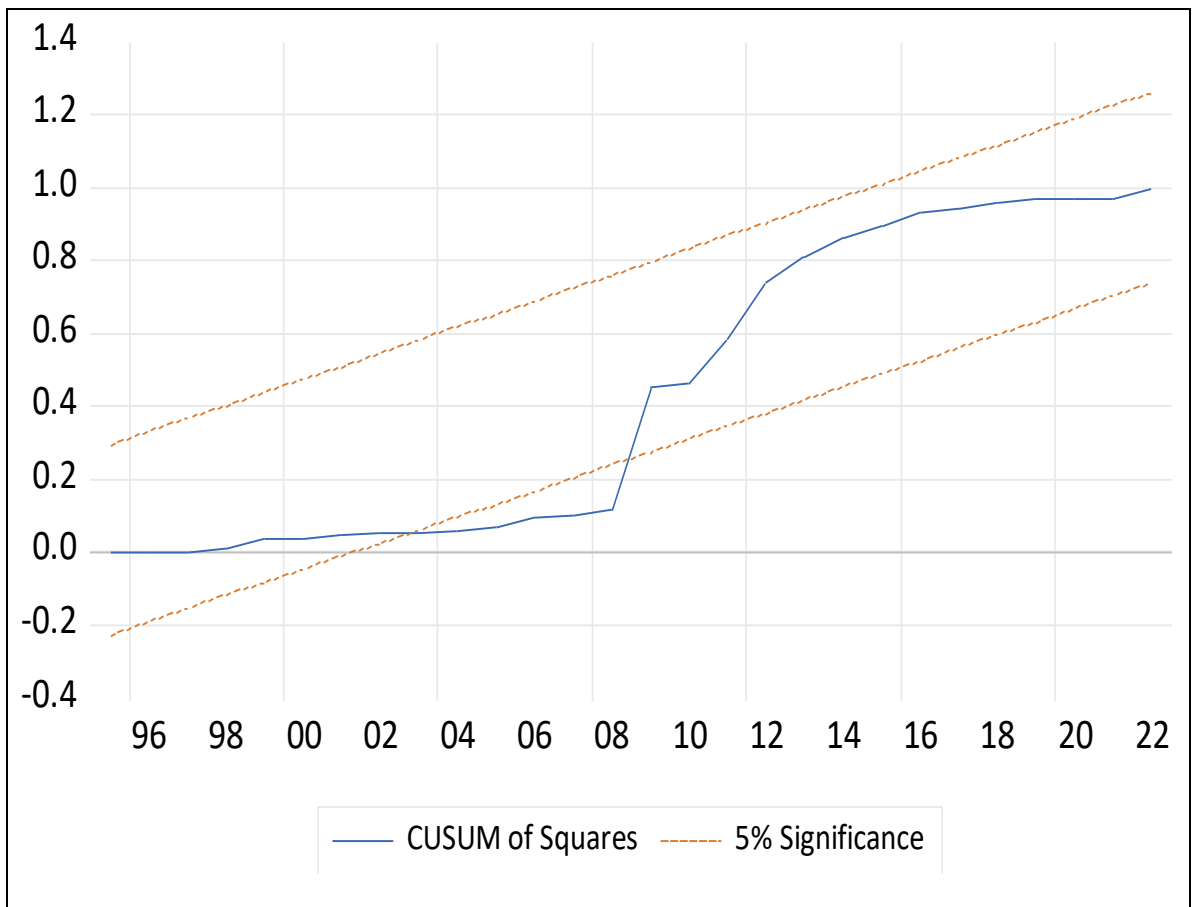
Source: Calculation using UNCTAD, 2023 data.

Figure No. 11 CUSUM of square test of India



Source: Calculation using UNCTAD, 2023 data.

Figure No. 12 CUSUM of square test of China



Source: Calculation using UNCTAD, 2023 data.

