Master Thesis

A STUDY ON FACTORS INFLUENCING INFLATION WITH REFERENCE TO THE NEPALESE ECONOMY

2022

The Graduate School of Hansung University

Major in International Market Analysis

Dept. of International Trade and Economics

Dhungana Samjhana

Master Thesis
Advisor Professor Yoonkyo Cho

A STUDY ON FACTORS INFLUENCING INFLATION WITH REFERENCE TO THE NEPALESE ECONOMY

- 네팔 경제의 인플레이션 영향요인에 관한 연구 -

June 2022

The Graduate School of Hansung University
Major in International Market Analysis
Dept. of International Trade and Economics
Dhungana Samjhana

Master Thesis
Advisor Professor Yoonkyo Cho

A STUDY ON FACTORS INFLUENCING INFLATION WITH REFERENCE TO THE NEPALESE ECONOMY

- 네팔 경제의 인플레이션 영향요인에 관한 연구 -

Submit the above thesis as a master's thesis

June 2022

The Graduate School of Hansung University

Major in International Market Analysis

Dept. of International Trade and Economics

Dhungana Samjhana

Approved Dhungana Samjhana Master Thesis in International Trade and Economics

June, 2022

Judge Chair 노재확 (Sign)

Judge 이동환 (Sign)

Judge 조윤교 (Sign)

Abstract

A Study On Factors Influencing Inflation With Reference To The Nepalese Economy

Dhungana Samjhana
Major in International Market Analysis
Dept. of International Trade and Economics
The Graduate School
Hansung University

Inflation is generally and wherever a money related peculiarity and it is a strangely delicate issue in macroeconomics. It is the most discussed issue all over the world among policy makers and academia. This is because of the fact that its effects are widespread and severe and the impacts are far reaching. This study includes a comprehensive analytical outlook on the selected macroeconomic variables and their relation with Nepalese inflation during the period 1990−2020. Moreover, the issue of inflation is still debatable as it includes a multitude of factors, so it needs more updated information. This study has done a rigorous analysis to update such information with new variables like rice production. This study finds that remittance; annual rice production and control of variable foreign exchange rates have positive relations with inflation. Furthermore, this study has implications for policy makers to develop their findings and decisions

in a more adequate, structural and measureable manner to understand the effect of inflation for further economic stability of the Nepalese economy.

Keywords: [Inflation, CPI, Remittance, Exchange Rate, Nepalese Economy, Rice Production, Unemployment Rate]

Contents

LIST OF TABLES

LIST OF FIGURES

Chapter I

Introduction

1.1 Background

According to the World Bank (2021) Inflation mirrors the yearly rate change in the expense for the typical shopper of procuring a bin of labor and products that might be fixed or changed at determined stretches, like yearly. Similarly, the International Monetary Fund (2020) defines inflation as the rate of increase in prices over a given period of time. Basu (2011) in his paper understanding inflation and controlling it, explains inflation as a sustained rise in prices across the board as opposed to relative changes in the price of goods and services. Therefore, inflation includes a general increase in money supply, rises in public expenditure, excess demand, changes in the labor market, and changes in costs of production.

Inflation can be measured by using the GDP deflator, wholesale price index (WPI), and the Consumer Price Index (CPI). According to Mburu (2002), inflation is easy to identify but challenging to quantify since the choice of measurement method is influenced by available information. Nepal uses the CPI method to measure its inflation rate.
Inflation influences the economy in both positive and negative ways. The adverse consequences of Inflation contain a heightening in the open door cost of holding money, uncertainty over future Inflation which might plague speculation and reserve funds, and assuming Inflation were adequately quick, deficiencies of merchandise as

shoppers sign out of worry that costs will increment later on. Beneficial outcomes incorporate lessening the genuine heap of public and confidential obligation, keeping ostensible loan costs over zero so national banks can change loan fees to calm the economy, and dropping joblessness because of ostensible pay immovability.

There is a general agreement amongst economists that economic inflation may be caused by either an increase in money supply or a decrease in the quality of goods being supplied. Basically, there are four types of inflation: creeping inflation, walking inflation, running inflation, and jumping inflation or hyper-inflation. Economists conclude that creeping inflation is mild inflation that is not dangerous to the economy and is an important instrument of economic development. Walking inflation occurs when prices rise moderately, and the annual inflation rate is single digits. While running inflation refers to the annual inflation rate being double digits and is treated as a signal for hyper-inflation. When prices rise, inflation will affect the deprived and middle-class population. Hyper-inflation is when prices rise very rapidly and a condition when the rate of inflation becomes immeasurable and completely uncontrollable. High inflation and fluctuations in prices cause uncertainty and cost-push shock which will affect the stability and performance of the economy. Therefore, low inflation and stability in prices are always one of the core objectives targeted by policymakers in designing monetary policies (Yen & Siok, 2015).

The classical economists' famous quantity theory of money can be summarized in MV=PT, in which the velocity of money in circulation

(V) and quantity of goods (T) remain constant in the short run. So, an increase in the stock of money (M) brings a proportionate rise in the price level (P). This equation became the foundation of monetarist economic thought. Monetarist economists opine that too much money chasing too few goods is the cause of inflation. Hence, the influx of remittance money may have contributed to the rising in inflation in the Nepalese context. Inflation in Nepal increased from 4.64% in 2019 to 6.15% in 2020 (NRB, 2020). As per the modern quantity theory of money, demand for money is given by () *PQ, if the economy is in full employment, real income does not change and 'V' being equals, there is a direct and proportionate relationship between change in the quantity of money and price level. The central bank prints more paper notes to fulfill the demand for money, which directly causes inflation. However, under a less than full-employment economy, real income does not remain constant. So, 'V' being constant of real income increases by 4% together with a 10% increase in money supply implies a 6% increase in inflation- a less than proportionate rise in the price level.

Keynesian economies focus on the analysis of the short-run behavior of the economic variables and, in the short run, the price level is determined by the aggregate demand and fixed aggregate supply. For this reason, and pressure of excess demand over a fixed quantity of aggregate supply of goods and services causes an inflationary gap. However, the oil shock of 1974 created a new problem of stagflation. In other words, the world faced two new types of economic problems of hyperinflation and recession simultaneously that could not be

explained by the old Keynesian Philip curve. Many countries faced double-digit inflation rates due to supply shocks originating outside the country. Supply shocks may have a dominant role in the determination of inflation and these shocks generated outside the country cannot be controlled by domestic policy. In addition, it is seen that past experiences with inflation may influence the future expected rate of inflation (Leduc & Sill, 2014).

Herdt (1985) in an article on the economics of rice production in developing countries indicates that rice production is expressed in terms of quantities of paddy required for their purchase, and rice production is linked with inflation. Regarding rice production, In Asia,17 million has of irrigated rice area may experience physical water scarcity and 22 million ha may have economic water scarcity" by 2025 (Tuong & Bouman, 2019). Hence, rice production has a significant impact on economic indicators. In Asia, India has the largest area of rice, occupying 29.4 % of the global area, and it is an exporter of rice as well (Zeng et al., 2004). However, Nepal is also an agro-based economy; less rice production means more imports and its impacts on inflation. In an article by Blagrave (2020) Inflation, co-movement in emerging and developing Asia Co-movement (synchronicity) in inflation among emerging and developing countries in Asia is partly due to the 'monsoon effect' on rice production. Similarly, this is the case in the Nepal context as well, however, there has been no study exploring this relationship.

Similarly, the world faced the new types of economic problems of hyperinflation and recession simultaneously that could not be

explained by the old Keynesian Philip curve. Many countries face double-digit inflation rates due to supply shocks that originated outside the country. Supply shocks in rice may have a dominant role in the determination of inflation and these shocks generated outside the country cannot be controlled by domestic policy. In addition, it is seen that past experiences with inflation may influence the future expected rate of inflation (Leduc & Sill, 2004).

In Asia, the devaluation of the exchange rate and the surge in the value of imports, rise in the consumer price index (CPI), producer price index (PPI), and gross domestic product (GDP) deflator has led to inflation. The increase in these deflators was because of the devastating floods that affected agricultural products. The inflation in South American countries over the past fifteen years has been volatile because of the supply shocks, which do not reflect on aggregate demand pressures or imbalance in the money market (Patrick & Emmanuel, 2014).

The measurement of the prices in Nepal started in 1973 and Nepal has witnessed an inflation rate as low as 3.73 % to as high as 21.07 %. The determining factors of inflation can be said to the agricultural, especially the rice production rate, the supply of goods and services, the devaluation of Nepalese money to the US dollars, and the weakness of monetary policy and price hikes in fuels. (Kumar, 2013)

Europe has been categorized with the concern of inflation for some years now. For more than two decades, Turkish and Greek economies have been smashed by high and tenacious inflation. Also in Asia, the

devaluation of the exchange rate and the rise in the value of imports, hitting the consumer price index (CPI), producer price index (PPI), and gross domestic product (GDP) deflator has steered inflation. The increase in these defectors was because of the devastating floods that affected agricultural products. The inflation in South American countries over the past fifteen years has been volatile because of supply shocks, which do not reflect on aggregate demand pressures or imbalance in the money market (Patrick & Emmanuel, 2014).

Karanassou & Sala (2010) claimed that there is an interchange between inflation and unemployment in the long run in the United States because of money and productivity growth, which leads to a decrease in unemployment, while supply shocks like oil prices, which lead to an increase in unemployment. In the case of 1970, monetary expansion led to an increase in and reduced unemployment, which was very negligible, and a slowdown in productivity also led to an increase in inflation and unemployment. In 1990, losing monetary policy led to increased inflation, a decrease in unemployment very significantly and an increase in productivity also led to a decrease in the rate of inflation and unemployment. The study also concluded that an increase in productivity growth causes a decrease in inflation and also a fall in unemployment. However, this has not happened in the case of Nepal, unemployment is a big problem.

Similarly, Iqbal et al. (2013) remittances have a considerably optimistic impact on inflation, thus emphasizing the need to channel foreign remittances into fruitful investment in order to lift up economic growth in order to counter the inflationary influence of

remittances in Pakistan. Likewise, Hai and Doa (2017) That there exists a positive effect of remittances on inflation in Vietnam and these effects prolong up to three quarters; secondly, other main macroeconomic factors also affect inflation but at a lower magnitude compared with remittances. Hence, considering the Covid-crisis in Nepal, rice production remittance and
unemployment have increased and this economic phenomenon provides a significant contribution to economic analysis in this study.

1.2 Statement of Problem

Inflation of money in circulation may occur when the amount is compared to the number of goods and services offered or when there is a loss of confidence in the national currency. Inflation has become one of the major macroeconomic goals of stabilization policies because of its negative consequences on the economy. It raises the cost of doing business and, hence, discourages savings and investments. Reducing the purchasing power of the low and fixed-income groups, adversely affects consumption. Imimole & Enoma (2011) examined the determinants of inflation in Nigeria by using the autoregressive distributed lag procedure. The study found that real gross domestic product is the main determinant of inflation and exchange rate depreciation has a positive and long-run effect on inflation. The study by Sharma (1987) found a relatively strong relationship between Indian prices and Nepalese inflation

Rodrik (2007) provides evidence that a rise in remittance inflows leads to an underestimation of long-term economic growth through the overvaluation of the real exchange rate, which can potentially cause inflationary pressure. This is particularly for developing economies, where the production of tradable goods suffers from market failures and weak institutions. Despite intensive empirical studies and extensive literature on inflation, the results of these studies have been contradictory and confusing. This contradiction is attributed to the complexity of the theoretical channels that explain the impact of the interest rate on price (Kandil, 2005). Madesha et al. (2013) examined the empirical relationship between the exchange rate and inflation in Zimbabwe by using the Granger Causality test and the result revealed that both the exchange rate and inflation have a long-run relationship.

Gomme (2003) studied the relationship between inflation and employment. The study revealed that efficient allocations satisfy the condition so that the marginal value of the last unit of today's consumption equals the marginal cost of the last unit of work. An ascent in inflation diminishes the peripheral worth of the present last unit of utilization, hence prompting individuals to work less. With less work, the minor result of capital is forever diminished, bringing about a more slow pace of capital collection. This investigation discovered that killing a moderate inflation rate brings about a tiny addition in the development of result.

Samuelson & Solow (2012) in their study examined the relationship between inflation and unemployment by substituting the Consumer Price Index in the United States and it was concluded that if unemployment was held at 5–6% (if unemployment were held at 5 to 6 percent) the price index could be stable, whereas if unemployment was held at 4%, there could be a 2% increase in inflation (Pitchford, 2002). The Philips Curve shows the inverse relationship between the unemployment rate and the inflation rate, compatible with the Keynesian approach, high inflation rate, low unemployment rate, and low inflation with a high unemployment rate means that a choice can be made between combinations of these factors (Phillips,1958). Therefore, there is a necessity for much more thorough research into the dealings between unemployment and inflation in the Nepalese context, especially accepting Covid-2019.