The figure 7, 10,8 and 11 shows that the graphical representation of the both the CUSUM and CUSUM of square test of related economy: Nepal and India, which are lies within the boundaries. The figure 9 and 12 shows that the graphical representation of the both the CUSUM and CUSUM of square test of China, which is goes outside the boundary. Therefore, evidence of this graphs confirms the stability of the model in case of Nepal and India but not stability of the model in case of China.

Finally, the time series model and ordinary least squares are predicated on the assumptions of homoscedasticity, stationarity, normality, and linearity. not at all multicollinear. As a result, the preceding results for Nepal and India satisfy the aforementioned assumption, however the Chinese model only partially satisfies the premise.

4.5 Discussion

The trends of foreign direct investment in Nepal from 1990 to 2022 is unexpectedly fluctuating line. The main cause of these ups and down inflow of FDI in Nepal may be the high risk due to the transitional politics, unstable government and its policies, lack of investment security and internal conflict. During the study period, average annual increment of FDI inflows in Nepal was US \$ 1.85 million per year. During the study period, average annual increment of FDI inflows in India was US \$1534.94 million per year. Similarly, during the study period, average annual increment of FDI inflows in China was US \$ 5804.42 million per year. In Nepal, the percentage of FDI inflows to GDP at current price range is -0.10% to 0.54% during the study period. Moreover, FDI inflows in Nepal is below the 1% level of GDP during the study period. In India, the percentage of FDI inflows to GDP at current price range is 0.03% to 3.72% during the study period. Similarly, In China, the percentage of FDI inflows to GDP at current price range is 0.88% to 5.98% during the study period. This data shows that China is the better investment climate for FDI during the study period. And its follows by India and try to becoming next better investment destination country. This shows, Nepal has weak FDI inflow performance. Nepal, needed to more efforts to makes the best investment destination country for attract more FDI, even thought, so many liberalization and globalization policies reform and incentive declaration. Additionally, it is revealed that the value of the Indian and Nepalese rupees decreased / devaluated by an average of Rs. 1.91 and Rs. 2.99 annually during the study period respectively. Additionally, it is revealed that the value of the Chinese Yuan declined / devaluated by an average of 0.06 Yuan annually during the study period. This shows that Nepali currency is highly devaluated as compare to others.

The long-term effects of variables as well as their short-term dynamics are examined by the ECM. The strong evidence that the variables are co-integrated is further demonstrated by the negative and significant error correction coefficient. As predicted, and at varying levels of significance, the error correction term (*ECM*) for each of the chosen countries is negatively significant. This suggests a steady convergence from short-run equilibrium deviations to the long-run equilibrium level. For every nation, the adjustment coefficient's magnitudes differ. The coefficient of error correction term (*ECM*) in model of Nepal is estimated as negative value (-1.78913) and its highly significance at 1% significance level. It's causes by previous periods shocks in the

system. The coefficient of error correction term in model of India is estimated as negative value (-1.110019) and its highly significance at 1% significance level. Similarly, the coefficient of error correction term in model of China is estimated as negative value (-0.489237) and its highly significance at 1% significance level. Thus, the estimated short-run coefficient of exchange rate is negative and statistically significant at one percent significance level in India, China and Nepal respectively.

The ARDL Bound test for cointegration results shows that there exists the long run relationship between exchange rate and foreign direct investment in Nepal, India and China respectively. Long-run Coefficient test results shows that, the estimated long-run coefficient of macroeconomics independent variables exchange rate is negative, it means that the exchange rate has negative influence on FDI. The increase in exchange rate of the host country leads to decrease in FDI inflows into this country. This equation also indicates that the devaluation of domestic currency will lead to capital inflow into host country.

The empirical results also show that impact of exchange rate on FDI is negative and statistically significance in India and China but insignificant in Nepal. In case of Nepal, the long run coefficient of exchange rate is negative and statistically insignificant implies that the inflow of FDI is very low quantity in absolute term.