Rising inflation has been a serious concern to NRB and necessary steps are taken to make it at a reasonable level, however, Nepal has witnessed several constraints. For example, during the Covid-19 crisis, prices of consumer products increased heavily, Similarly, the unemployment rate has increased in Nepal from 2.85 in 2019 to 4.44 in 2020 (NRB,2021) due to the covid-19 pandemic making lives measurable) but there has been a 16.5% increase in remittance during this period.

Moreover, rice production is an important part of the Nepalese economy. However, rice production is dependent on rainfall and monsoon effects due to the lack of proper irrigation in the country. Due to the import of rice, inflation may rise.

This year Nepal imported 603.725 million kilograms of rice by spending Rs 28.603 billion (NRB, 2021). In this study, this variable is unique and has not been studied before. The foremost purpose of this research is to explore whether remittance inflow, Indian inflation, rice production, and unemployment contribute to the inflationary circumstances practiced in the Nepalese economy over the study period (2001-2020).

This study aims to fill this gap with particular emphasis on Nepal, by looking at the major determinants of inflation. More specifically, the study investigates whether the independent variables (remittance, unemployment, Indian inflation, and rice production) significantly vary dependent variable (inflation) or not. This study provides empirical evidence for the major theoretical debates regarding the linkage between economic variables. Hence, based on the abovementioned research problem, the following questions have been developed for this study.

1.3 Research Question

1. How does remittance flow impact a measure of inflation in Nepale se context?
2. What are the relationship between unemployment and Nepalese infl ation?
3. What is the relationship between annual rice production and Nepal ese inflation?

1.4 Objective of the study

The major objective of this study is to analyze the pattern of inflation in Nepalese economy. However its specific objectives are as follows:

- To evaluate the impact of unemployment on inflation of Nepal.
- To investigate effect of Remittance on inflation of Nepal.
- To analyze the effect of rice production in inflation in Nepal.

1.5 Contribution:

Based on different empirical studies and literature in the area of inflation in international arenas as well as in Nepal, it can be said that there is an influence of remittance and unemployment on the level of inflation and ultimately affects the economic growth of a

country. However, in the Nepalese context, the analysis part is very limited. Hence, the outlook of this study is wider with more variables under consideration. Hence, it can be argued that this multi-disciplinary rigorous study over a long time frame will have policy implications relevant to the Nepalese economic context.

Many studies have been accomplished in different areas of economic variables. However, the area of inflation is relatively under research. Inflation is a dominant factor affecting economic growth, so it has to be studied properly. Similarly, this study tries to quantify the information about remittance and level of employment. Thus, this paper tries to analyze the dynamic determinants of inflation in the Nepalese economy, where only a few studies have been carried out. This study will further help to generalize the concept of inflation and act as a bridge for the literature gap on the subject matter under consideration in developing countries like Nepal. Besides, this study tries to give a comprehensive analytical outlook on the selected macroeconomic variables and their relation in Nepal during the period of 1990-to 2020 using a MULTI REGRESSION ANALYSIS method that is suitable for a small sample size. Moreover, the issue of inflation is still debatable; so it needs more updated information. This study has made a rigorous econometric study to update such information. This study will help policymakers to develop their judgments and decisions in a more adequate, structural, and quantifiable manner to understand the effect of inflation on the further economic stability of the Nepalese economy.

1.6 Operational definitions

Inflation

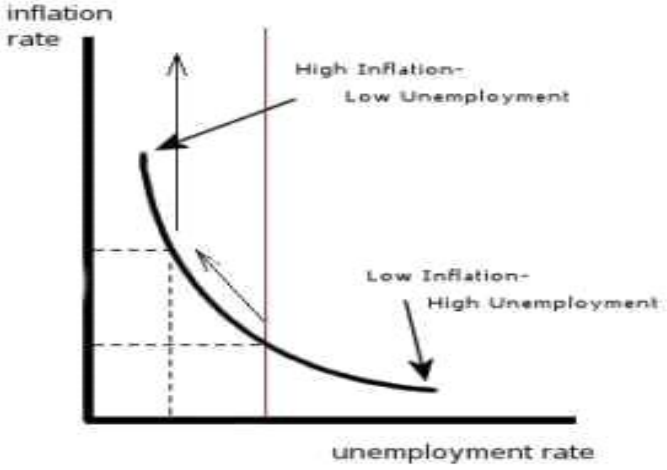
Inflation is best described as an increase in the general price level that decreases the purchasing power of the currency (Rowthorn, 1977). There are a few causes of inflation where aggregate demand increases faster than aggregate supply, thereby increasing the cost of goods and services. The imbalance of aggregate demand and supply is linked to the government deficit, expansion of bank interest rates, and the increase in foreign demand. Inflation also increases the price of goods and the price of work labor, thus the cost of goods and selling prices increase (Smyth, 1994). Inflation has a few indicators such as the Consumer Price Index (CPI), Wholesale Price Index (WPI), and Implicit Price Index (GDP deflator).

Unemployment rate

Unemployment is a condition in the economy when the supply of labor exceeds the demand of labor in the labor market. Basically, unemployment happens when an individual who is effectively looking for business can't look for a job. This is the quantity of jobless individuals partitioned by the quantity of individuals in the workforce.There are many types of unemployment, such as structural, cyclical, frictional, and seasonal unemployment. It has remained a

challenge for developing countries to sustain low inflation at a low unemployment rate, in this regard, in 1960, the concept of the Phillips curve emerged in the UK. This curve suggests a negative relationship between the rate of inflation and unemployment (Phillips1958). There are three assumptions of the Phillips curve. First, in the short run, there is a tradeoff between inflation and unemployment. Second, aggregate supply shock can break the concept of the Phillips curve, which is also known as stagflation. Third, in the long run, there is no significant trade-off between inflation and unemployment. McConnell & Brue (2007) stated that there is a short-run tradeoff between inflation and unemployment.

Philips Curve:



Remittances

The inflows or money or equivalents sent from overseas by country migrants are remittances. In search of business, education, and employment opportunities, people from developing countries migrate to developed countries. The International Organization for Migration (IOM) defines remittances as financial flows linked to migration that is a personal cash transfer by a migrant to his/ her relations or natives back home (IOM, 2020).

The number of immigrants globally has been increasing steadily. Immigrant numbers have increased swiftly between the years 2000 to 2020. There are desirable and undesirable effects of migration at 'home' and also in the 'host' country, with the desirable benefits being financial remittances among other benefits.

Nath & Silva (2012) used the VAR model on the monthly data of Mexico to examine the impact of remittances on the circulation of prices in receiving countries. The consequences of research are that remittances increase in the short run, which decreases the prices of many consumption items. Mughal (2012) observed the role of remittance as a development approach in the case of Pakistan and found that remittance has an effect on increasing demand-push inflation. The study advises that remittance should be taken as a

temporary flow and can be used to improve the macroeconomic situation, but it should not be considered a long-term strategy.

Unlike other sources of external finance, remittances tend to be more stable, making them a reliable source of financing for developing countries, since they are sent directly to the recipient and are not susceptible to bureaucratic challenges. Hence, they are more often effective than development aids (Biller, 2007).

As studies have shown, the effect of remittances on inflation is more pronounced in the long run. (Narayan, Narayan & Mishra, 2011) In evaluating the impact of inflation in the Philippines, he found that increases in inflation could prompt the sending of more remittances from migrant relatives in the short run. Moreover, the anticipation of remittances during inflationary periods has shown that remittances are not necessarily inflationary. (Paolo, Rivera & Tereso,2020).

Rice production (RF) The econometric application of the appropriate production function shows that rainfall has a significant effect on economic activities and the rate of rice production decreases, the productivity of climate-dependent sensitive sectors decreases, resulting in an increment in the price level of rice and vice-versa. To measure the impact of annual rice production on inflation, it is also considered an independent variable. In an article by Mitra & Chattopadhyay (2017) The nexus between rice production, food price

inflation and monsoon rainfall in India indicates that there are chances of high inflation just after monsoon months, especially associated with rice production, and this finding can be very useful for policy-makers. In another article by Yatsenko, H. (2020) explores the influence of weather conditions on central sectors of the Ukrainian economy and the composite index of inflation in Ukraine. The acquired conclusions show that variations in the air temperature, rain, and precipitation are noteworthy determinants of output in different sectors (specifically agriculture and mainly rice production). In an article by Blagrave (2020) Inflation co-movement in emerging and developing Asia Co-movement (synchronicity) in inflation among emerging and developing countries in Asia is partly due to the 'monsoon effect' on rice production.

1.7 Organization of the paper

The study is organized as follows: Chapter One presents the introduction of the study, Chapter Two focuses on the theoretical background and empirical analysis of remittances, unemployment, and inflation, Chapter Three gives the methodology while Chapter Four analyzes data and the results of the study. Finally, Chapter 5 presents conclusions along with policy suggestions and recommendations.

Chapter II

Literature Review And Theoretical Framework

This chapter summarizes the theories and findings from the other different researchers that have done in the same field of study. Many previous studies have indicated the impact of real GDP growth rate, money supply, market interest rate, foreign exchange rate, budget deficit, unemployment rate, Indian inflation, and remittance on inflation of the economy.

2.1 Theoretical literature

Keynesian view

Keynesian economic theory affirms that changes in money supply do not directly influence prices and that visible inflation is the consequence of pressure on the economy conveying itself on prices. There are three major types of inflation or what he normally mentions as the "triangle model" (Gordon, 1998). The demand-pull theory states that the rate of inflation quickens whenever aggregate demand is increased beyond the ability of the economy to produce. Hence, any factor that upsurges collective demand can cause inflation. Gordon (1988) says that demand inflation is advantageous to rapid economic growth in view of the fact that excess demand and favorable market conditions will stimulate investment and expansion.

Cost-push inflation, also called "supply shock inflation, " is a result of a drop in collective supply. This may be because of natural disasters, or increased prices of products. For example, a sudden decrease in the supply of oil, leading to increased oil prices, can cause cost-push inflation. Producers for whom oil is a part of their costs could then pass this on to consumers in the form of increased prices (Gordon, 1988).

Built-in inflation is encouraged by adaptive expectations, and is often linked to the "price/wage spiral". Gordon (1988) suggests that it includes workers trying to keep their plays up with prices (above the rate of inflation), and firms passing these higher labor costs on to their customers as higher prices, leading to a 'vicious circle. He says that built-in inflation mirrors events in the past, and so might be seen as hangover inflation.

The outcome of currency inflation is most noticeable when governments invests spending in a crisis, such as a civil war, by printing money exceptionally. This sometimes leads to hyperinflation, a condition where prices can double in a month or less. According to O'Sullivan and Sheffrin (2003), money supply plays a major role in determining moderate levels of inflation, although there are differences in view on how significant it is. For instance, Monetarist market analysts depend on the connection is areas of strength for extremely; financial experts, paradoxically, generally feature the job

of total interest in the economy as opposed to cash supply in deciding expansion. That is, for Keynesians, the cash supply is just a single component of aggregate interest.

Monetarist view

Monetarists acknowledge that the quickness of cash is unaffected by money related strategy (to some degree over the long haul) and the genuine worth of not set in stone in the drawn out by the useful limi t of the economy. Mankiw (2002) thought that, under this hypothesi s, the primary driver of the change in the general price level is fluct uations in the quantity of money. With exogenous velocity, the money supply governs the value of nominal output. It is likewise expressed t hat by and by, speed isn't exogenous in the short run thus the recipe doesn't naturally suggest a steady short-run connection between the cash supply and ostensible result. Be that as it may, over the long ha ul, changes in speed are supposed not set in stone by the advanceme nt of the installments component. In the event that speed is generally unaffected by financial strategy, the long-run expansion rate is equiv alent to the long-run development pace of the cash supply in additio n to the exogenous long-run pace of speed development short the lo ng-run development pace of genuine result.

2.2 Empirical literature reviews

Unemployment rate

Table 1 Major findings on unemployment rate

Study	Major findings
Bhutto et al. (2011)	There is a adverse connection between inflation and unemployment rate in the SAARC countries.
Karanassou & Sala (2010)	Tradeoff between inflation and unemployment in long run in United States. Increase in productivity growth causes decrease in inflation and also fall in unemployment.

Bhutto et al. (2011) aimed to identify the relationship between inflation and unemployment in SAARC countries from the perspective of the Phillips Curve. Unbalanced annual panel data of eight SAARC members (Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka) and six expected members of SAARC (China, Russia, Indonesia, Iran, Myanmar, and South Africa) have been used for the period 1980-2010. This paper has found that there is an adverse connection between inflation and the unemployment rate in the SAARC countries. That means the concept of the Phillips curve holds true.

Karanassou & Sala (2010) argued that there is a tradeoff between inflation and unemployment in the long run in the United States because of money and productivity growth, which leads to a decrease in unemployment, while supply shocks like oil prices, which lead to an increase in unemployment. In the case of 1970, monetary expansion led to an increase in and reduced unemployment which was very negligible and a slowdown in productivity also led to an increase in inflation and unemployment. In 1990, losing monetary policy led to increased inflation, a decrease in unemployment very significantly and an increase in productivity also led to a decrease in the rate of inflation and unemployment. The study also concluded that an increase in productivity growth causes a decrease in inflation and also a fall in unemployment.