This result is consistent with the research conducted by the Jacob et al. (2021), Akinlo and Onatunji (2021), Abd-EI Atti et al. (2021), Hniya et al. (2021), Moraghen et al. (2021), Jacob and Kattookaran (2019), Qamruzzaman et al. (2019), Liu and Deseatnicov (2016), Azhar et al. (2015), Ullah et al. (2012), Vita and Abott (2008), whereas this finding is contrast with the finding of: Zakari (2017), Bilawal et al. (2014), and Jin and Zang (2013).

The study is based on the theoretical perception of volatility of the exchange rate has the negative impact on FDI inflows in host country. The theoretical literature, particularly the risk aversion argument that exchange rate volatility increases risks or uncertainties for risk-averse foreign investors, thereby affecting their profits or relative asset and subsequently reducing FDI, is supported by the significance of negative

exchange rate volatility. The empirical finding of this study is also supported to the theoretical aspect.

Finally, limitation of this study was taking the exchange rate is one explanatory variable. Inflow of FDI depends on several factors- government policies, openness to trade, size of market, labor cost, the currency exchange rate etc. Cockcroft and Riddell (1991) stressed that future capital flows are directly influenced by incentives such as expected rate of return; security of investment, tax regimes, investment code or guidelines, and the macroeconomic stability especially with regards to exchange rate and inflation. Thus, exchange rate is an important factor for determining the level of FDI in host country but not the significant in Nepal. This paper considers only one factor that can impact on the FDI inflows in a country. It should be pointed out that there are other factors like government policy, inflation, openness of trade regime, labor cost, infrastructure, access to low-cost raw material, size of market, expected rate of return, inflation rate and security etc. that also needs to be investigated in order for a conclusive conclusion to be drawn from the study.

CHAPTER V

SUMMARY AND CONCLUSIONS

5.1 Introduction

This chapter presents the summary, conclusion and recommendations. The whole chapter is divided into three sections. The first section deals with summary while the second section deals with key finding and the third section deals with recommendations.

5.2 Summary

The key objective of developing countries like Nepal is to attain high economic growth rate and reduce poverty with macroeconomic stability.

Given the importance of foreign direct investment, this study focusses on the trends in exchange rate and FDI during period 1990-2022 and also investigated how currency rates affected FDI inflows in China, India, and Nepal. In order to analyze the trends of foreign direct investment in Nepal, India and China, different tools like graph, table, figure etc. have been used.

Foreign direct investment in Nepal was US \$ 5.94 million in 1990 which goes up to US \$65.13 million in 2022. The exchange rate of Nepalese rupees in US \$ was 29.37 in 1990, which goes up to Rs. 125.20 in 2022.

Foreign direct investment in India was US \$ 236.69 million in 1990 which goes up to US \$ 49354.61 million in 2022. The exchange rate of Indian rupees in US \$ was 17.50 in 1990, which goes up to Rs.78.60 in 2022.

Foreign direct investment in China was US \$ 3487.11 million in 1990 which goes up to US \$189132.41 million in 2022. The exchange rate of Chinese Yuan in US \$ was 4.78 in 1990 which goes up to 6.73 in 2022.

Till now, Nepal has been able to attract FDI of only US \$ 1519.15 million which is very low as comparison to other countries likes, India and China. Also, as compare to FDI inflow to GDP at current price ratio in Nepal is below the 1 % level. This shows that Nepal has low performance in FDI inflow. It is found that on an average Nepalese rupee has devaluated by Rs. 2.99 per years during 1990 to 2022, which is higher rate as compare to India and China.

The ARDL model calculate the impact of exchange rate on FDI in Nepal, India and China in the short term and long term. This study concluded that there exists the long-run relationship between variables FDI and exchange rate in all three nations.

The empirical data generally indicates that FDI and currency rates have a negative long-term connection. The interdependence of FDI and the host country's exchange rate is confirmed by this outcome.

The exchange rate plays significance role in influencing FDI as; reduction of cost of investment, increasing the profitability, cheaper domestic good enhancing the competitiveness of export-orientated industries, higher repatriation of profit that increase the return rate which are favorable for FDI inflows in corresponding host nations. The impact of FDI on the exchange rate which are: increase the foreign exchange reserve, higher demand for domestic currency strengthening the domestic currency, higher inflow of FDI improved the market sentiment for more investment, contribute to economic growth and stability.

But higher volatility of exchange rate, as it adds unpredictability and uncertainty situation which is demotivate factor the foreign investor. The exchange rate movement can have a feedback effect on FDI by impacting the profitability and perceived risk related to FDI. Moreover, higher inflow of FDI create the policy implication to maintain a competitive environment for exports and to prevent the currency from appreciation excessively. Therefore, it is a dynamic relationship between FDI and exchange rate can mutually influence in each other in complex ways.

5.3 Major Findings

The major findings derived from this study are as follows:

- 1) Erratic and Unpredictable FDI inflows in Nepal.

- 2) The percentage of FDI inflows to GDP at current price range is - 0.10% to 0.54% in Nepal, 0.03% to 3.72% in India and 0.88% to 5.98% in China, during the study period.
- 3) The study reveals that, on average Nepalese currency has devaluated by NPR, 2.99, Indian currency has devaluated by INR, 1.91 and Chinese currency has devaluated by CNY, 0.06 per years during 1990 to 2022.
- 4) Throughout the study period, FDI in the economies of China, India, and Nepal was adversely impacted by exchange rate volatility. It is evident that the devaluation of the home currency causes FDI inflows to rise.
- 5) Volatility in exchange rate increased the risk factors and uncertainty facing foreign investor.
- 6) It is found that there exist a long-run relationship or co-integration between exchange rate and foreign direct investment in Nepal, India and China respectively.

5.4 Conclusion

We have empirically investigated in this paper how exchange rate volatility affects foreign direct investment inflows to China, India, and Nepal. This has been achieved using secondary data collected from UNCTAD over the period 1990-2022, while employing ARDL estimating technique. The empirical results revealed that there exists the long run relationship between exchange rate and FDI inflows in Nepal, India and China.

The study results shows that impact of exchange rate on FDI is negative and statistically significance in India and China. The exchange rate policy is most sensitive to attract the FDI inflows in India and China. It is evident that FDI flows rise when the value of the host currency declines. That means currency volatility leads to decrease the performance of FDI in India and China. In case of Nepal, the study results reveals that impact of exchange rate on FDI is negative and statistically insignificant. The long run coefficient of exchange rate is negative and statistically insignificant implies that the inflow of FDI is very low quantity and effect of exchange rate is also negligible. Moreover, Nepalese's currency is currently pegging to Indian currency. This shows that

there is no any impact of exchange rate on FDI inflows in Nepal. The percentage of FDI inflows to GDP at current price range is - 0.10% to 0.54% in Nepal, 0.03% to 3.72% in India and 0.88% to 5.98% in China, during the study period. This indicates that Nepal, has the low FDI inflows performance as compared to India and China. Thus, Nepal is suffering from the various barriers to attract FDI and more effort is needed for creation of enable environment in Nepal as compare to their neighbors' countries.

5.5 Recommendations

By deepening our knowledge of the relationship between changes in foreign currency rates and foreign direct investment, this study adds to the body of literature. The results aid in the understanding of potential impacts on investment portfolio risks and returns from the interplay between foreign exchange movements and foreign direct investment (FDI) by investors and industry practitioners. Policymakers may find this research insightful and thought-provoking when considering measures to improve inward foreign direct investment (FDI) into China, India, and Nepal. Additionally, since the research's conclusions will offer guidance to decision-makers, they can adopt more sensible exchange rate policies and other incentives to draw in more foreign direct investment.