Fei & Qianyi (2013) investigated the correlation and causality between the inflation rate and the unemployment rate for the period 1978 to 2011. Surprisingly, an empirical proven Phillips curve (There is a negative relationship between the unemployment rate and inflation rate) is ineffective to find a causal relationship between inflation and the unemployment rate in China. This paper investigates the correlation of coefficient and causality between the inflation rate and unemployment for the period 1978 to 2011. Surprisingly, the empirically proven Phillips curve is ineffective in finding a causal relationship between the inflation rate and the unemployment rate in China. The complex economic nature of China prejudices the

generalizability of Phillips curves in China. The actual relationship between the inflation rate and unemployment in China is further discussed in this paper. A constructive recommendation for this issue is provided at the end of this paper.

Remittance

Table 2 Summary of empirical findings on remittance inflows

Study	Major findings
Acosta et al. (2008)	An increase in remittance inflows raises the household income which in turn causes a fail in the labor supply. The shrinking labor supply induces higher wages which leads to higher production costs and inflation raises.
Khan & Islam (2013)	There exists unidirectional positive causal relationship from remittances inflows to the inflation.
Iqbal et al. (2013)	Remittances have significantly positive impact on inflation.

Acosta et al. (2008) explained the case of increasing price level when the remittance is high by developing a micro-funded dynamic stochastic general equilibrium (DSGE) model. The transmission mechanism they suggest is that an increase in remittance inflows raises household income, which in turn causes a failure in the labor supply. The shrinking labor supply induces higher wages, which leads to higher production costs and further contraction of the tradable sector. Therefore, both the real exchange rate and the ratio of

tradable to non-tradable output stimulate high spending and resource movement which can potentially generate inflationary pressure.

Khan & Islam (2013) analyzed the impact of remittances on macroeconomic variables such as inflation covering the time period of 1972 to 2010 in Bangladesh. The study has applied Vector Autoregressive (VAR) techniques and the results suggested that there exists a unidirectional positive causal relationship between remittance inflows to inflation. The empirical results found that a one percent increase in remittance inflow increased the inflation rate by 2.48 % in the long run. The relationship is critical over the long haul, yet no relationship is found between them in the short run. The outcomes likewise demonstrated that any shock in the short-run expansion continuously changed in accordance with the long-run balance.

Iqbal et al. (2013) stated that the inflow of foreign remittances in Pakistan has been an important source of foreign exchange while the economy of Pakistan is consumption-oriented, so it is interesting to explore the nexus between remittances and inflation in Pakistan. The study used Johansen co-integration techniques in order to check the long-run behavior of inflation, while to test short-run dynamics, the study used the Vector error correction model by taking the data from 1980 to 2012. The experimental findings show that settlements decidedly affect expansion, hence underlining the need to channel unfamiliar settlements into useful interest to support monetary

development to counter the inflationary effect of settlements in Pakistan.

Narayan, Narayan, and Mishra (2011) in a study evaluating the impact of inflation in the Philippines found that increases in inflation can prompt the sending of more remittances from migrant relatives in the short run. Moreover, the anticipation of remittances during inflationary periods has shown that remittances are not necessarily inflationary. Likewise, the study by Termos, Naufal, and Genc (2013) indicates the effect of remittance outflows on inflation in the remitting countries. The growth of remittance outflows decreases the inflation rate.

Inflation and economic Growth rate

Fisher (1993) has deliberate about the connection between inflation and economic growth entitled "role of macroeconomic factors in growth". In this paper, the dataset comprises several macroeconomic variables, including inflation for 93 countries. The study has applied a simple alternative to mixed regression. The result of the paper has shown that inflation negatively affects growth by reducing investment, and by reducing the rate of productivity growth. Fisher also argues that inflation alters the price mechanisms, which will affect the efficacy of resource provision and hence influence economic growth negatively.

Sarel (1996) used panel data of 87 countries covering the period 1970–1990 and tested for the existence of a threshold effect between inflation and economic growth. They found proof of an underlying breakpoint at a yearly expansion pace of 8%. Underneath that rate, expansion doesn't significantly affect financial development or it might even show a possibly sure effect. Over that level, the impact is negative, genuinely critical, and exceptionally impressive. Disregarding the presence of the limit would considerably inclination the effect of inflation on financial development.

Ghosh & Philip (1998) used a complete data set consisting of 3603 yearly perceptions on genuine per capita GDP development and customer cost expansion, comparing to 145 nations over the time of 1960–1996. Using panel regressions and allowing for a nonlinear specification, the study found a statistically and economically significant negative relationship between inflation and growth, which holds robustly at all, but the lowest inflation rates. A "decision-tree" technique was used and inflation was identified as one of the most important determinants of growth. This study also discovered that short-run growth costs of disinflation are only relevant in the most severe disinflation or when the initial inflation rate is well within the single-digit range. The summary of the findings was that there are two important nonlinearities in the inflation-growth relationship. At very low inflation rates, inflation and economic growth are positively correlated; otherwise, inflation and economic

growth are negatively correlated. Regardless, the relationship is arched, so the decrease in financial development is emphatically corresponded; in any case inflation and monetary development are adversely associated. Nonetheless, the relationship is convex, so the decline in economic growth associated with an increase from ten percent inflation is much larger than that associated with moving from 40 percent to 50 percent inflation.

Boschen & Weise (2003) showed the probability of a large upturn in inflation during a period of either stable or declining inflation, an occurrence that the study term inflation starts in the OECD. The results indicated that three factors tended to lead to these sustained increases in inflation. To start with, high places of genuine GDP development increase the likelihood of an expansion, since that quick development reflects strategy creators' endeavors to take advantage of the short-run Phillips bend, which at last prompts higher expansion by and large. Second, the hole between expansion in the United States and homegrown expansion raises the likelihood of expansion start, since expansion shocks on the planet's biggest economy will generally be disseminated globally. Third, the likelihood of an expansion starting in a specific year is higher on the off chance of an overall political race happening. The clarification of this is that administration arrangements pointed toward impacting electors are more often than not inflationary. Interestingly, oil cost climbs, fixed conversion scale, monetary arrangement, and political

commencement of the public authority don't generally affect the likelihood of an expansion start.

Chuan (2009) estimated the causal interrelationships between inflation and economic growth within a simultaneous equation framework. This study utilized sectional information from 140 nations over the 1970–2005 period. The outcome demonstrated a reciprocal causal connection between development and expansion. It also showed that expansion is unsafe to development while the impact of development on expansion is valuable, In their examination, they assembled the informational collection into top-level salary nations, low-pay nations, and agricultural nations, and the outcome showed that the adverse consequence of expansion in development in low-pay nations is more noteworthy than in non-industrial nations and big-salary nations.

Rice Production

Rice is one of the most important food crops in the world and it ranks second in terms of area and production. It is the staple food for about 50 % of the population in Asia, where 90 % of the world's rice is grown and consumed. Asia's food security depends largely on the irrigated rice fields, which account for more than 75 % of the total rice production (Virk et al., 2004). Rice is a proliferate user of water, consuming half of all fresh water resources. In Asia,17 million half of the irrigated rice area may experience “physical water

scarcity" and 22 million ha may have "economic water scarcity" by 2025 (Tuong and Bouman, 2001). In India, there is a developing interest in rice due to the truly prospering populace. It is assessed that rice interest in 2010 will be 100 million tones. To assure food security in the rice-consuming countries of the world, rice production would have to be increased by 50 percent in these countries by 2025 and, this additional yield will have to be produced on less land with less usage of water, labor and chemicals (Zeng et al., 2004). Since rice is important for Nepaleses, it covers a significant amount of the consumer price index. Hence, this variable has been included. In an article Mitra & Chattopadhyay (2018) The nexus between rice production, price inflation, and monsoon rainfall in India indicates that there are chances of high inflation for rice just after monsoon months due to a decline in rice production as a result of inadequate rain fall and these findings can be very useful for policy-makers.

In another article, Yatsenko, H. (2020) discovers the influence of weather environments on core agriculture areas of the Ukrainian economy and the complex index of inflation in Ukraine. The gained results show that fluctuations in the air temperature, rain and precipitation are major elements of output in different sectors (specifically agriculture,) and rice production in an article Blagrave (2020) found out Co-movement (synchronicity) in inflation among emerging and developing countries in Asia is partly due to the impact of monsoon rainfall. Harold Glenn Valera, Jean Balié & E Magrini (2021) suggest that the effect of rice production and prices on

inflation is larger than the effect of fuel prices and remittances, because it is an important part of domestic consumption. The results obtained are robust to various model specifications, different sub-periods, and inflation proxies. Their study concludes that production impacts prices, and prices influence inflation

Foreign exchange rate

Table 3 Summary of empirical findings on foreign exchange rate

Study	Major findings
Mosayeb & Mohammad (2009)	Exchange rate, liquidity, the rate of expected inflation and the rate of imported inflation had significant effects on the inflation rate in the short run.
Ali & Mim (2011)	Effective exchange rates and world inflation produce a significant and positive effect on inflation.
Sek et al. (2012)	There is significant correlation between exchange rate and inflation.

Mosayeb & Mohammad (2009) analyzed the major determinants of inflation in Iran using annual time series data from 1971 to 2006 by applying the ARDL approach. An empirical model has been constructed by considering the special characteristics of Iran's economy and recent studies in the context of inflation. The study emphasizes the effect of liquidity, the exchange rate, GDP, the expected rate of inflation, and imported inflation along with the dummy variable presenting the effect of the Iran/Iraq war on Iraq's

economy. The observational outcomes showed that in the lengthy run, the fundamental determinants of expansion in Iran are the liquidity, conversion scale, the pace of anticipated expansion, and the pace of imported expansion. This large number of factors altogether affected the expansion rate in the short run. Additionally, the damaging eight-year battle with Iraq decidedly affected the expansion rate in the Iranian economy. Ali & Mim (2011) studied the impact of monetary and non-monetary determinants of inflation for a sample of 8 MINA countries over the period 1980-2009. The review did different model assessments to inspect the effect of five standard variable gatherings on expansion to be specific underlying, business-cycle-related, transparency related, outer and financial factors. The exact discoveries affirmed the presence of solid proof for a persevering expansion dynamic as slacked expansion created a significant and huge beneficial outcome for the present expansion. Additionally, world expansion and ostensible viable trade rates produce a huge and positive outcome on expansion. The concentrate likewise reports an adverse consequence of result hole on expansion, which recommends that an expansion in the resulting hole discharges strain on the stockpile side and debilitated expansion. The most critical and significant impact is the one delivered by government spending. Shockingly, this impact has generally been negative and huge for every one of the relapses. A focal finding of this study is that the impact created by the result hole mirrors the impacts of financial and money-related arrangements on expansion. This suggests, that a lessening in government spending over an extensive

stretch ought to upgrade development, decrease the resulting hole and create an expansion, while an expansion in cash supply ought to deliver expansion by improving development and diminishing the resulting hole.

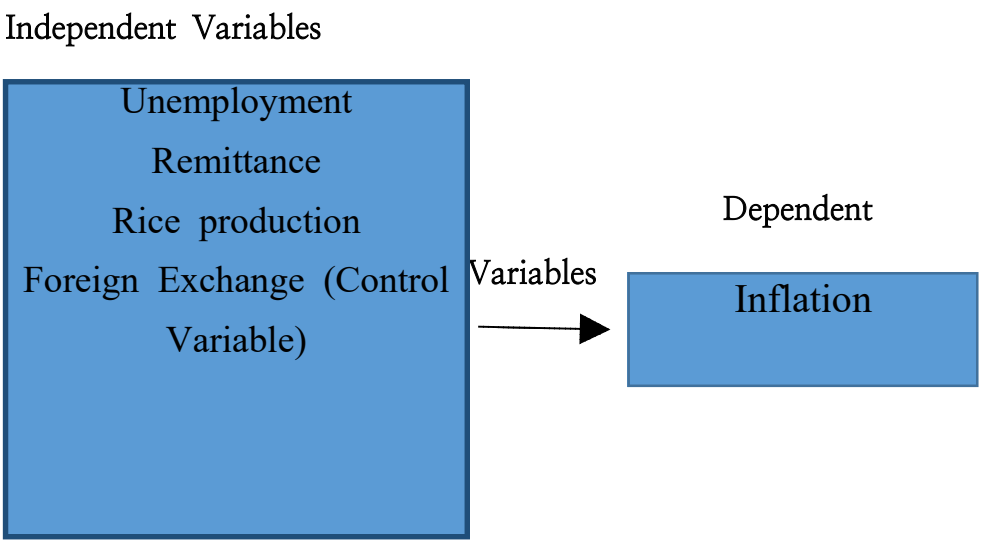
Sek et al. (2012) examined the empirical investigation into the relationship between exchange rates and inflation-targeting regimes in three developed countries and three emerging Asian economies that have adopted inflation-targeting regimes. This study applied a multivariate GARCH model, and the results revealed a significant correlation between exchange rates and inflation. The inflation-targeting regime also has significant impacts on movements of inflation. The inflation-targeting regime is associated with higher volatility in exchange rate movement and it is very volatile in emerging Asia compared to the developed economies. The implementation of inflation targeting does not lead to the trade-off of inflation in Asia, but the trade-off relationship is detected in developed economies. The study concluded that the inflation-targeting regime is effectively used to lower the inflation rate and boost the emerging economies in Asia compared to the developed countries.

Inyiama & Ekwe (2014) examined the nature and impact of exchange rate fluctuations on inflationary pressure and other selected macroeconomic indices in Nigeria by taking data from 1979 to 2010. This study applied the ordinary least squares method to evaluate

their relationship and impact. The result revealed that the exchange rate and the inflationary rate are positively related, although the relationship is not very significant. This signified that fluctuations in exchange rates can result in changes in the inflationary rate. The study also concluded that interest rates and GDP growth rates have no significant impact on the exchange rate in Nigeria. However, both have a negative relationship with the exchange rates.

Imimole and Enoma (2011) concentrated on the effect of conversion standard deterioration of expansion in Nigeria for the period 1986-2008 by utilizing auto backward conveyed slack co-combination methodology. This investigation discovered that swapping scale deterioration, cash supply, and GDP development rate are the fundamental determinants of expansion in Nigeria, and that conversion standard devaluation has for some time a positive and massive impact on expansion. This suggests that conversion-scale devaluation can achieve an expansion in expansion in Nigeria. The investigation likewise discovered that the inflationary rate in Nigeria makes a slacked aggregate difference. Thus, inferred that, in spite of the fact that the Naira devaluation is applicable in guaranteeing an improvement in the development of exportable products, it should not be depended upon as an intense measure for controlling expansion in Nigeria.

Conceptual framework



2.3 Study Hypothesis

Rice production:

A study by Gairhe Gauchan and Timsina (2021) indicates that Nepal is importing rice on an increasing trend and the country is not being able to meet national demands despite some increase in rice production and productivity in the last decade and this reality has a significant impact on different economic indicators such as economic growth and consumer price index. Moreover, the consumer price index is related to inflation.

H1: Rice production has significantly adverse effect on Inflation.

Unemployment:

Unemployment is the condition in the economy when the supply of labor hits the petition of labor in the labor market of the economy. Simply, unemployment happens when a person searching for work is unable to find work. The number of unemployed people is isolated by the number of people in the labor force. It has remained one of the challenges for developing countries to sustain low inflation at a low unemployment rate. The curve suggests a negative relationship between the rate of inflation and unemployment (Phillips,1958). There are three assumptions of the Phillips curve. First, in the short run, there is an interchange between inflation and unemployment. Second, collective supply shock can break the concept of the Phillips curve, which is also known as stagflation. Third, in the long run, there is no noteworthy interchange between inflation and unemployment. Gomme (1993) studied the relationship between inflation and employment. The study discovered that a rise in inflation reduces the minimal value of today's last unit of consumption, thus persuading people to work less. With less labor, the minimal product of capital is lastingly reduced, resulting in a slower rate of capital buildup. This study also found that reducing the temperate inflation rate results in a very small gain in the growth of output.

Bhutto (2011) expected to recognize the connection between inflation and unemployment in SAARC countries from the viewpoint of the

Phillips Curve. Unbalance annual panel data of eight SAARC members (Nepal, Afghanistan, Bangladesh, Bhutan, India, Maldives, Pakistan, and Sri Lanka) and six expected members of SAARC (China, Russia, Indonesia, Iran, Myanmar, and South Africa) has been used for the period 1980-2010. This paper has found that there is an adverse relationship between inflation and the unemployment rate in the SAARC countries. That means the concept of the Phillips curve holds true.

H2: Unemployment rate has insignificant effect on inflation

Remittance

A remittance is money or its equivalent sent from one place to another. Nath & Silva (2012) applied the VAR model to the monthly data of Mexico to investigate the effect of remittances on the prices of goods and services. In the study, findings indicate that remittances rise in the long run, which increases the prices of many consumer items, hence also increasing inflation (Nath & Silva, 2012). Mughal (2012) examined the role of remittance as a growth strategy in the case of Pakistan and found that remittance has an effect on increasing demand-pull inflation. In a study, Rodrik (2007) provided evidence that a rise in remittance inflows leads to an underestimation of long-term economic growth through the overvaluation of the real exchange rate, which can potentially cause inflationary pressure.

H3: Remittance has significant effect on inflation.

Foreign exchange rate (Control Variable)

Changes in exchange rates have great consequences for the economy as a whole. Exchange rate fluctuations strongly influence the level of prices through aggregate demand and aggregate supply in the system of floating exchange rates. The failure of the exchange rate will cause the price of inputs to be costlier, thus causative to a higher cost of production. Constructors will undoubtedly raise the cost of the price of goods that will be paid by consumers. As a result, the collective price level in the country rises or if it continues it will cause inflation. Adetiloye (2010) adopted the technique of correlation and found the consequence relationship between consumer price indexes and the exchange rate in Nigeria. Khattak & Tariq (2012) revealed that real exchange rate depreciation raised inflation in Pakistan.

H4: Foreign exchange rate has positive relationship with Nepalese inflation

Concluding remarks

The review of the available literature has contributed to enhancing the fundamental understanding and knowledge, which is required to make the study meaningful and purposeful. These studies have attempted to examine the determinants of inflation in the Nepalese

economy. This is one of the important macroeconomic variables, because if inflation is not maintained properly, then the whole economy will be damaged. Inflation is always and everywhere a monetary phenomenon and it is an interestingly touchy issue in macroeconomics (Friedman & Schwartz, 1970).

Inflation is significantly explained by several variables and researchers in various ways. Among them, Ghosh & Philip (1998) postulates, that at very low inflation rates, inflation and economic growth are positively correlated; otherwise, they are negatively correlated. Friedmen (1968) found that inflation is the function of money supply and real output. Abizadeh (1986) found a positive relationship between the budget deficit and inflation. But Meltzer (1989) does not support that view in most developed countries. Bhutto et al. (2011) revealed a negative relationship between inflation and the unemployment rate, whereas Karanassou & Sala (2010) showed that an increase in productivity growth causes a decrease in inflation and also a fall in unemployment. Acosta et al. (2008) observed remittance inflows and rising inflation in the economies. The same result is obtained by Iqbal et al. (2013).

There are many national and international studies in the field of determinants of inflation. These studies have attempted to determine the factors that influence the inflation of the economy. The reviewed literature shows that there is no uniformity in the findings. Studying performed in foreign countries taking some variables may not be valid

in Nepal due to the different general environment, economic and political contexts. Thus, the empirical results found in other countries cannot be generalized in the context of Nepal.

In Nepal, a separate study is required considering only those variables that seem to be relevant according to the environmental context. However, in the context of Nepal, only a few efforts have been made to examine the issues related to factors that affect inflation. Many graduate students are showing interest in this topic. Specifically, the study is primarily designed to fill the gap between similar studies in the Nepalese context. This study has attempted to carry out it distinctly from other previous studies in terms of sample size and the research methodology used. This study has covered the data for 30 years. Thus, it is believed that this study is different from earlier studies in the Nepalese context. The importance of this study may be viewed from its contribution to filling the gap between previous studies and the finding of this study can add value to the existing body of literature.

Chapter III

Research Methodology

Research methodology refers to the various methods of practices applied throughout the study. This helps to solve the research problem in a systematic way. The clear and well-described research methodology ensures the valid analysis and interpretation of the data under study. This chapter has focused on the research design, population, sample of the study, nature, and sources of secondary data. It also discusses the sampling technique and the data collection method and procedures along with the time frame. Further, this chapter specifies the major statistical tools and models used to examine the relationship between the variables of interest. The methods employed for data analysis techniques and details of the overall analysis plan have also been dealt with.

3.1 Research design

This study employed descriptive and causal-comparative research designs to deal with the fundamental issues associated with determinants of inflation. The descriptive research design has been adopted for fact-finding and searching for adequate information about factors affecting inflation. Besides this, an effort has also been made to describe the nature of panel data of the macroeconomic variables consisting of 120 observations from the fiscal year 1990 to 2020 by

using descriptive statistics with respect to key economic variables such as foreign exchange rate, unemployment, rice production, and Remittance inflows, on inflation. This study is also based on casual comparatives of different independent variables and dependent variables. This has ascertained and understood the magnitudes and directions of the observed relationship between consumer price indexes, a measure of inflation, and corresponding variables.

Description of sample

The data is collected from multiple sources of secondary data to determine the variables that affect the inflation of the Nepalese economy. This study collected the economic data for the analysis from the World Bank, Economic Bulletin published by Nepal Rastra Bank (NRB), economic and financial websites, International Monetary Fund (IMF), Central Bureau of Statistics Nepal, Asian Development Bank (ADB) and other Nepalese journals of economics and Business that we have taken for the sample. All the secondary data is compiled, processed, and tabulated in the time series as per the need to fulfill the objectives. The data consists of economic data of key economic variables during the sample period of 1990 to 2020, a converging period of 30 years. There are many economic variables that influence the Nepalese economy, however, only four variables are taken into consideration to analyze the determinants of inflation.

3.2 Description of sample

This table shows the sample of ten key economic variables of Nepal whose respective data are collected within the time period from 1990 to 2020 which make 120 observations in order to analyze the determinants of inflation.

Table 4 Macroeconomic variables selected for the study

Thus, the study is based on 120 observations.

S.N	Variables	Symbol	Study period
1.	Inflation Rate	IFR	1990–2020 (30 years)
2.	Rice Production	RP	
3.	Remittance	RT	
4.	Unemployment rate	UR	
5.	Foreign Exchange Rate (control Variable)	FX	

Measurements of variables

Inflation: In Nepal, there are three main price directories for inflation, namely the CPI, the WPI, the Salary, and Wage Rate Index. The foremost attention for assessing the cost of living is placed on CPI. This is because CPI measures inflation impact which is the final measure of prices in households. (NRB,2021). In this study, the inflation rate was considered CPI

Rice production: Nepal's economic growth depends upon rice production. As per the Fiscal Year 2020/2021, rice was grown on 1.47 million hectares of land with a production of 5.621 million metric tons. Hence, in this study, annual rice production has been considered in metric tons

Unemployment: The rate is a percentage that is calculated by dividing the number of unemployed persons by the number of persons currently employed in the workforce.(in percentage)

Remittance: The World Bank provides annual estimates of remittance flows globally (and bilaterally), based on the national balance of payment statistics produced by central Banks and compiled by the IMF. In this study, data provided by the World Bank on remittance flow in Nepal has been used in millions of rupees

Exchange Rate: Official exchange rate refers to the exchange rate set on by national authorities or to the rate set in the legally accredit exchange market. It is calculated as an annual average based on monthly averages (local currency units relative to the U.S. dollar).

Model Specification

$IFR_t = a + \beta_1 RP_t + \beta_2 RT_t + \beta_3 UR_t + \beta_4 FX_t + e$ ……. (I)

Where, IFR indicates dependent variable inflation Rate and independent variables are specified as:

- a = Constant
- B_1, β_2, β_3, β_4(coefficients of respective variables)
- IFR= Inflation Rate (In Percentage)
- RP= Rice production (in Tons)
- RT = Remittance (in Million Rupees)
- UR = Unemployment rate (Measurement= Percentage)
- FX= Control variable: Foreign exchange (In USD)
- e = Error term

3.3 Method of analysis

This section deals with statistical methods used for the purpose of analyzing secondary data. The methods of the data analysis used in the study have been divided into two subsections. The first section deals with the methods of secondary data analysis. This includes descriptive statistics, correlation analysis, and least square regression analysis. The second section describes different statistical tests of significance for validation of the model, such as t-test, p-value, F-test, and R2.

This review has utilized t-measurement to perform an important trial of relapse coefficients. In the language of importance test, a relapse coefficient is supposed to be measurably huge if the basic p-worth of test measurement is not exactly the degree of importance indicated. In other words, the statistical significance of the coefficients validates the explanatory power of the associated independent variables. The level of significance specified in this study is one and five percent.

Besides the statistical test of the significance of individual regression coefficients, it is necessary to test the joint hypothesis that all regression coefficients are simultaneously significant. This is called the test of the overall significance of the model. This can be done by using the coefficient of determination (R2) and F-statistics. The

adjusted coefficient of determination has been used to identify the percentage of the total variation independent variable that has been explained jointly by all explanatory variables. The statistical significance test of this joint explanatory power was conducted using F-statistic. The p-value of the F-test was examined to confirm whether the regression models were significant at one and five percent levels.

Furthermore, Exploratory Data Analysis (EDA) of data was performed to analyze the dependency, homogeneity, and data distribution. Meanwhile, the original data was transformed to normalize the data and check homoscedasticity and linearity. Secondary data was analyzed by using the R programming language with log in order to derive the meaningful relationship among the dependent and independent variables.