The following are the major recommendations suggested based on the findings of the study:

- 1) It is recommended that macroeconomic policy makers create stable and sound policies to stabilize the foreign exchange rate, which is one of the key factors influencing FDI flows, and prevent the overvaluation of their national currency, which could impede FDI inflows to these chosen countries.
- 2) Our policy recommendation is to minimize the exchange rate volatility and to keep exchange rate in a compatible mode.
- 3) Collaborate with international financial institutions for assistance in maintaining a stable currency.

- 4) A stable government is an essential prerequisite for any investment. Consistency in government policies is necessary for attract more FDI and prevent capital flight.
- 5) Government should undertake pro-active measures such as expansion and standardization of infrastructure: airports, sea port, stable power, development of highway, improved security etc.
- 6) Focus on education and skill development to create a qualified and skilled workforce. Moreover, encourage collaborations between local institutions and international organizations to enhance human capital.
- 7) Develop and implement long-term economic plans that address the identified long-run relationships between exchange rates and FDI.

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ANNEXES

ANNEX I: FDI inflows during the period: 1990-2022.

(Millions of Dollars)				
Year	Economy			
	World	China	India	Nepal
1990	204887.70	3487.11	236.69	5.94
1991	153959.09	4366.34	75.00	2.22
1992	164684.99	11007.51	252.00	4.00
1993	222236.60	27514.95	532.00	6.00
1994	255893.73	33766.50	974.00	7.00
1995	345142.74	37520.53	2151.00	8.00
1996	392778.66	41725.52	2525.00	19.16
1997	480628.48	45257.04	3619.00	23.06
1998	681509.29	45462.75	2633.00	12.02
1999	1078285.66	40318.71	2168.00	4.35
2000	1356685.07	40714.81	3587.99	-0.48
2001	773130.51	46877.59	5477.64	20.85
2002	590311.35	52742.86	5629.67	-5.95
2003	549570.56	53504.70	4321.08	1.79
2004	699234.50	60630.00	5777.81	-0.42
2005	954072.52	72405.69	7621.77	2.45
2006	1413371.30	72715.00	20327.76	-6.65
2007	1906638.14	83520.89	25349.89	5.89
2008	1488307.55	108312.44	47102.42	1.01

2009	1173741.50	94060.72	35633.94	38.55
2010	1393014.21	114734.24	27417.08	86.63
2011	1613465.20	123985.00	36190.46	95.49
2012	1469073.07	121073.14	24195.77	91.98
2013	1468366.96	123911.20	28199.42	71.32
2014	1411830.04	128501.56	34582.10	30.19
2015	2056416.38	135576.60	44064.10	51.56
2016	2003453.68	133711.42	44480.57	106.13
2017	1644871.86	136315.13	39903.84	197.78
2018	1375436.90	138305.89	42156.19	67.06
2019	1707830.13	141224.62	50558.33	185.00
2020	961983.21	149342.26	64072.24	126.49
2021	1478137.05	180957.21	44762.68	195.96
2022	1294738.23	189132.41	49354.61	65.13

SOURCE: UNCTAD, 2023

ANNEX II: Currency Exchange Rates, Annual, During the Period: 1990-2022.

Compare with 1 US Dollars			
Year	Economy		
	China (CNY)	India (INR)	Nepal (NPR)
1990	4.78	17.50	29.37
1991	5.32	22.74	37.26
1992	5.51	25.92	42.72
1993	5.76	30.49	48.61
1994	8.62	31.37	49.40
1995	8.35	32.43	51.89
1996	8.31	35.43	56.69
1997	8.29	36.31	58.01
1998	8.28	41.26	65.98
1999	8.28	43.06	68.24
2000	8.28	44.94	71.09
2001	8.28	47.19	74.95
2002	8.28	48.61	77.88
2003	8.28	46.58	76.14
2004	8.28	45.32	73.67
2005	8.19	44.10	71.37
2006	7.97	45.31	72.76
2007	7.61	41.35	66.42
2008	6.95	43.51	69.76
2009	6.83	48.41	77.57