3.4 Analysis plan

This section discusses how analysis has been carried out in chapter 4. It is necessary to follow certain steps and procedures in analyzing data in order to understand the results and generalize the findings. The analysis of secondary data intends to study the relationship and cause and effect between the variables. The analysis starts with the analysis of secondary data. This section is divided into various subsections, the first of which deals with the descriptive statistics of the sample observations, including the mean, median, standard

deviation, minimum and maximum values of observations. Correlation analysis has been carried out in the second section followed by step-wise regression analysis. Test of significance, multicollinearity, and autocorrelation has also been tested to make the results more valid. All observed relationships and findings have been interpreted to derive meaningful conclusions regarding variables with inflation.

Chapter IV

Presentation and Analysis of data

Data analysis is the process of developing answers to questions through the examination and interpretation of data. The essential strides in the logical cycle comprise of recognizing issues, deciding the accessibility of reasonable information, settling on which strategies are proper for addressing the inquiries of interest, applying the techniques, and assessing, summing up, and imparting the outcomes. The chapter provides a systematic presentation and analysis of the data to deal with various issues associated with inflation in the Nepalese economy.

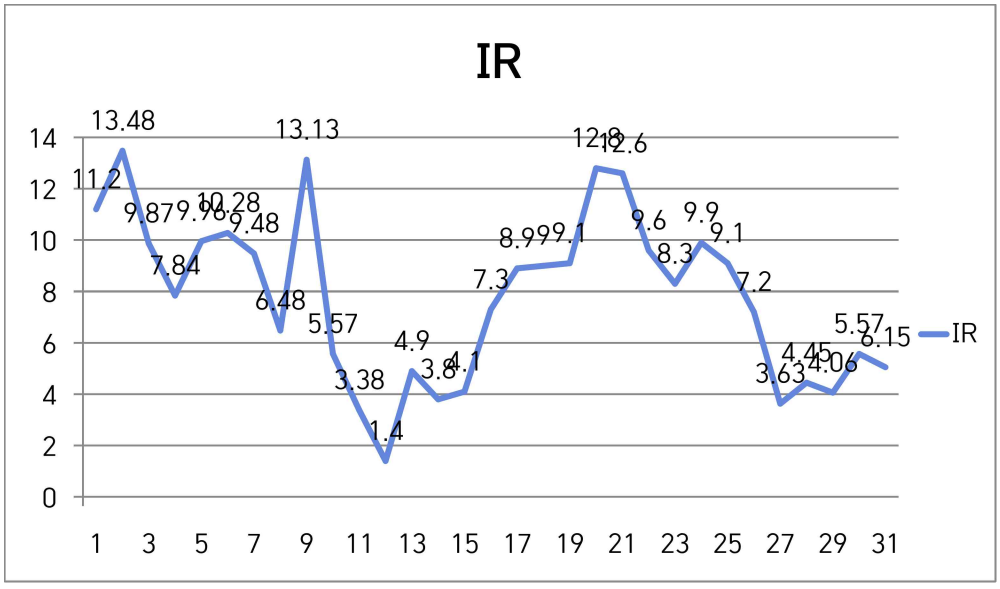
This chapter deals with the results of the study, which include descriptive statistics of variables, correlation results for dependent variables and explanatory variables, diagnosis tests for the regression models, and regression analysis for CPI inflation. Secondary data analysis was done by using SPSS software. This chapter presents the analysis and findings of the study and sets out the research methodology. The results for all these equations are divided into three types: descriptive results, correlation results, and those obtained from the regression analysis.

4.1 Structure and pattern of variables

This section deals with the structure and movement of dependent and independent variables considered in this study. Dependent variables (CPI inflation and WPI inflation) are used to establish the relationship between GDP growth rate, broad money supply, foreign exchange rate, market interest rate, budget deficit, unemployment, Indian inflation, and remittance inflow.

Figure 1: Structure and pattern of CPI inflation

The observed values of CPI inflation are presented in Figure 1



Source: Nepal Rastra Bank

Figure 1 shows the CPI inflation (in percentage) of Nepalese economy from the 1990-2020. The CPI inflation is highest in the

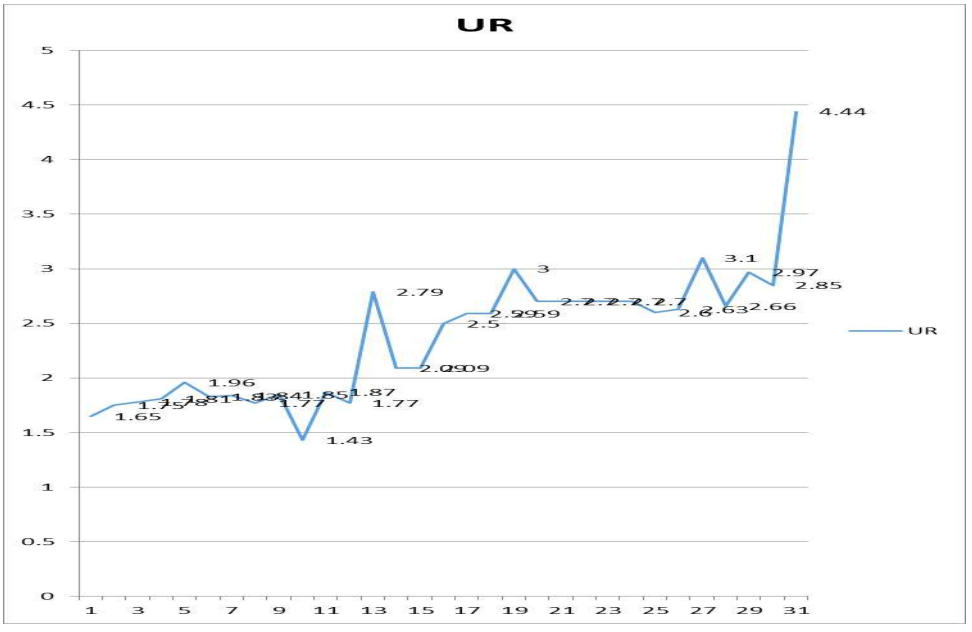
year 1991 (13.6%), 2009 and 2010 (12.8 and 12.6% respectively) and lowest in the year 2001 (1.4 %). In the years 2010 and 2011, the CPI inflation is constant at 9.6 percent. Furthermore, CPI inflation declined in 2016 and from then it is raising trend. Covid crisis has increased to 6.15% in 2020.

Figure 2: Structure and pattern of unemployment rate

The observed values of unemployment rate in Nepalese economy are presented in Figure 2

This Figure shows the structure of unemployment rate (in percent) from *1990 to 2020*

(In percentage)



Source: Central Bureau of Statistics, Nepal

Year	Unemployment rate	Year	Unemployment rate
1997	1.77	2009	2.70
1998	1.85	2010	2.70
1999	1.43	2011	2.70
2000	1.87	2012	2.70
2001	8.80	2013	2.70
2002	2.79	2014	2.60
2003	2.09	2015	2.60
2004	2.09	2016	3.1
2005	2.50	2017	2.66
2006	2.59	2018	2.97
2007	2.59	2019	2.85
2008	3.00	2020	4.4

Table 5 shows the unemployment rate (in percentage) in Nepalese economy from the year 2001 to 2015. Unemployment rate is highest in the year 2001 (8.80 percent) and lowest in the year 2005 (2.50 percent). In the years 2002 and 2003, the unemployment rate is constant having 2.09 percent. Similarly, it is same in the years 2006 and 2007 with the value 2.59 percent. Likewise, its value remains unchanged for the years 2009, 2010, 2011, 2012 and 2013. Furthermore, its values for the years 2002, 2005 and 2008 are 2.79 percent, 2.50 percent and 3.00 percent respectively. During the Covid crisis unemployment level increased to 4.4 %. This show covid-crisis reduced employment opportunities in Nepalese economy.

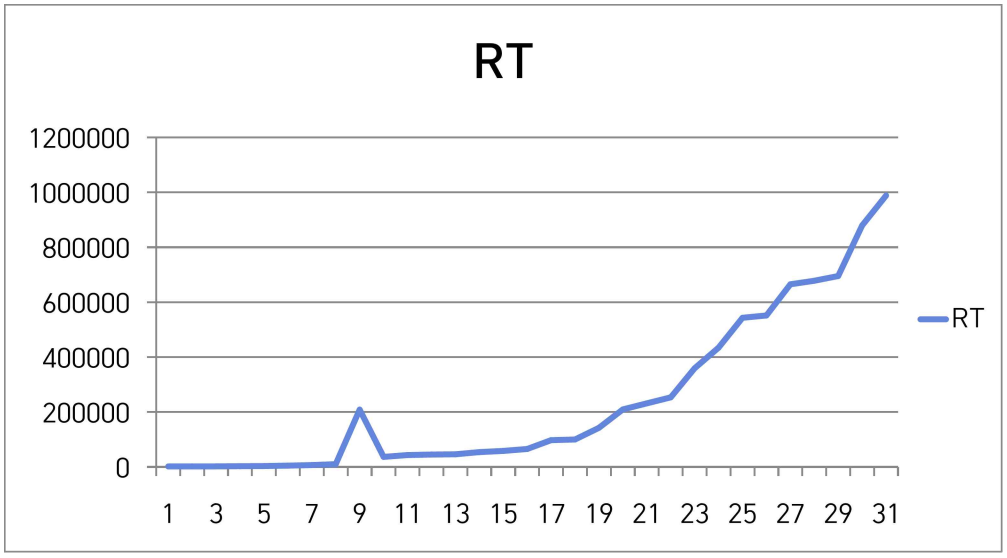
Figure 3: Structure and pattern of remittance

The observed values of remittances of Nepalese economy are presented in Figure 3

Table 6 Structure and pattern of remittances

This figure 3 shows the structure of remittance (in million rupees) from *1990 to 2020. These are worker's remittances inflow to Nepalese economy.*

(In million rupees)



Source: Nepal Rastra Bank

Figure 3 shows the trend of remittance inflows in Nepalese economy ranging from 1990 to 2021. The horizontal axis (X-axis) represents the time duration and vertical axis (Y-axis) represents the remittance in million rupees. First, remittance has increased continuously from 2001 to 2021. After that it has increased sharply up to 2016 and reaches highest point in 2020. After 2001, remittance has become the backbone of Nepalese economy. Hence, remmitance amount after 2001 has be tabulated bellow: Before 2001 contribution of remittance on Nepalese economy appears as insignificant

Remittances

(In million rupees)

Source: Nepal Rastra Bank

Year	Remittances	Year	Remittances
2001	45309.50	2009	209698.50
2002	46300.34	2010	231725.30
2003	54203.30	2011	253551.60
2004	58587.60	2012	359554.40
2005	65541.20	2013	434581.70
2006	97688.50	2014	543294.10
2007	100144.80	2015	551742.20
2008	142682.70	2016	665233.20
		2017	678123.44
		2018	695334.26
		2019	879445.33
		2020	**988344.20**

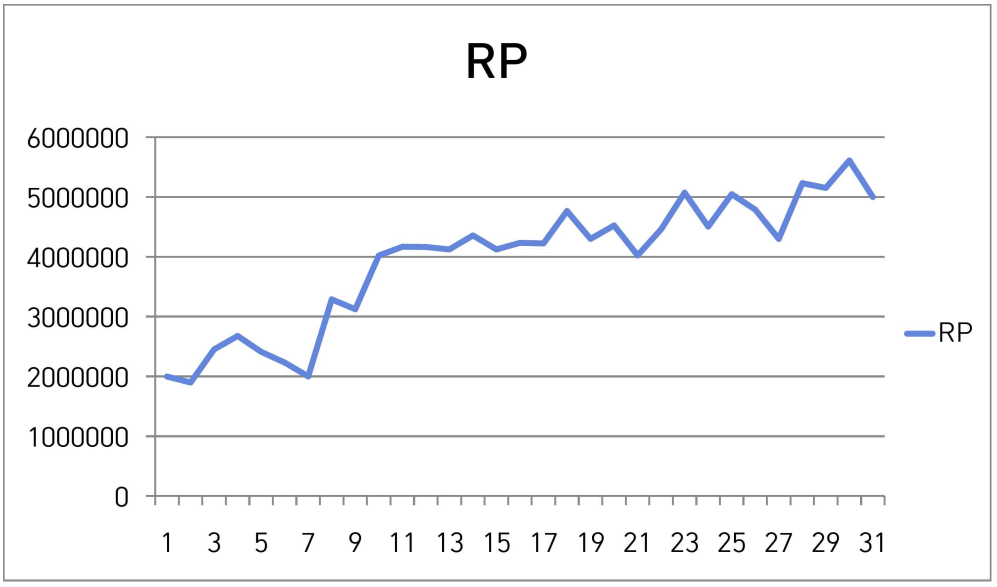
Figure 4: Structure and pattern of Rice Production

Annual rice production has been considered in metric tons

As indicated by the table 7, rice production in Nepal has gradually increased after 1999/2000, this also indicates modernization in agriculture in Nepalese context and this has significantly contributed to rice production

Year	Annual Rice Production	Year	Annual Rice Production
1990	1998212	2003	4356678
1991	1898821	2004	4123457
1992	2451221	2005	4233453
1993	2677121	2006	4223432
1994	2412332	2007	4765674
1995	2231992	2008	4299264
1996	2001231	2009	4523693
1997	3288123	2010	4023823
1998	3123311	2011	4460278
1999	4021221	2012	5072248
2000	4167212	2013	4504503
2001	4164123	2014	5047047
2002	4123675	2015	4788612
		2016	4299079
		2017	5230327
		2018	5151925
		2019	5610011
		2020	4998777

Trend regarding production of Rice in Nepal



As the figure 4 indicates there is a trend of increase in rice production in Nepal

Structure and pattern of foreign exchange rate

The observed values of foreign exchange rate are presented in table 8

Table 8 Structure and pattern of foreign exchange rate

This table shows the structure of foreign exchange rate from 1990 to 2020. The foreign exchange rate is taken as exchange rate of Nepalese currency with US dollar. These rates are the buying rates of US dollar during average of time periods.

Year	Foreign Exchange Rate	Year	Exchange Rate
1990	29.36	2003	77.49
1991	37.33	2004	73.49
1992	42.71	2005	71.76
1993	48.60	2006	72.03
1994	49.39	2007	70.20
1995	51.89	2008	64.72
1996	56.45	2009	76.58
1997	58.01	2010	74.24
1998	65.33	2011	72.07
1999	68.23	2012	80.72
2000	69.34	2013	87.66
2001	73.48	2014	97.95
2002	76.53	2015	99.19
		2016	107.4
		2017	104.5
		2018	108.9
		2019	112.6
		2020	118.3

Source: NRB, Quarterly Bulletin, 2021

Table 8 shows the exchange rate of Nepalese currency with US dollar from the year 1990 to 2020. The exchange rate is highest in the year 2020 (118.3 rupees) and lowest in the year 1990 this shows the value of US dollar for Nepalese currency is on the increasing trend after 1990.Hence, rising US dollar significantly contributes to inflation as indicated in Regression Table

4.2 Descriptive Statistics

Table 9 shows descriptive statistics-mean, standard deviation, minimum and maximum values of economic variables with 120

observations from the period 1990 to 2020.

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Inflation Rate	30	1.4	13.48	7.79	3.24
Rice Production	30	1898821	5610011	3944222	1072592
Remittance	30	2012.22	988344.2	239538.5	290918.8
Unemployment rate	30	1.43	4.44	2.38	0.617

4.3 Correlation analysis

The Pearson correlation coefficients have been computed and the results are presented in table 10 Correlation is a term that refers to the strength of a relationship between two variables.

Table 10 Correlation matrix for dependent and independent variables

Table 4.3 shows the correlation analysis of dependent and independent variables under study from the period 1990 to 2020. The model is $IFR_t = a + \beta_1 RP_t + \beta_2 RT_t + \beta_3 UR_t + \beta_4 FX_t + e$ *where, IFR(Inflation Rate) is the dependent variable. The independent variables is RP (Rice production), RT (Remittance), UR (Unemployment rate), FX (Controlvariable: Foreign exchange).*

4.4 Multi Regression Analyses

	IR	RT	UR	RP	FX
IR	1				
RT	.850*	1			
UR	.180	.030	1		
RP	.688*	.026	.233	1	
FX	.425*	.483*	.136	.044	1

Note: *Notes: The asterisk signs (*) indicate that the results are significant at 5 percent level*

The result shows that remittance positively correlated to Inflation rate. It indicates that increase in remittance stimulates the Inflation rate. Likewise, Unemployment rate positively correlated to inflation rate. It indicates that increase in unemployment rate drives the inflation rate. Similarly, Rice production positively correlated to inflation rate. It means that rice production stimulates the inflation rate. The result also shows that foreign exchange positively correlated to inflation rate. It indicates that foreign exchange rate drives the inflation rate.

Table 4.4 presents regression result of CPI inflation with other variables; foreign exchange rate, unemployment rate, annual rice production and remittance. The regression of CPI inflation on annual rice production rate shows that beta coefficient for is positive. The result hence indicates that higher rice production annually higher will be the CPI inflation. This accepts our prior hypothesis. The regression on remittance reveals that the beta coefficient is positively significant for all equations. It thus represents that greater remittance higher will be the CPI inflation.

〈 M o d e l 〉

summary(lm(log(IFR)~log(RP)+log(RT)+log(UR)+(FX),data=sam.dta new30)

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Min	1Q	Median	3Q	Max
-0.59233	-0.22790	0.03287	0.17469	0.49063

Coefficients:

	Estimate	Std. Error	t value	Pr(>|t|)	Remark
(Intercept)	27.849897	4.894733	5.690	5.50e-06 ***	
log(RP)	-1.918825	0.358146	-5.358	1.31e-05 ***	Significant
log(RT)	0.382334	0.079249	4.824	5.34e-05 ***	Significant
log(UR)	0.392903	0.331130	1.187	0.24613	Insignificant
log(FX)	-0.019278	0.005689	-3.389	0.00225 **	Significant

Residual standard error: 0.2723 on 26 degrees of freedom

Multiple R-squared: 0.6621, Adjusted R-squared: 0.6101

F-statistic: 12.74 on 4 and 26 DF, p-value: 7.196e-06

The above table shows the result of regression analysis of dependent, independent and control variable which are Inflation rate, Rice Production, Remittance, Unemployement rate and foreign exchange rate of Nepal. The adjusted R-Squared value is 0.6101,it specify that 61.01% of the variation in the output variables are explained by the input variables. The result indicates that this is appropriate model with R-squared value is 0.000007196. If the P-value is less than the significance level (0.05), the decision is to reject the null- hypothesis.

According to the result of regression analysis, Rice Production has significantly adverse effect on inflation with Pr-value 0.0000131***, it shows that inflation decreased by 1.91% while rice production goes up by 1 ton. Remittance and Inflation has positive relationship and significant level has 3 star with Pr-value 5.34e-05***, where 1 rupee increase in remittance makes inflation increased by 0.38%. Similarly, UR and inflation rate have insignificant relation with Pr-value 0.24613, which means 1% increase in UR makes 0.39 % increase in inflation rate. Lastly, Foreign Exchange rate has significantly adverse effect on inflation rate with Pr-value 0.00225, it examines that inflation rate gets decreased by 0.019% while

exchange rate goes up by 1 rupee in US Dollar(NRS+1)/USD

On a money's worth and unfamiliar conversion scale, Inflation is bound to make a huge negative difference, instead of a critical constructive outcome. An exceptionally low pace of expansion doesn't ensure a good swapping scale for a nation, yet an incredibly high expansion rate is probably going to impact the nation's trade rates with different countries adversely. Therefore, we can say if exchange rate increases+ then inflation decrease − and vice versa.

Balderas and Nath (2008) studied Mexico using monthly data from 1995− to 2005, which differs from the above study. This study found that remittances have significant positive effects on inflation in the short run, which gradually tapers off in the long run, as different exchange rate regimes have considerably different effects on macroeconomic variables. However, as the regression analysis indicates and also shown by trend lines, Remittance has constantly, increased in the Nepalese context for the last 20 years. Overall, regression analysis remains consistent with a multitude of factors (Paudyal, 2014) studied to understand explanatory factors associated with inflation in the Nepalese context.

Chapter V

Summary and Conclusion

5.1 Summary

This study is about the determinants of inflation in the Nepalese economy. In this chapter, a summary, conclusion, and recommendation are included. All summaries and conclusions are made according to the results obtained from the analysis. A Recommendation has been made which is beneficial for economists and the central bank to maintain the inflation of the country.

Inflation is a sustained increase in the general price level of goods and services in an economy over a period of time. Inflation affects the economy in both positive and negative ways. Adverse consequences of inflation remember an increment in the open door cost of holding cash and vulnerability to future inflation, which might put speculation and investment funds down. Beneficial outcomes incorporate lessening the genuine weight of public and private obligations, keeping ostensible loan fees over zero of national banks can change financing costs to settle the economy and decrease joblessness. Inflation is affected by many factors, such as the unemployment rate, rice production, and remittance inflows.

The major objective of this study is to analyze the determinants of inflation in the Nepalese economy. However; the specific objectives of the study are to analyze the impacts of annual rice production, remittance and unemployment rate on the consumer price index as a measure of inflation. Fisher (1993) found that inflation negatively affects economic growth by reducing investment and by reducing the rate of productivity growth. Sarel (1996) observed that inflation below 8%, inflation does not have a significant effect on economic growth or it may even show a marginally positive impact. Above that level, the effect is negative, statistically significant, and very strong. Friedmen (1968) revealed that inflation is the function of money supply and real output.

Bhutto et al. (2011) observed a negative relationship between inflation and the unemployment rate in the SAARC countries. This finding is also congruent with this study as well. The data analysis of this study also indicates that the unemployment rate has an insignificant influence on the inflation rate. Acosta et al. (2008) found an increase in remittance inflows raises household income, which in turn causes a failure in the labor supply. The shrinking labor supply induces higher wages, which leads to higher production costs and increased inflation. Similarly, this study also shows that remittance flow increases inflation.

As indicated in data analysis, only remittance has a positive and significant relationship with inflation, which means an increase in remittance also increases inflation. This finding is consistent with Mughal (2012) that inflation increases because of workers' remittances in the case of the Pakistani economy. And, the same thing can be observed in the Nepalese economy as well. As Hassan and Shakur (2016) conducted a similar study in Bangladesh concluded the long-term and short-term impacts of inflation due to workers' remittances, specifically in developing economies. Hence, in this study, similar phenomena regarding the relationship between inflation and remittance have been observed.

Reinhart and Rogoff (2004) show that an increase in remittance inflows causes a transfer of resources from the tradable to the non-tradable sector, which generates a rise in the price level. Hence, in this study, we can observe that remittance increases inflation.

Rodrik (2007) provides evidence that a rise in remittance inflows leads to an underestimation of long-term economic growth through the overvaluation of the real exchange rate, which can potentially cause inflationary pressure. This is particularly evident for developing economies, where the production of tradable goods suffers from market failures and weak institutions. In the Nepalese context, similar economic realities have manifested, remittance has spurred economic growth but also inflation

Khan & Islam (2013) verified how remittance inflows affected the inflation rate in Bangladesh for the 1972–2010 time period by applying vector autoregressive (VAR) techniques. Their empirical results conclude that a 1 % increase in remittance inflows leads to a rise in inflation by 2.48 % in the long run, whereas no significant relationship is evident between these two variables in the short-run. Similarly, the beta-coefficient of this study also indicates that remittance increases inflation.

In this study, this also determined that rice products increase inflation. It is because many farmers derive much of their income from producing food, the changes in food prices will have large effects on the welfare of both farmers and their spending capacities (De Hoyos and Medvedev, 2009). However, with production, food prices have to be kept under control, as the study by Shrestha and Chaudhary. (2012) suggest that a 10 percent rise in food prices is likely to increase overall poverty in Nepal by 4 percentage points. This implies that a one percent rise in food inflation will push 100 thousand additional people into overall poverty and 180 thousand additional people into food poverty.

On a cash's worth and unfamiliar conversion scale, Inflation is bound to make a huge negative difference, as opposed to a critical constructive outcome. An exceptionally low pace of inflation doesn't ensure a great swapping scale for a nation, and an incredibly high

inflation rate is probably going to impact the nation's trade rates with different countries adversely. Therefore, we can say that the exchange rate increases+ then inflation decreases – and vice versa. Khan (2010) stated that increases in interest rates have an effect on exchange rates due to which the home country's currency value decreases and exchange rates increase. Ebiringa and Anyaogu (2014) stated that the interest rate and exchange rate have a negative association.

In assessing the effect of inflation in the Philippines, he found that expansions in inflation can incite the sending of more remittances from migrant relatives in the short run. More than expected remittances during inflationary periods, it has shown that remittances are not really inflationary. (Paolo, Rivera & Tereso,2020). However, in the Nepalese context, inflation has a positive relation to inflation

Hassler & Neugart (2003) found that the Phillips curve is linear and it is statistically significant. There is a trade-off between inflation and unemployment. Similarly, this study also indicates a tradeoff between unemployment and inflation, when unemployment increases, inflation. Fei & Qianyi (2013) investigated the correlation and causality between the inflation rate and the unemployment rate for the period 1978 to 2011. Surprisingly, an empirical proven Phillips curve (There is a negative relationship between the unemployment rate and inflation rate) is ineffective to find a causal relationship between inflation and the unemployment rate in China. However, in

the Nepalese context, there is a negative relationship between the unemployment rate and the inflation rate

This study is based on time series analysis of secondary data of 120 observations of four key economic variables during the period of 1990 to 2020. This study has collected the economic data for the analysis from the World Bank, Economic Bulletin published by Nepal Rastra Bank (NRB), economic and financial websites, International Monetary Fund (IMF), Central Bureau of Statistics Nepal, Asian Development Bank (ADB) and other Nepalese journals of economics and Business that we have taken for the sample.