2010	6.77	45.73	73.26
2011	6.46	46.67	74.02
2012	6.31	53.44	85.23
2013	6.20	58.60	93.08
2014	6.14	61.03	97.55
2015	6.23	64.15	102.41
2016	6.64	67.20	107.38
2017	6.76	65.12	104.51
2018	6.62	68.39	108.93
2019	6.91	70.42	112.61
2020	6.90	74.10	118.35
2021	6.45	73.92	118.13
2022	6.74	78.60	125.20

SOURCE: UNCTAD, 2023

ANNEX III: Gross Domestic Product, During the Period: 1990-2022.

Gross Domestic Product, At current price (in Millions)			
Year	Economy		
	China	India	Nepal
1990	394566.00	329139.00	3780.00
1991	413376.00	291200.00	3469.00
1992	493137.00	293693.00	3757.00
1993	619116.00	287274.00	3787.00
1994	564322.00	327525.00	4331.00
1995	734485.00	371783.00	4534.00
1996	863749.00	393647.00	4713.00
1997	961601.00	425545.00	5191.00
1998	1029061.00	429550.00	4895.00
1999	1094004.00	461791.00	5381.00
2000	1211331.00	476148.00	5730.00
2001	1339401.00	490659.00	5891.00
2002	1470557.00	512775.00	5979.00
2003	1660280.00	599470.00	6640.00
2004	1955347.00	703129.00	7584.00
2005	2285962.00	823612.00	8713.00
2006	2752113.00	939066.00	9612.00
2007	3550323.00	1184724.00	11875.00
2008	4594342.00	1267470.00	12840.00
2009	5101695.00	1315230.00	14179.00

2010	6087188.00	1669620.00	18365.00
2011	7551543.00	1871919.00	21065.00
2012	8532186.00	1860877.00	20639.00
2013	9570467.00	1917054.00	20962.00
2014	10475623.00	2042939.00	22430.00
2015	11061570.00	2146759.00	23667.00
2016	11233313.00	2290591.00	24288.00
2017	12310492.00	2624329.00	29443.00
2018	13894906.00	2763197.00	31732.00
2019	14279966.00	2850733.00	34268.00
2020	14687744.00	2672204.00	32859.00
2021	17734131.00	3201471.00	36207.00
2022	18076132.00	3483536.00	38683.00

SOURCE: UNCTAD, 2023

ANNEX IV: Percentage of FDI inflow to GDP at current price.

Year	Nepal	India	China
1990	0.16	0.07	0.88
1991	0.06	0.03	1.06
1992	0.11	0.09	2.23
1993	0.16	0.19	4.44
1994	0.16	0.30	5.98
1995	0.18	0.58	5.11
1996	0.41	0.64	4.83
1997	0.44	0.85	4.71
1998	0.25	0.61	4.42
1999	0.08	0.47	3.69
2000	-0.01	0.75	3.36
2001	0.35	1.12	3.50
2002	-0.10	1.10	3.59
2003	0.03	0.72	3.22
2004	-0.01	0.82	3.10
2005	0.03	0.93	3.17
2006	-0.07	2.16	2.64
2007	0.05	2.14	2.35
2008	0.01	3.72	2.36
2009	0.27	2.71	1.84
2010	0.47	1.64	1.88
2011	0.45	1.93	1.64

2012	0.45	1.30	1.42
2013	0.34	1.47	1.29
2014	0.13	1.69	1.23
2015	0.22	2.05	1.23
2016	0.44	1.94	1.19
2017	0.67	1.52	1.11
2018	0.21	1.53	1.00
2019	0.54	1.77	0.99
2020	0.38	2.40	1.02
2021	0.54	1.40	1.02
2022	0.17	1.42	1.05

SOURCE: UNCTAD, 2023