This study hypothesizes that inflation depends on various factors such as unemployment, annual rice production and remittance inflows. Excel, SPSS, and R software were used to analyze the secondary data, which includes descriptive statistics, correlation analysis, and multi regression analysis. This also includes different statistical tests of significance for validation of the model such as t-test, p-value, F-test, and R2.

Following are the major findings of this study based on the analysis of the data:

1. CPI inflation is positively correlated with all explanatory variables except the unemployment rate

2. Foreign exchange rate negatively impacts Nepalese CPI inflation as the beta coefficient is negative, indicating that the higher exchange rate of Nepalese currency with US dollars will lead to higher CPI inflation.

3. Unemployment rate influences CPI inflation negatively as the beta coefficient is negative, indicating that a higher unemployment rate leads to lower CPI inflation.

4. Also, the beta coefficient for remittances is positive and significant with inflation. Therefore, an increase in remittance inflow in the Nepalese economy also increases CPI inflation.

5. There is a negative relationship between the unemployment rate and inflation since the beta coefficient is negative, which indicates that a higher unemployment rate leads to lower inflation. However, the result is not significant.

6. Also, the beta coefficient for annual rice production is positive and significant with inflation. Therefore, an increase in rice production in the agriculture sector in Nepalese increases CPI inflation.

7. Also, the beta coefficient for remittances is positive with inflation. Therefore, an increase in remittance inflow in the Nepalese economy also increases inflation and the relationship is significant.

5.2 Conclusions

The major conclusion of the study on determinants of inflation in the Nepalese economy revealed that annual rice production has a positive relationship with inflation, which indicates that higher rice production will inflation. Similarly, the relationship of Nepalese inflation with the exchange rate with US dollars is also positive, which means depreciation of the national currency leads to an increment in inflation. Moreover, the bank rate influences inflation positively, indicating that the interest rate offered by Nepal Rastra Bank, is the rate of inflation.

However, the unemployment rate has a negative association with inflation, indicating that higher unemployment rates will be inflation. Likewise, there is a positive relationship between worker's remittance and inflation, which implies that an increase in worker's remittance also increases inflation in the Nepalese economy.

5.3 Recommendations

Based on the findings of the study, the following major recommendations have been made:

1. The study revealed that there is a positive relationship between inflation and annual rice production. Therefore, the production of rice should be increased to the purchasing power of farmers.

2. The study observed a positive and significant relationship between inflation and the foreign exchange rate in US dollars. Hence, the government should have to focus on activities that appreciate the national currency.

3. Monetary policy alone is incapable of controlling inflation. It should, therefore, be supplemented by fiscal measures. Fiscal measures are highly effective for controlling government expenditure, personal consumption expenditure, and private and public investment.

4. The results reveal that there is a negative relationship between the unemployment rate and inflation. Therefore, the economy is willing to control inflation.

5. The results suggest a positive and significant impact of remittance on inflation. Since remittances bring an increase in personal income, improving the living standard of the recipients, eventually increasing the demand for consumption goods and thus increasing inflation. Therefore, remittances should be utilized in productive sectors to boost the economy.

References:

Abizadeh, S. & Yousefi, M. (1986). Political parties, deficits and rate of inflation: A comparative study. *Journal of Social, Political and Economic Studies*, *11*, 393-411.

Acosta, P. A., Lartey, E. K. & Mandelman, F. S. (2009). Remittances and the Dutch Disease. *Journal of International Economics*, *79*(1), 102-116.

Adenuga, I. A., Bello, H. T. & Ejumedia, P. E. (2012). Is inflation a purely monetary phenomenon? Empirical investigation from Nigeria. *European Scientific Journal*, *8*(17), 1970-2009.

Adetiloye, K. A. (2010). Exchange rates and the consumer price index in Nigeria: a causality approach. *Journal of Emerging Trends in Economics and Management Sciences*, *1*(2), 114-120.

Aguiar, A. & Martins, M. M. (2005). Testing the significance and the non-linearity of the Phillips trade-off in the Euro area. *Empirical Economics*, *30*(3), 665-691.

Akcay, O. C. & Alper, C. E. S. (1996). Budget deficit, money supply and inflation: Evidence from low and high frequency data for Turkey. *Bogazici University Research Paper*, 96-112.

Ali, M. S. B. & Mim, S. B. (2011). Determinants of inflation for a sample of 8 MINA countries *International journal of economics and finance*, *3*(4), 119-129.

Arif, K. M. & Ali, M. M. (2012). Determinants of inflation in Bangladesh: An empirical investigation. *Journal of Economics and Sustainable Development*, *3*(12), 9-12.

Balderas, J. U. & Nath, H. K. (2008). Inflation and relative price

variability in Mexico: The role of remittances. Journal of Applied Economics, *15*, 181-185.

Bamidele, T. B. & Joseph, A. I. (2014). Inflation and money supply in Nigeria. *Journal of Business and Organizational Development*, *6*(1), 29-44.

Barro, R. J. (1974). Are government bonds net wealth? *Journal of Political Economy*, *82*, 1095-1117.

Barro, R. J. (2013). Inflation and economic growth. *Analysis of economics and finance*, *14*(1), 85-109.

Barsky, R. & DeLong, B. (1991). Forecasting pre-World War I inflation: The Fisher effect and the gold standard, *Quarterly Journal of Economics*, *106*(3), 815-836.

Barsky, R. B. (1987). The fisher hypothesis and the forecast ability and persistence of inflation, *Journal of Monetary Economics*, *19*, 3-24.

Bhusal, T. P. & Silpakar, S. (2011). Growth and inflation: Estimation of threshold point for Nepal. *Economic Journal of* Development, *1*(13), 131-138.

Boothe, P. & Glassman, D. (1987). The statistical distribution of exchange rates: Empirical evidence and economic implications. *Journal of international economics*, *22*(3), 297-319.

Boschen, J. & Weise, C. (2003). What start inflation: Evidence from the OECD countries? *Journal of Money, Credit and Banking*, *35*, 324-349.

Bugamelli, M. & Paterno, F. (2009). Do workers' remittances reduce the probability of current account reversals? *World Development*,

37(12), 1821-1838.

Callen, T. & Changl, D. (1999). Modeling and forecasting inflation in India. *IMF Working Paper*, 99, 1-36.

ChihChuan Y. (2009). The simultaneous evolution of growth and Inflation. *International Conference on Applied Economics-ICOAE,* 845-854.

Darrat, A. F. (1985). Inflation and federal budget deficits: Some empirical results. *Public Finance Quarterly*, *13*, 206-215.

Darrat, A. F. (2000). Are budget deficits inflationary? A reconsideration of the evidence. *Applied Economics*, *7*(10), 633-636.

David, U. & Ann, T. N. (2014). Causality dynamics between money supply and inflation in Nigeria: A toda-yamamoto test and error correction analysis. *Journal of Empirical Economics*, *3*(2), 63-75.

Domac I. & Carlos E. (1998). The main determinant of inflation in Albania. *World Bank Policy Research Working Paper 1930*.

Edwards, S. & Tabellini, G. (1991). Explaning fiscal policies and inflation in developing countries. *Journal of International Money and Finance*, *10*, 16-48.

Enu, P., Dodzi, E. & Havi K. (2014). Macroeconomic determinants of inflation in Ghana: A co integration approach. *International Journal of Academic Research in Business and Social Sciences*, *4*(7), 95-110.

Faria, J. R. & Carneiro F. G. (2001). Does high inflation affect growth in the long-run and short-run? *Journal of Applied Economics*, *4*(1), 89-105.

Fischer, S. (1993). The role of macroeconomic factors in growth.

NBER Working Paper, *4565*.

Flemming, J. S. (1976). Inflation. *Oxford University Press*, *136*, 3-25.

Friedman, B. M. 1968. The role of monetary policy. *The American Economic Review*. *58*(1).

Friedman, M. & Schwartz, A. J. (1970). Monetary statistics in the U.S. estimates, sources, method. New York: *National Bureau of Economic Research (NBER)*.

Ghazali, N.A. (2003). A long money test of the long-run Fisher effect in the G7 Countries, *Applied Financial Economics*, *13*, 763-769.

Ghosh, A. & Phillips, S. (1998). Warning: Inflation may be harmful to your growth. *IMF Staff Papers*, *45*(4), 23-45.

Ginting, E. (2007). Is inflation in India an attractor of inflation in Nepal? *IMF Working Papers*, 07, 1-30.

Gomme, P. (1993). Money and growth revisited: Measuring the costs of inflation in an endogenous growth model. *Journal of Monetary Economics*, *32*, 51-77.

Goodfriend, M. & McCallum, B. T. (2007). Banking and interest rates in monetary policy analysis: A quantitative exploration. *Journal of Monetary Economics*, *54*(5), 1480-1507.

Gordon, R. J. (1988). The role of wages in the inflation process. *The American Economic Review*, *6*, 276-283.

Guess, G. & Koford, K. (1984). Inflation, recession and the federal budget deficit (or, Blaming economic problems on a statistical

mirage). *Policy Sciences*, *17*, (385-402).

Gul, E. & Ekinci, A. (2006). The causal relationship between nominal interest rates and inflation: The case of Turkey. *Scientific Journal of Administrative Development*, *4*, 54-69.

Hanish, C.L. (2005). The irrationality of rational expectations: An exploration into economic fallacy. *Warwick University Press, UK: 1st Edition*.

Hassler, U. & Neugart, M. (2003). Inflation-unemployment tradeoff and regional labor market data. *Empirical Economics*, *28*(2), 321-334.

Hodge, D. (2002). Inflation versus unemployment in South Africa: Is there a trade-off? *South African Journal of Economics*, *70*(3), 193-204.

Hossain, A. A. (2010). Monetary targeting for price stability in Bangladesh: How stable is its money demand function and the linkage between money supply growth and inflation. *Journal of Asian Economics*, *21*, 564-578.

Huizinga, J. & Mishkin, F.S. (1984). Inflation and real interest rates on assets with different risk characteristics, Journal *of Finance*, *43*, 699-714.

Imimole, B. & Enoma, A. (2011). Exchange rate depreciation and inflation in Nigeria (1986-2008). *Business and Economics Journal*, *28*, 1-11.

Iqbal, J., Nosheen, M. & Javed, A. (2013). The nexus between foreign remittances and inflation: Evidence from Pakistan. *Pakistan Journal of Social Sciences (PJSS)*, *33*(2), 331-342.

Jaradat, M. A. & AI-Hhosban, S. A. (2014). Relationship and causality between interest rate and inflation rate: Case of Jordan. *Interdisciplinary Journal of Contemporary Research in Business*, *6*(4), 54-65.

John, R. M. (2003). Inflation in India: An analysis using post liberalized data. *IGIDR Working Paper*.

Kamal, K. M. M. (2015). Change in inflation dynamics with the level of economic development: A comparative study for open economy. *American Journal of Economics, Finance and Management*, *1*(6), 586-593.

Kamas, L. (1995). Monetary policy and inflation under the crawling peg: Some evidence from VARs for Colombia. *Journal of Development Economics*, *46*(1), 145-161.

Kandil, M. (2005). Money, interest and prices: Some international evidence, *International Review of Economics and Finance*, *14*, 129-147.

Karanassou, M. & Sala, H. (2010). The US inflation-unemployment trade-off revisited: New evidence for policy-making. *Journal of Policy Modeling*, *32*(6), 758-777.

Karras, G. (1994). Macroeconomic effects on budget deficits: Further international evidence. *Journal of International Money and Finance*, *13*, 190-210.

Katria, S., Bhutto, N. A., Butt, F., Domki, A. A., Khawaja, H. A. & Khalid, J. (2011). Trade off between inflation and unemployment. *International Conference on Business* Management, 1-18.

Katseli, L. & Glytsos, N. (1986). Theoretical and empirical

determinants of international labor mobility: A Greek-German perspective. *Central for Economic Policy Research: Working paper 148*.

Khan, J. S. & Islam, S. (2013). The effects of remittances on inflation: Evidence from Bangladesh. Journal of Economics and Business Research, *19*(2), 198-208.

Khattak, N. R. & Tariq, M. (2012). A Real Exchange Rate based Phillips Curve Model for Pakistan. *International Journal of Business and Social Science*, *3*(5), 112-123.

Kumar, R. (2013). A study of inflation dynamics in India: A cointegrated autoregressive approach. *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*, *8*(1), 65-72.

Leduc, S. & Sill, K. (2004). A quantitative analysis of oil-price shocks, systematic monetary policy and economic downturns. *Journal of Monetary Economics*, *51*(4), 781-808.

Lim, Y. C. & Sek, S. K. (2015). An examination on the determinants of inflation. *Journal of Economics, Business and Management*, *3*(7), 678-682.

Madesha, W., Chidoko, C. & Zivanomoyo, J. (2013). Empirical test of the relationship between exchange rate and inflation in Zimbabwe. *Journal of Economics and Sustainable Development*, *4*(1), 52-58.

Malik, W. S. & Khawaja, M. I. (2006). Money, output and inflation: Evidence from Pakistan. *The Pakistan Development Review*, *12*, 1277-1286.

Mallik, G. & Chowdhury, A. (2001). Inflation and economic growth:

Evidence from South-Asian countries. *Asian Pacific Development Journal*, *8*(1), 87-102.

McCandless, G. T. & Weber, W. E. (1995). Some monetary facts. *Federal Reserve Bank of Minneapolis Quarterly Review*, *19*(3), 2-11.

McConnel, C. R. & Brue, S. L. (2007). Economics: Principals, problems and policies. *16th Edition*.

Meltzer, A. H. (1989). Monetarist. *National Review*, *41*, 47-48.

Metin, K. (1995). An integrated analysis of Turkish inflation. *Oxford Bulletin of Economics and Statistics*, 57, 513-533.

Mishkin, F. S. (1992). Is the Fisher effect for real?: A reexamination of the relationship between inflation and interest rates. *Journal of Monetary economics*, *30*(2), 195-215.

Mohammad, R. & Pahlavani M. (2009). Sources of inflation in Iran: An application of the ARDL approach. *International Journal of Applied Econometrics and Quantitative Studies*, *6*(1), 61-76.

Mohseni Z., Hashemi P. M. & Faraji, N. (2011). The relationship between budget deficit and inflation in Iran. *Iranian Economic Review*, *15*(28), 117-133.

Moroney, J. R. (2002). Money growth, output growth and inflation: Estimation of a modern quantity theory. *Southern Economic Journal*, *69*(2), 398-413.

Mughal, M. Y. (2013). Remittances as development strategy: Stepping stones or slippery slope? *Journal of International Development*, *25*(4), 583-595.

Musa, Y., Usman, U. & Zoramawa, A. B. (2014) Relationship

between money supply and government revenues in Nigeria. *CBN Journal of Applied Statistics*, *5*(2), 117-136.

Narayan, P.K., Narayan, S. & Mishra, S. (2011). Do remittances induce inflation? Fresh evidence from developing countries. *Southern Economic Journal*, *77*(4), 914-933.

Nassar, K. B. (2005). Money demand and inflation in Madagascar. *IMF Working Paper, 5*.

Nath, H. K. & Vargas-Silva, C. (2012). Remittances and relative prices. *Review of Development Economics*, *16*(1), 45-61.

Nelson, C.R. & Schwert, G.W. (1977). Short-term interest rates as predictors of inflation on testing the hypothesis that the real rate of interest is constant. *American Economic Review*, *67*(3), 478-486.

NRB Research Department (2001). Money and price relationship in Nepal: A revisit. *NRB Economic Review*, *13*, 50-65.

Odedokun, M. O. (1995). Analysis of probability of external debt rescheduling in Sub-Saharan Africa. *Scottish Journal of Political Economy*, *42*(1), 82-98.

Oomes, N. & Ohnsorge, F. (2005). Money demand and inflation in dollarized economies: The case of Russia. *Journal of Comparative Economies*, *33*, 462-483.

Pahlavani, M. & R. Mohammad, R. (2009). Sources of inflation in Iran: Application of the ARDL Approach. *International Journal of Applied Econometrics and Quantitative Studies*, *6*, 61-76.

Patnaik, A. (2010). Study of Inflation in India: A cointegrated vector autoregression approach. *Journal of Quantitative Economics*, *8*(1), 118-129.

Paudyal, S. (2013). Do budget deficits raise interest rates in Nepal? *NRB Economic* Review, *25*(1), 51-66.

Paudyal, S. (2014). Determinants of inflation in Nepal: An empirical assessment. *NRB Economic* Review, *26*(2), 61-82.

Pelipas, I. (2006). Money demand and inflation in Belarus: Evidence from cointegrated VAR. *Research in International Business and Finance*, *20*(2), 200-214.

Phillips, A. W. (1958). The Relation between unemployment and the rate of change of money wage rates in the United Kingdom .*Economica*, *25*(100), 283-299.

Rana, P. B. & Dowling Jr, J. M. (1985). Inflationary effects of small but continuous changes in effective exchange rates: Nine Asian LDCs. *The Review of Economics and Statistics*, *1*, 496-500.

Rao, N., Reddy, P. C., Mahaboob, A. M., Srinivasulu, P. & Pranav, K. S. (2013). A study on inflation in India. *International Research Journal of Social Sciences*, *2*(12), 51-55.

Ribba, A. (2006). The joint dynamics of inflation, unemployment and interest rate in the United States since 1980. *Empirical Economics*, *31*(2), 497-511.

Rodrik, D. (2008). The real exchange rate and economic growth. *Brookings Papers on Economic Activities*, *2008*(2), 365-412.

Rowthorn, R. E. (1977). Conflict, inflation and money. *Cambridge journal of Economics*, *1*(3), 215-239.

Sarel, M (1996). Nonlinear effects of inflation on economic growth. *IMF Staff Papers*, *43*, 199-215.

Sek, S. K. & Ooi, C. P. (2012). Investigating the relationship between exchange rate and inflation targeting. *Applied Mathematical Sciences*, *6*(32), 1571-1583.

Simwaka, K., Ligoya, P., Kabango, G. & Chikonda, M. (2012). Money supply and inflation in Malawi: An econometric investigation. *Journal of Economics and International Finance*, *4*(2), 36-48.

Smyth, D. J. (1994). Inflation and growth. *Journal of Macroeconomics*, *1*(16), 261-270.

Solomon, M. & De Wet, W.A. (2004). The effect of a budget deficit on inflation: The case of Tanzania. *South Africa Journal of Economic and Management (SAJEMS)*, *7*(1), 100-106.

Sowa, N. K. (1994). Fiscal deficits, output growth and inflation targets in Ghana. *World Development*, *22*, 1105-1117.

Srinivasan, N., Mahambare, V. & Ramachandran, M. (2006). Modelling inflation in India: A critique of the structural approach. *Journal of Quantitative Economics*, *4*(2), 45-59.

Sullivan, A. & Sheffrin, S.M. (2003). Economics: Principles in action. *Pearson Prentice Hall: 2nd Edition*, 341.

Tang, C. F. & Lean, H. H. (2007). Is the Phillips curve stable for Malaysia? New empirical evidence. *Malaysian Journal of Economic Studies*, *44*(2), 95-103.

Teker, D., Alp, E. A. & Kent, O. (2012). Long-run relation between interest rates and inflation: Evidence from Turkey. *Journal of Applied Finance & Banking*, *2*(6), 41-54.

Thapa, R. B. (2010). Determinants of inflation in Nepal. *PYC Nepal*

Journal of Management, *3*(1), 172-180.

Vuyyuri, S. & Sethaiah, S.V. (2004). Budget deficits and other macroeconomic variables in India. *Applied Econometrics and International Journal, 4*(1), 37-54.

Wennerlind, C. (2005). David Hume's monetary theory revisited, *Journal of Political Economy*, *113*(1), 233－237.

Xie, C., Tang, H. & Cui, Y. (2009). Money supply, economic growth and inflation of China. *Computational Sciences and Optimization, 2009, International Joint Conference on* IEEE, *2*, 562-566.

Yasmin, F., Bibi, S., Atta, S. & Javed, M. (2013). Money supply, government borrowing and inflation nexus: Case of Pakistan. *Middle-East Journal of Scientific Research*, *18*(8), 1184-1191.

Cheng, M. and Tan, H. (2002), "Inflation in Malaysia", International Journal of Social Economics, Vol. 29 No. 5, pp. 411-425. https://doi.org/10.1108/03068290210423532

Husain, A. O. (2007). Determinants of Inflation in Kuwait. Journal of Economic and Administrative Sciences, 23(2), 1-13.

Pitchford, J. (2002). *The current account and foreign debt*. Routledge.

Phillips, A. W. (1958). "The Relation Between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861－1957", Economica, London School of Economics and Political Science, vol. 25(100), pages 283-299, November.

Shrestha, M. B., & Chaudhary, S. K. (2012). The impact of food inflation on poverty in Nepal. NRB Economic Review, 24(2), 1-14.

Phillips, A. W. (1958). "The Relation Between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861－1957", Economica, London School of Economics and Political Science, vol. 25(100), pages 283-299, November.

Gairhe, S., Gauchan, D., & Timsina, K. P. (2021). Temporal Dynamics of Rice Production and Import in Nepal. Journal of Nepal Agricultural Research Council, 7(1), 97－108.

Inyiama, O. I., & Ekwe, M. C. (2014). Exchange rate and inflationary rate: Do they interact? Evidence from Nigeria. *International journal of economics and finance*, *6*(3), 80-87.

Bhutto, M. (2011). Empirical Relationship of Exchange Rate with Inflation, International Trade and Gross Domestic Product (GDP) in Pakistan's Economy. *NICE Research Journal*, 171-182.

Chattopadhyay, M., & Mitra, S. K. (2018). Assessing the predictability of different kinds of models in estimating impacts of climatic factors on food grain availability in India. *Opsearch*, *55*(1), 50-64.

Gomme, P. (1993). Money and growth revisited: Measuring the costs of inflation in an endogenous growth model. Journal of Monetary Economics, 32, 51-77.

Valera, H. G., Balié, J., & Magrini, E. (2021). Is rice price a major source of inflation in the Philippines? A panel data analysis. Applied Economics Letters, 1-5.

Friedman, M., & Schwartz, A. J. (1970). *Monetary statistics of the United States: Estimates, sources, methods* (No. 20). New York: National Bureau of Economic Research.

NRB Research Department (2010). Money and price relationship in Nepal: A revisit. *NRB Economic Review*, *13*, 50-65.

Yatsenko, H. (2020). The Impact of Weather Conditions on Economic Activity in Ukraine. *Visnyk of the National Bank of Ukraine*, (249), 25-49.

Blagrave, P. (2020). Inflation co-movement in emerging and developing Asia: the monsoon effect. *Applied Economics Letters*, *27*(15), 1277-1283.

Bank, N. R. (2021). Current macroeconomic and financial situation of Nepal. *Kathmandu: Nepal Rastra Bank*.

Paudyal, S. (2014). Determinants of inflation in Nepal: An empirical assessment. *NRB Economic* Review, *26*(2), 61-82.

Ebiringa OT, Anyaogu NB (2014) Exchange rate, inflation and interest rates relationshipsMughal, M. Y. (2013).

Remittances as development strategy: Stepping stones or slippery slope? *Journal of International Development*, *25*(4), 583-595.

Rodrik, D. (2008). The real exchange rate and economic growth. *Brookings Papers on Economic Activities*, *2008*(2), 365-412.

Adetiloye, K. A. (2010). Exchange rates and the consumer price index in Nigeria: a causality approach. *Journal of Emerging Trends in Economics and Management Sciences*, *1*(2), 114-120.

Khattak, N. R. & Tariq, M. (2012). A Real Exchange Rate based Phillips Curve Model for Pakistan. *International Journal of Business and Social Science*, *3*(5), 112-123.

NRB Research Department (2021). Economic Survey 2021-Post Covid. *NRB Economic Review*, *13*, 50-65.

Nath, H. K. & Vargas-Silva, C. (2012). Remittances and relative prices. *Review of Development Economics*, *16*(1), 45-61.

Khan, M.K., Teng, JZ. & Khan, M.I. Cointegration between macroeconomic factors and the exchange rate USD/CNY. *Financ Innov* **5,** 5 (2019). https://doi.org/10.1186/s40854-018-0117-x

국 문 초 록

- 네팔 경제의 인플레이션 영향요인에 관한 연구 -

한 성 대 학 교 대 학 원
국 제 무 역 경 제 학 과
국 제 무 역 시 장 전 공
삼 자 나

인플레이션은 항상 그리고 어디에서나 통화 현상이고 그것은 거시경제학에서 흥미롭게도 민감한 문제이다. 전 세계적으로 정책입안자와 학계 사이에서 가장 많이 논의되는 사안이다. 그 영향이 광범위하고 심각하며 그 영향이 멀리까지 미치고 있기 때문이다. 이 연구에는 1990-2020 년 기간 동안 선택된 거시경제 변수와 네팔 인플레이션과의 관계에 대한 포괄적인 분석 전망이 포함되어 있다. 게다가, 인플레이션 문제는 많은 요소들을 포함하고 있기 때문에 여전히 논쟁거리가 되고 있어서, 더 많은 최신 정보가 필요하다. 이 연구는 쌀 생산과 같은 새로운 변수로 그러한 정보를 업데이트하기 위해 엄격한 분석을 했다. 이 연구는 송금; 연간 쌀 생산과 변동 환율의 통제가 인플레이션과 긍정적인 관계를 가지고 있다는 것을 발견했다. 게다가, 이 연구는 정책 입안자들이 네팔 경제의 추가적인 경제 안정에 대한 인플레이션의 영향을 이해하기 위해 그들의 발견과 결정을 더 적절하고, 구조적이며, 측정 가능한 방식으로 개발해야 한다는 것을 시사한다.

키워드: [인플레이션, 송금, 환율, 네팔 경제, 쌀 생산, 실업률]